

**R546
INSTRUCTIONAL
STRATEGIES
FOR
THINKING
COLLABORATION
AND
MOTIVATION**

Instructor: Curt Bonk

R546 Instructional Strategies for Thinking, Collaboration, and Motivation

Curt Bonk

Organization of Best of Bonk (BOB) Handouts:

- 1. Syllabus and Resources**
- 2. General Learning Theory and Student Engagement Literature**
- 3. Motivational Theory, Principles, and Techniques**
- 4. Creative Thinking: Techniques, Methods, and Assessments**
- 5. Critical Thinking: Techniques, Methods, and Assessments**
- 6. Cooperative Learning Generic: Theory, Principles, and Techniques**
- 7. Cooperative Learning Specific Techniques: Reading, Writing, Math, Science, etc.**
- 8. Applicable Assessment Techniques**
- 9. Recap and Review**
- 10. Good and Bad Teaching**

“Some say that my teaching is nonsense. Others call it lofty but impractical. But to those who have looked inside themselves, this nonsense makes perfect sense. And to those who put it into practice, this loftiness has roots that go deep.”

Lao-tzu, “Tao-te-ching,” 6th Century B.C., China

Fall 2019, R546 Instructional Strategies for Thinking, Collaboration, and Motivation

Canvas: <http://canvas.iu.edu/>; **R546:** <https://iu.instructure.com/courses/1821861>

Old Course Website: <http://www.indiana.edu/~bobweb/>; **Dropbox Resources**

HTML of Syllabus: <http://curtbonk.com/Instructional-Strats-R546-2019.htm>

Dates: August 26, 2019 to October 14, 2019 (Mondays, 4:00 pm--9:45 pm), IU-B

IU-Bloomington: Section 8928, School of Education: Room 2275 (IUB)

Zoom Videoconferencing: <https://IU.zoom.us/j/8123222878>

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Course Description: Students in this course will learn how to develop learning environments that stimulate critical thinking and creativity, and that promote cooperative learning and motivation. In addition, they will learn technology integration strategies. To highlight method similarities and differences and to link theory to practice in each area, scientifically researched strategies and programs will be illustrated through hands-on activities. There is much experimentation and risk taking in this class. Everyone will learn dozens of instructional strategies; but, more importantly, they will reflect on their overall teaching philosophy.

Course History and Intended Audience:

Educators in all sectors are struggling with wave after wave of educational change. Many recognize the need for shifting their teaching philosophy to a more learner-centered or hands-on approach. This trend is especially evident here in 2018; the age of STEM, competency-based education, personalized instruction, problem-based learning, digital learning, Wikipedia, TED-Ed, and MOOCs. Today, learners can be more self-directed. However, learners often lack sufficient time and resources. In response, this course provides a roadmap for those stuck in the murky swamp of paradigm change and educational reform. Different versions of this course have been taught since 1991, with videoconferencing added in 1996. Past course participants have also included graduate students, corporate trainers, instructional designers, administrators, and private consultants. This course is intended for:

- Graduate students wanting to feel better prepared to teach, train, or learn something new.
- Corporate trainers wanting to embed practical strategies into their training workshops and classes.
- Higher education professors wanting to enhance their instruction with innovative teaching.
- Instructional designers interested in embedding thinking skills into software and other media.
- K-12 principals and other administrators hoping to integrate various educational reform efforts.
- Practicing teachers searching for professional development opportunities for engaging learners.
- Private consultants offering thinking skill or problem solving workshops or training.
- Visiting scholars, Fulbright scholars, and other visiting guests who want to make a difference.

Required Material: Bonk, C. J. (2019). *Packet of Course Handouts*. (available **FREE as a PDF** in Dropbox)

Bonk, C. J., & Khoo, E. (2014). *Adding Some TEC-VARIETY: 100+ Activities for Motivating and Retaining Online Learners*. **Note: this is a FREE e-book:** <http://tec-variety.com/>; <http://tec-variety.com/freestuff.php>

Highly Rec'd Texts:

1. Gary A. Davis (2004). *Creativity is Forever (5th Ed)*. Dubuque, Iowa: Kendall/Hunt.
2. Sawyer, Keith (2013). *Zig Zag: The Surprising Path to Greater Creativity*. Jossey-Bass.
3. Bonk, C. J., & Zhang, K. (2008). *Empowering Online Learning: 100+ Activities for R2D2*. Jossey-Bass.

Book Book Library: I have an extensive set of books on motivation, critical and creative thinking, collaborative and cooperative learning which I am happy to loan out. I will try to bring many of these to class each week.

Course Purpose, Approach, and Education 3.0 (or perhaps even Education 4.0):

Since the early 1980's, countless reports have detailed the shift toward an information-based economy and the need for a more technologically sophisticated workforce. Life in 2019 is much different from 1984. The skills and experiences required to succeed today are vastly different from three decades ago. A modern-day workforce clearly demands skills such as creativity, flexibility in thought, the ability to make decisions based upon incomplete information, complex pattern recognition abilities, and synthesis skills. Such changes are occurring faster than most of organizations and institutions can adapt. They are also accelerating massive transformations in teaching and learning environments across sectors of education.

In response to the emerging global marketplace, there has been a renewed interest in innovation and creativity. It does not matter if one is in a public school or higher education setting or in a military and corporate training environment. The shift in perspective is the same. Everyone is seeking the Holy Grail and become more inventive and productive than the next person or organization. Some are labeling this new age "Education 3.0." The markers of this time are tinkering, making things, invention, connection, freedom, imagination, play, collaboration, engagement, passion and purpose, finding meaning, and the open exchange of ideas. Consequently, this class will begin with a dialogue of what Education 3.0 represents. Each student will find his or her own sense of meaning or philosophy in this course.

In Education 3.0, people will no longer tolerate a curriculum that emphasizes the rote memorization of facts over problem solving and creativity. Instead, innovative instructors and trainers engage learners with more authentic and active learning experiences. Even with such renewed interest and resources, most teachers still lack the time and resources to adequately deal with the proliferation of instructional practices and associated ideas regarding educational change. This course—R546 on instructional strategies—can change all that for you. The basic purpose of this course, therefore, is to attempt to fuse motivation and cooperative learning to thinking skill areas such as critical and creative thinking.

The books and activities selected will enable us to understand coinciding trends in education related to creative thinking, critical thinking, motivation, and cooperative learning. In starting on this path, specific techniques and ideas will be offered as well as implementation steps. Demonstrations and hands-on experiences of various methods will be used to highlight method similarities and differences. In addition, students will be exposed to ways to use technology to increase student thinking skills and teamwork. Finally, advice will be offered for getting started using these alternative instructional strategies.

Course Objectives:

As a result of this course, participants will:

- Understand the commonalities and differences of creative and critical thinking;
- Feel comfortable using dozens of motivational strategies and instructional techniques;
- List thinking skill options for different types of learners and content areas;
- Design innovative thinking skill activities as well as unique cooperative learning methods.
- Develop a personal synthesis and perspective on instructional strategies and pedagogy.

During the course, enrolled students will be expected to:

- Complete the required readings and actively participate in course activities;
- Write and reflect on the subject matter;
- Search for and share additional resources beyond the course materials provided;
- Develop and share curriculum materials and course plans.

Weekly Modules and Course Sequence

- Week 1. Aug 26 **Education 3.0 and Strategy Review/Recap (R2D2 and TEC-VARIETY)**
Week 2. Sept 2 **Coop Learning Methods/Principles & Flipping the Class** (Read a creativity book)
Week 3. Sept 9 **Critical Thinking Defined and Explained** (Continue reading creativity book)
Week 4. Sept 16 **Critical Thinking Methods** (Read 2nd book) (**Due:** 2 papers from Task #2)
Week 5. Sept 23 **Creative Thinking Defined and Explained** (take pics during week doing creative tasks)
Week 6. Sept 30 **Creative Thinking Methods** (Share pics of you being creative in prior week)
Week 7. Oct 7 **Motivation Defined and Explained** (Read third book or a special journal issue)
Week 8. Oct 14 **Motivation Theory and Techniques** (**Due:** Final papers and Presentations)

Note #1 on Readings: During Weeks 1-3, I want everyone to read a creativity book. I recommend Keith Sawyer's Zig Zag book or Gary Davis' *Creativity is Forever* book (buy used). During Weeks 4-7, students are to read two 2 additional books or one book and one special journal issue (as approved by the instructor). I want you to read books in critical thinking, creativity, cooperative learning, motivation, or problem solving. For doctoral students, at least one of these books or special journal issues should be research related. Some recommend books are listed below. I will bring these and many more to class.

Note #2 on Collaboration and Teaming on Assignments: Students are allowed to work in teams on any paper or project but the length of such papers or presentations are, in effect, double/twice the length.

Note #3 on Lateness Policy: Assignments have a 96 hour (i.e., 4 day) grace period with no penalty.

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Grades and Due Date:

Task	Grades	Due date
Participation	30	N/A (due each week)
Reflection and Personal Exploration Activity1	30	Sep 16 (+4 days grace)
Reflection and Personal Exploration Activity2	30	Sep. 16 (+4 days grace)
Reflection and Personal Exploration Activity3	30	Oct. 14 (+4 days grace)
Final project	60	Oct. 14 (+4 days grace)
Total Points	180	

Grading Scale: I will use a 90-80-70-60 scale based on 180 total points.

168 pts = A; 162 = A-; 156 = B+; 150 = B; 144 = B-; 138 = C+; 132 = C; 126 = C-

Sample of Course Related Books:

Creativity, Thinking, and Innovation Books

1. Anderson, Chris (2012). *Makers: The New Industrial Revolution*. NY: Crown Business.
2. Catmull, Ed (2014). *Creativity, Inc.: Overcoming Unseen Forces in Way of Inspiration*. Random H.
3. Davidson, Cathy (2017). *The New Education: How to Revolutionize the University*. Basic Books.
4. de Bono, E. (2004). *How to have a beautiful mind*. Vermillion. (or *Lateral Thinking* from 1990).
5. Dweck, Carol (2006). *Mindset: The New Psychology of Success*. Random House.
6. Grant, Adam (2016). *Originals: How Non-Conformists Move the World*. Viking.
7. Kaufman, S. B. & Gregoire, C. (2015). *Wired to Create: Unraveling Mysteries of Creative Mind*.
8. Lehmann, Chris, & Chase, Z. (2015). *Building School 2.0: How to Create the Schools We Need*.
9. Martinez & Stager (2013). *Invent to Learn: Making, Tinkering, & Engineering in the Classroom*.
10. McLagan, Patricia (2017). *Unstoppable You: Adopt the New Learning 4.0 Mindset*. ATD Press.

11. Michalko, M. (2006). *Tinkertoys: A handbook of creative-think tech* (2nd ed). Ten Speed Press.
12. Mueller, Jennifer (2017). *Creative Change: Why We Resist It...How We Can Embrace It*. HMH.
13. Pink, Daniel (2009). *Drive: The Surprising Truth About What Motivates Us*. Riverhead Books.
14. Robinson, Sir Ken (2013). *Finding Your Element: How to Discover Your Talents and Passions*.
15. Robinson, Sir Ken (2015). *Creative Schools: The Grassroots Revolution That's Transforming Ed*.
16. Sawyer, Keith (2013). *Zig Zag: The Surprising Path to Greater Creativity*. Jossey-Bass.
17. von Oech, Roger (2002). *Expect the unexpected (or you won't find it)*. Berrett-Koehler Publishers.
18. Wagner, T. (2012). *Creating Innovators: Making of Young People Who Change World*. Scribner.
19. Wagner, T. & Dintersmith, T. (2015). *Most Likely to Succeed: Preparing Kids for Innovation Era*.
20. Zhao, Yong (2012). *World Class Learners: Educating Creative and Entrepreneurial Students*.

Motivation and Adult Learning Books:

1. Baumeister, R., & Tierney, J. (2011). *Willpower: Rediscovering the Greatest Human Strength*. Penguin
2. Barkley, Cross, & Major (2005). *Collab lrng tech: A Handbook for College Faculty*. Jossey-Bass.
3. Brookfield S. (2012). *Teaching for Critical Thinking: Tools/Tech to Help Students Q Assumptions*.
4. Brookfield, S. (2013). *Powerful Techniques for Teaching Adults*. Jossey-Bass/Wiley.
5. Dabbaugh, Marra, & Howland (2019). *Meaningful Online Learning: Integ. Strats*. NY: Routledge.
6. Ferlazzo, Larry (2013). *Self-Driven Learning: Strategies for Student Motivation*.
7. Major, Harris, & Zakrajsek (2016). *Teaching for Learning: 101 Designed Ed Activities*. Routledge
8. McCombs, B. L., & Pope, J. E. (1994). *Motivating hard to reach students*. DC: APA.
9. Perkins, David (2009). *Making Learning Whole: How 7 Principles of Teaching Can Transform Ed*.
10. Reeve, J. (1996). *Motivating others: Nurturing inner motivational resources*. Allyn and Bacon.
11. Salmon, G. (2013). *e-tivities: The key to active online learning (2nd Ed)*. London: Kogan-Page.
12. Sharples, M. (2019). *Practical Pedagogy: 40 new ways to teach and learn*. NY: Routledge.

Class Activities: (I) Class Participation; (II) Reflection and Personal Exploration Activities; and (III) Final Project

Task #I. Class participation and attendance (30 points). I will note attendance and participation each week in this class. In addition, anyone has a chance to present an instructional idea during the first or last 5 or 10 minutes of class time. Let me know if you are interested.

Task #II. Reflection and Personal Exploration Activity Options (90 Points--Pick any 3):

Note: Two of these tasks are due September 16 (Week 4 meeting) and the other one is due October 14 (Week 8 meeting). Examples of some of these tasks can be found at the Bobweb Web site. These tasks have been designed for you to go deeper into a theory, theorist, topic, concept, strategic approach, or issue. I want you to become a budding expert on some aspect of this course. See grace period (96 hours) above.

Option A. Curriculum Brainstorm (30 points)

In this option, I want you to spend 1-3 hours all alone brainstorming (perhaps in a closet with a flashlight) all the possible ways you could use critical and creative thinking and motivational techniques and cooperative learning in your job setting (page 1). After attending a few classes, you will spend more time personally ranking these ideas and reconfiguring your original 3-4 lists. For example, you might sort your ideas into categories or prioritizations that are useful to you this coming year (page 2). Next, I want you to reflect and jot down notes on this list and how it changed (page 3—single spaced). On the Bobweb website are examples of good curriculum brainstorms from prior years. I will give feedback on this 3-4-page assignment related to your (1) creative, originality, and insightful ideas, (2) coherent and complete reflection, (3) practical relevance to this class and your future, (4) impact, and related matters. **(This option is HIGHLY RECOMMENDED for practicing or future teachers!)**

Option B. Super Thought Paper (30 points)

The exploratory thought paper allows you to summarize some of the thinking you have been doing as a result of this class or book that you have been reading related to this class. Your super thought piece or book review will be a 2-4 page (single-spaced) exploration and explanation of a thinking skill, motivational strategy, or cooperative learning technique or idea that you have been contemplating or reading about. This is not mindless idea doodling, but, instead, is a way to coherently explore something that "inspires" you at a deep level. Your paper will be assessed for: (1) insightful, creativity, (2) impact, (3) strong logic, flow, and coherence, (3) completeness and depth of thought, and related things.

Option C. One Super Summary Search (30 points)

In the Super Summary Search, you might conduct a library search (preferably online) on a topic within motivation, critical thinking, creative thinking, or cooperative learning that you find important (this must include at least 10 articles (for doctoral students, at least half of these must be research-based articles). For instance, you might be interested in cooperative learning in K-12 classrooms; or, more specifically, cooperative learning in environmental science classrooms. If that is your topic, you would search through the research and practice literature on this topic (let's say for the past 3-5 years) and then create a personal bibliography on this topic for your later use. I would like for you to categorize the articles somehow (e.g., according to research or practice, task, age-groups, domain, time required, etc.). In addition, I would like for you to write a one paragraph summary for about 3-5 of these articles, wherein you summarize the article and discuss its importance to the field and to yourself and your colleagues. You will turn in the following items to me: (1) bibliography of the articles found listed in important categories/topics and (2) 4-5 brief summary abstracts. I will look for the following in your work: 1. completeness and depth, 2. impactfulness of the project, (3) insight and relevancy to class and topic selected, 4. coherent analysis and categorization, and related things. Unless I ask, I do not need copies of any of the articles you select though you might include the first pages of every article.

Option D. Program or Strategy Review (30 points)

Find a method for teaching thinking skills, cooperative learning, or motivation, or a problem solving program or other heavily researched method (e.g., reciprocal teaching, cooperative scripts, etc.) and review or synthesize that approach and its applicability to learners who you currently or someday might teach. What flaws or limitations are apparent? What are the strengths or potential uses of the program? You might ask a teacher how he or she would actually use it in the classroom. You are to turn in a 2-4 page single-spaced review of this program or approach. These papers will be graded for (1) relevance, logic, and organization, (2) completeness and depth, (3) originality, impact, insight, and practicality, and other things.

Option E. Expert or Scholar Review (30 points)

Sometimes an instructional approach or thinking program is synonymous with the inventor or creator of that program. In this option, I want you to review the work of a scholar in this field. For instance, you might read about person who invented a popular instructional technique or series of techniques or who authored a famous book, such as Sir Ken Robinson, Edward De Bono, or David or Roger Johnson from the Cooperative Learning Center. You might send that person (or someone who has developed similar programs or strategies) a letter asking for additional information. For instance, you might want to see what else exists on a topic, find out how teachers are using a thinking skill program, write to competing researchers for research reports, or something similar. It is the exploratory, inquisitive nature of the task that is prized here, not what you actually do. In addition to orally reporting what you found out, you must turn in a 2-4 page single-spaced summary of the work of this person. Be sure to include what you did, why you chose this activity, what you gained from it, any resources received, and a copy of your letter(s). You might place an appendix in the paper outlining that person's life. These papers will be assessed for (1) exploration, (2) relevance, (3) depth, (4) coherence, and other related matters.

Option F. Fulbright Teacher or Visiting Scholar Interview(s) (30 points)

In this option, I want you to interview one or more Fulbright teacher participants from previous years or visiting scholars in this class this year. Ask them how the ideas of this class are carried out in their country or classroom. Just how are they using or planning to use creative thinking, critical thinking, cooperative learning, motivation, and/or technology integration when they return home or how have they incorporated them already? Ask visiting scholar(s) or a Fulbright visitor some questions about what they are learning in this course. How can their use of these approaches be improved? How might they use the ideas of this class in their own classes? How do the respective ideas of this course link together? What is especially beneficial or intriguing about this course? In your 2-4 page single spaced paper, you are to summarize what you found out. You might also make some recommendations to the expert. Your review will be evaluated for: (1) coherence, (2) relevance, (3) completeness/depth, (4) originality of ideas, (5) potential impact, (6) insights. You might include an appendix with the transcript of any interview that you conduct as well as your interview questions.

Option G. Education 3.0 Philosophy Paper (30 points)

In this option, you are to define what the Education 3.0 means to you. Please back up your claims with 5-10 references. I also want you to describe your teaching or instructional philosophy. What instructional principles and guidelines do you view as vital? What does an effective learning environment look like in light of this class? Stated another way, what have you learned in this class that has altered or perhaps transformed your philosophy of teaching? Perhaps it entails an emphasis on flipping the classroom? Or perhaps it is allowing learners more time for exploration and creativity. Be sure to list at least ten guiding principles and describe how at least 4 of them would be operationalized. Be sure to turn in a 2-4 page single-spaced paper. These educational philosophy papers will be graded for (1) logic and organization, (2) completeness and depth, (3) originality and insight, (4), impact, (5) relevance and practicality, etc.

Option H. Book or Special Journal Issue Review (30 points)

Review a book or special issue of a journal related to this class (including one of the books you decide to read). It can be a book or special issue that is practical, research-oriented, or theoretical. What are the key points or findings of the book or issue? What are the strengths and weaknesses? What are future trends? How will you apply some of the ideas from this book? You might decide to compare and contrast two books. An option of this would be to write a rebuttal to an existing review or critique as if you were the author. You should turn in a 2-4 page single-spaced review. These papers will be graded for (1) logic and organization, (2) completeness/depth, (3) originality and insight, (4) relevance, (5) practicality, etc. If you do a book review and post a piece of it to Amazon and share the link with me, you can gain 2 bonus points.

Option I. Research Dig (30 points)

Unlike the Super Summary Search which also includes practical articles, in this option, you are to canvass the research literature on a topic related to this class. Perhaps this will lead to a dissertation, master's theses, or research project. You must find at least 15 articles on a topic and read at least half of them. In your paper, you should describe how you found your articles and essentially describe the state of the research? What are the general findings? What are the strengths and weaknesses or limitations? Where are the open issues, questions, or gaps on this topic and how might you research this area? What are future trends? Also, how will you apply some of the ideas from this work? You should turn in a 2-4 page single-spaced review. This will be evaluated for (1) logic and organization, (2) completeness/depth, (3) originality and insight, (4) relevance, (5) practicality, etc.

Option J. Job Application Paper (30 Points)

Here, you are to write a 3 page single-spaced paper where you evaluate one or more perspectives, strategies, or approaches from the perspective of an educational setting, issue, or problem of importance to

you (preferably your current or past job). For example, the paper might be titled, “My life as a cooperative learning teacher in a competitive classroom.” Like all good papers, it should have a descriptive title, some kind of thesis statement, and a conclusion. Since this is not a library research paper, you do not necessarily need to use any references resources other than the text and class discussion. These papers will be graded for (1) demonstration of understanding of the idea or strategy, (2) relevant application of it to some educational setting or context and impact, (3) insights, (4) coherence and organization, (5) completeness.

Option K. Case Situations or Problems (30 Points)

Write 3 case situations or vignettes related to your current or most recent job setting (each will be about one page long single spaced). In these cases, you will point out the situation or problem in 1-2 paragraphs as well as the key questions or issues. Next you will detail the concepts that relate to this class. Finally, you will provide a resolution based on your readings in this class. If anyone shares their cases with co-workers or peers and gets feedback on them, you will get 2 bonus points provided you attach this to your work. Your paper will be graded for: (1) sound solution and overall demonstration of understanding of idea, strategy, perspective, or approach, (2) case richness/detail, (3) coherence and organization of the paper.

Option L. Combination or Extension of Above Options (Note: needs approval) (30 Points)

In this option, you can combine 2 or more of the above options (e.g., a book review and author/expert interview). Please run your combination idea by the instructor first. You might also suggest extending one of the options into a new direction (e.g., a book review or expert interview that you attempt to publish).

Task #III. Final Project Options (Pick one—Due October 14):

Master’s students I recommend Option A below and doc students I recommend Options B, C, or D.

Option A. Presentation/Description of Curriculum Unit or Idea (60 points: this can be team taught)

For master’s students, the key class assignment here is the development of a curriculum idea or unit on critical or creative thinking, motivation, or cooperative learning for a content area that you teach or would like to teach someday. Here, I want you to specify the materials to be learned/studied, targeted age group, learning objectives, instructional plan, time length, method(s) used and procedures, and anticipated assessment procedures (about 4-5 single spaced pages total). Note that the topic of this unit or lesson is up to you. I would ask that you present your curriculum ideas to the class with at least one class handout so that we all benefit from your efforts; the normal time allotment is 8-10 minutes for individuals and 15-20 minutes for teams. During your presentation, you can be as creative as you want to be.

Grading criteria for your curriculum unit presentation and paper include:

1. Organization of the ideas and presentation (logic, flow, length, practiced).
2. Topic stimulation (active engagement of audience).
3. Usefulness of materials (clear, practical, handy, relevant, informative, handout(s) provided).
4. Knowledge of the topic (expertise, good ideas, insights).
5. Scope of plans and curriculum impact (goals clear, important, appropriate, significant, doable).
6. Uniqueness (creative spark, catches attention, has chance to explode, something different).

Typically, presenters are provided with immediate feedback from other students as well as from me. I have collected tons of examples from previous years to share with you--see Bobweb Web site for some of these previous units. For many students, this assignment is typically the highlight of the course!

Option B. Research Proposal on Instructional Strategies or R546 Content

Doctoral students might focus more on research ideas and select Option B. For instance, you might conduct a pilot test of an instructional approach. Alternatively, you might observe and code the teaching techniques used by one instructor or a series of instructors. Or, you might observe a student “think aloud”

as he uses a learning strategy or technique. Instead of that, you might perform action research in a course that you are teaching. For instance, you might try out a cooperative learning, or, more specifically, a cooperative reading technique like reciprocal teaching or cooperative scripts. Please turn in a maximum of 10 single-spaced pages, exclusive of references, appendices, charts, and tables.

Research Proposal should include:

- I. Title Page (Name, affiliation, topic title, acknowledgments) (1 page)
- II. Introduction to Topic/Problem (purpose, history, importance) (1 page)
- III. Review of Literature and research questions/hypotheses (3-5 pages)
- III. Method Section (subjects, context, materials, measures/instruments, procedures, coding (2-3 pages):
- IV. Results and Discussion (OPTIONAL): 1. Antic/dummied results; 2. Discussion of results
- V. References (APA style: see instructor for examples)
- VI. Appendices (figures, instruments, charts, models, coding criteria, pictures of your grandmother, etc.)

Option C. Grant Proposal Related to R546 Content

Perhaps you are working for a center that needs grant money. Here is a chance to help out. After thoroughly reading a topic area related to R546 in some way, draft a proposal for a grant to a government agency or a foundation. You (and your boss) choose the funding agency, title, and monies needed. Include the purpose and goals, ideas, timeline for the project, ramifications or implications, budget, and other items required in the grant. An extensive literature review with associated research questions should ground your proposal, while the names and addresses of 3 reviewers and your resume should end your proposal. Please turn in a maximum of 10 single-spaced pages, exclusive of references, appendices, charts, and tables.

Option D. Teaching and Learning Center (or some other R546 related center) Creation Proposal

Write a proposal to create a teaching and learning center with a focus in an area wherein you are interested. This proposal must be related to R546 content where possible and should include strategies and ideas for critical or creative thinking, cooperative/collaborative learning, motivation, or technology integration. Start with a rationale for the center. Names and ideas related to specific R546 instructional strategies must be highlighted. These proposals can be internally written such as to a university or school district or externally written such as to a government agency or foundation. Include a rationale and purpose for center in your proposal as well as goals or targeted plans, strategies that you hope to implement (very important) and how you might train for them, a timeline, a budget, stakeholders, space needed, resource needs, etc. Please turn in a maximum of 10 single-spaced pages, exclusive of references, appendices, charts, figures, and tables. Be specific, practical, unique, and inspiring in your design. This is a particular hard option to provide specifics. Be careful. A general overview will **not** suffice. If you select it, please be creative!

Grading Scale from Options B, C, or D (Note 1 (low) to 10 (high) for each of the following criteria):

1. Review of the Problem, Issue, and Literature (interesting, relevant, current, organized, thorough)
2. Relevancy (linked to content of the course, connections to course, fulfills task expectations)
3. Implications/Future Directions (important, generalizability, options available, research focus)
4. Overall Richness of Ideas (richness of information, elaboration, originality, uniqueness)
5. Overall Coherence (clarity, unity, organization, logical sequence, synthesis, style)
6. Overall Completeness (adequate info presented, fulfills task, no gaps/holes, precise, valid pts)

Option E. Other: Student Determined Equivalent Related to R546 Content (Note: needs approval)

Note: The course Website (i.e., the Bobweb) was created in 1996 by Dr. Jamie Kirkley and later updated by Noriko Hara (now an IU professor). You can improve it or create an interactive online glossary, super summary video, series of podcast shows, or some other useful product. When done, you are to write a 2-3 page single spaced reflection paper on about your project and what you learned from it. Grading criteria will depend on the project selected. I look forward to seeing your creative efforts!

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Instructor: Curt Bonk

Bonk's Best Books: Reading Resources for Creative Thinking, Critical Thinking, and Collaborative Learning

Creative Thinking

- Adams, James L. (1986). *The Care & Feeding of Ideas: A Guide to Encouraging Creativity*. New York: Addison-Wesley.
- Baer, John. (1997). *Creative Teachers, Creative Students*. Boston: Allyn and Bacon.
- Newstrom, John, & Edward Scannel. (). *Still More Games Trainers Play*. City: Publisher.
- Starko, Alane Jordan. (1995). *Creativity in the Classroom: Schools of Curious Delight*. White Plains, NY: Longman.

Creativity Card Games

- Burris, Daniel. (1993). *Techno Trends: 24 Technologies That Will Revolutionize Our Lives*. Stamford, CT: U.S. Games Systems.
- von Oech, Roger. (1988). *Creative Whack Pack*. Stamford, CT: U.S. Games Systems.

Critical Thinking

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<http://www.eric-ied/bibs/crit-sec.html>

Curtis Jay Bonk, Ph.D., CPA
Indiana University, Department of Educational Psychology
Phone: (812) 856-8353; Internet: CJBonk@Indiana.Edu

***Video You Wanted:**

- PBS 800-344-3337, (Learning in America: Schools that Work, (1990). EC2556.
Sponsored by: MacNeil-Lehrer, WETA, Chrysler Corp. and hosted by Roger Mudd)
- Or Call IU-Bloomington to rent for \$18.70 (phone: (812) 855-2103)

Other Video Collections:

- American Express: Geography Competition
- Assoc. for Supervision & Curric. Devel (ASCD): Cooperative Learning; (703) 549-9110
- The Brokaw Report: Schools--Pass or Fail.
- Dr. Leonard Burrello's (IU): Learner-centered schools (2 tapes) (812) 855--5090; 6-8378
(Tape 1: Learner-centered schools; Tape 2: Gathering the Dreamers)
- Allyn & Bacon's: CNN Connections
- Disney: The American Teacher Awards (818) 569-7500; (213) 939-5991
- Indiana University: Making large classes work; (812) 855-2103
- McREL: For Our Students: For Ourselves (303) 337-0990; \$79.00?
(you can also call Dr. Burrello for these)
- PBS: Why do these kids love school?
- Peter Jennings, Common Miracles: The New Revolution in Learning; (800-ABC-7500)
Cost = \$19.98 + Shipping.

**ARE
SMARTER
SCHOOLS
LEARNER
CENTERED???**

Action Plan (Bonk 2002)

Name: _____

1 e-Learning Objectives/Problem Statement: What is the current problem situation or opportunity? What might you do with active learning in your classes or with technology in the near future? What are your objectives? What are the short- and long-term goals?	
2 Budget: What is the range of budget you might have? When will this money be available?	
3. Stakeholders: Who will this project or plan address? Who will need to be involved in this project? Who are the key players?	4 Timeline: What is your timeline for planning, implementing, evaluating, and reporting this project or initiative?
5 Resources & Problems: What are the key resources you need to carry out this project? What key problems might you encounter here?	6 Possible Resolutions and Strategies: How will you obtain these resources and overcome these problems? Do you have any back-up or contingency plans?
7 Technologies: What technologies will help you accomplish your goals? What tools, systems, or hardware need to be acquired? By when?	8 Evaluation and Assessment: How will success of the project be determined? What assessment tools and strategies might help?
9 Implementation: When will this project be implemented? Who will be involved in these implementation efforts? What are the key issues to consider prior to implementation?	

"If one were to chronicle the number of innovations that have come and gone in the history of American education, the list would undoubtedly fill volumes...It is likely that the innovation cycle that has arisen in the American educational system has left the heads of teachers, students, and parents spinning faster than political campaign rhetoric."

From p. 31 of Alexander, P. A., Murphy, P. K., & Woods, B. S. (April, 1996). The Squalls and Fathoms: Navigating the Seas of Educational Innovation. *Educational Researcher*, 25(3), 31-36, & 39.

Secretary's Commission on Achieving Necessary Skills

SCANS COMPETENCIES

Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens, and speaks

- A. Reading - locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
- B. Writing - communicates thoughts, ideas, information, and messages in writing and creates documents such as letters, directions, manuals, reports, graphs, and flow charts
- C. Arithmetic/Mathematics - performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques
- D. Listening - receives, attends to, interprets, and responds to verbal messages and other clues
- E. Speaking - organizes ideas and communicates orally

Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons

- A. Creative Thinking - generates new ideas
- B. Decision Making - specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative
- C. Problem Solving - recognizes problems and devises and implements plan of action.
- D. Seeing Things in the Mind's Eye - organizes and processes symbols, pictures, graphs, objects, and other information.
- E. Knowing How to Learn - uses efficient learning techniques to acquire and apply new knowledge and skills.
- F. Reasoning - discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem

Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.

- A. Responsibility - exerts a high level of effort and perseveres towards goal attainment.
- B. Self-Esteem - believes in own self-worth and maintains a positive view of self
- C. Sociability - demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings
- D. Self-Management - assesses self accurately, sets personal goals, monitors progress, and exhibits self-control
- E. Integrity/Honesty - chooses ethical courses of action.

FIVE COMPETENCIES

Resources: Identifies, organizes, plans, and allocates resources

- A. Time - Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.
- B. Money - Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.
- C. Material and Facilities - Acquires, stores, allocates, and uses materials or space efficiently
- D. Human Resources - Assesses skills and distributes work accordingly, evaluates performance and provides feedback.

Interpersonal: Works with others

- A. Participates as Member of a Team - contributes to group effort.
- B. Teachers Others New Skills
- C. Serves Clients/Customers - works to satisfy customers' expectations
- D. Exercises Leadership - communicates ideas to justify position, persuades and convinces others, responsibly, challenges existing procedures and policies.
- E. Negotiates - works toward agreements involving exchange of resources, resolves divergent interests.
- F. Works with Diversity - works well with men and women from diverse backgrounds

Information: Acquires and uses information

- A. Acquires and Evaluates Information.
- B. Organizes and Maintains Information
- C. Interprets and Communicates Information
- D. Uses Computers to Process Information

Systems: Understands complex interrelationships

- A. Understands Systems - knows how social, organizational, and technological systems work and operates effectively within them.
- B. Monitors and Corrects Performance - distinguishes trends, predicts impacts on system operations, diagnoses systems performance and corrects malfunctions
- C. Improves or Designs Systems - suggest modifications to existing systems and develops new or alternative systems improve performance

Technology: Works with a variety of technologies

- A. Selects Technology - chooses procedures, tools, or equipment including computers and related technologies.
- B. Applies Technology to Task - Understands overall intent and proper procedures for setup and operation of equipment
- C. Maintains and Troubleshoots Equipment - Prevents, identifies, or solves problems with equipment, including computers and other technologies.

Shortfalls of Educational Achievement

I. Fragile Knowledge

Students do not remember, understand, or use actively much of what they have supposedly learned.

- **Missing Knowledge -**

Not knowing information they ought to know

- **Inert Knowledge -**

Inactive Knowledge, present but not always put to use--helps students pass tests.

- **Naive Knowledge -**

Mistaken conceptions or notions about facts and information. Sometimes takes the form of stereotypes.

- **Ritual Knowledge-**

Knowing the "lingo", the "games", but not having a full understanding of the concepts, facts or ideas

II. Poor Thinking

Students do not think very well with what they know

- **Poor Handling of Problems**

- **Poor Inferences**

- **The "Knowledge-Telling " Strategy**

Knowledge not organized into thoughtful arguments- Failure to think critical about information

- **Repetition**

(Perkins, 1992)

3 Characteristics of Smart Schools

● Informed

Administrators, teachers, and students know about human thinking and learning, school structure and collaboration and how they work best.

● Energetic

Measures are taken to cultivate positive energy in the structure of the school, style of administration, and treatment of teachers and students

● Thoughtful

People are sensitive to one another's needs and treat others thoughtfully. The teaching and learning process and the school decision-making process are thinking centered.

Problems with the curricula:

1. Testing only on content taught in the course
2. Reviewing by identifying main categories
3. Presenting test items according to sequence taught
4. Assigning long course papers on a single subject
5. Teaching topic outlining and using note cards
6. Assigning topics that turn students on
7. Use prewriting activities to activate knowledge stores
8. Teaching concepts in hierarchical fashion
9. Giving passing marks to students who actually don't address problems presented, but show that they have learned something.

Enemies of the lecture:

1. preoccupation with previous hour--need focus
2. emotional moods--need productive learning mode
3. sleepy students--need engage students
4. lack of understanding--check for misconceptions
5. isolation and alienation--discuss and elaborate points
6. entertaining to make seem easy--make learning personal

Bonk's Active Learning Principles:

1. knowledge is not possession but access.
2. comfortable with guided learning approach.
3. realize the connectedness of knowledge.
4. construction of knowledge over instruction.
5. pride and ownership of products.
6. knowledge is constructed and organized in various ways.
7. must developmentally grow in awareness of multiple viewpoints.
8. respect, appreciate, and feel responsible for peer learning.
9. prior knowledge important to new knowledge.
10. develop positive self-concept and attitudes toward school.
11. find personal needs met by working on problems with peers.
12. be aware that rdg and wtg skills extend across disciplines.
13. view one's learning capacity/potential positively.

LEARNING METAPHORS

=====

Teacher/Text Centered Learning to

Student/Thinking skill Centered

Student Generated/Problem centered Learning

=====

Knowledge Transmission/Conveyed to

Know Construction/Design/Guided to

Know Transformation/Creation/Discovered

=====

Inert/Passive/Boring/No Pride to

Connected/Active/Responsibility/Ownership to

Interdisciplinary/Love of Lrng/Aesthetic Apprec

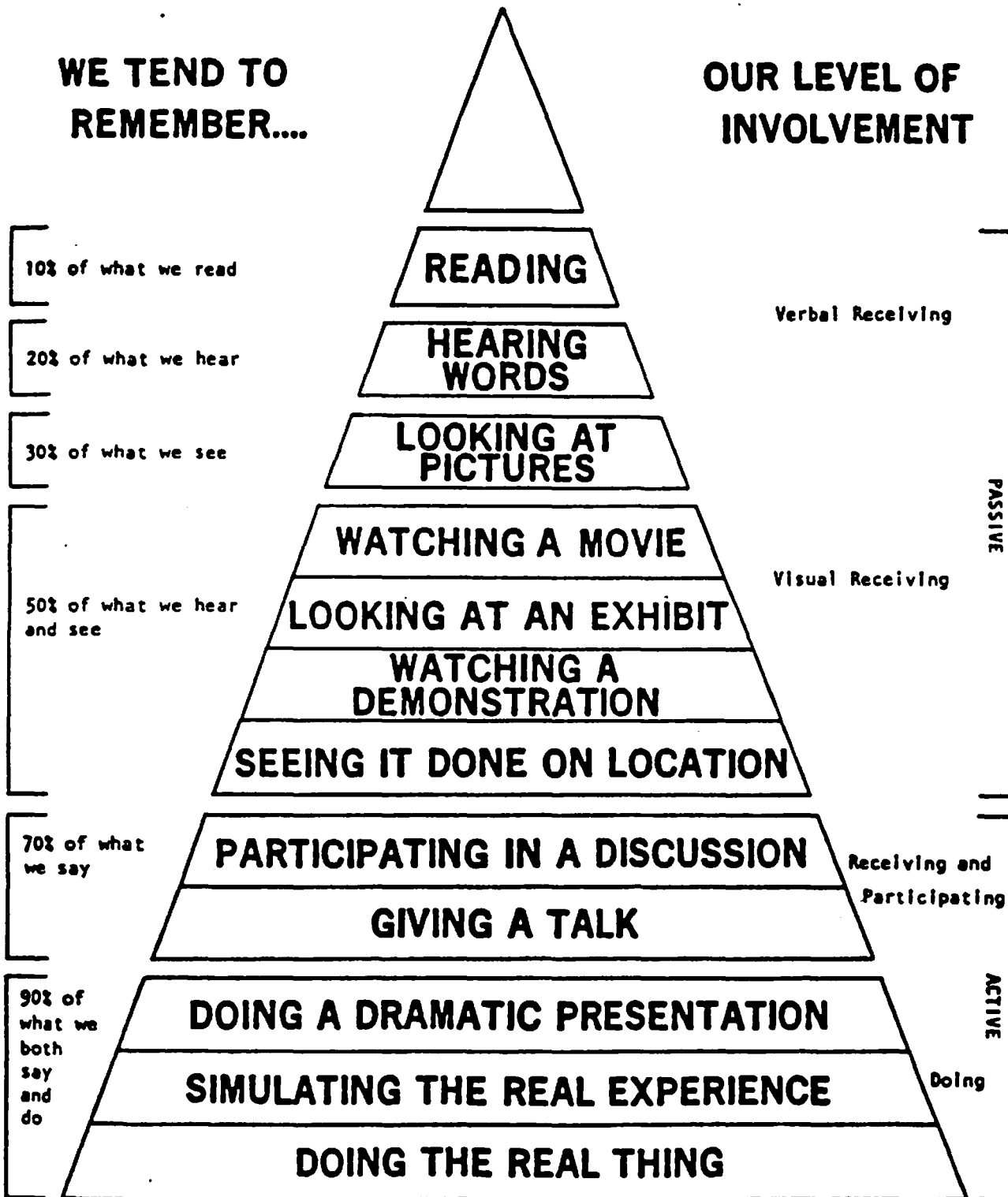
=====

Learner as Sponge (one right answers) to

Learner as Growing Tree (multiple answers) to

Learner as Pilgrim on Journey (don't know answers)

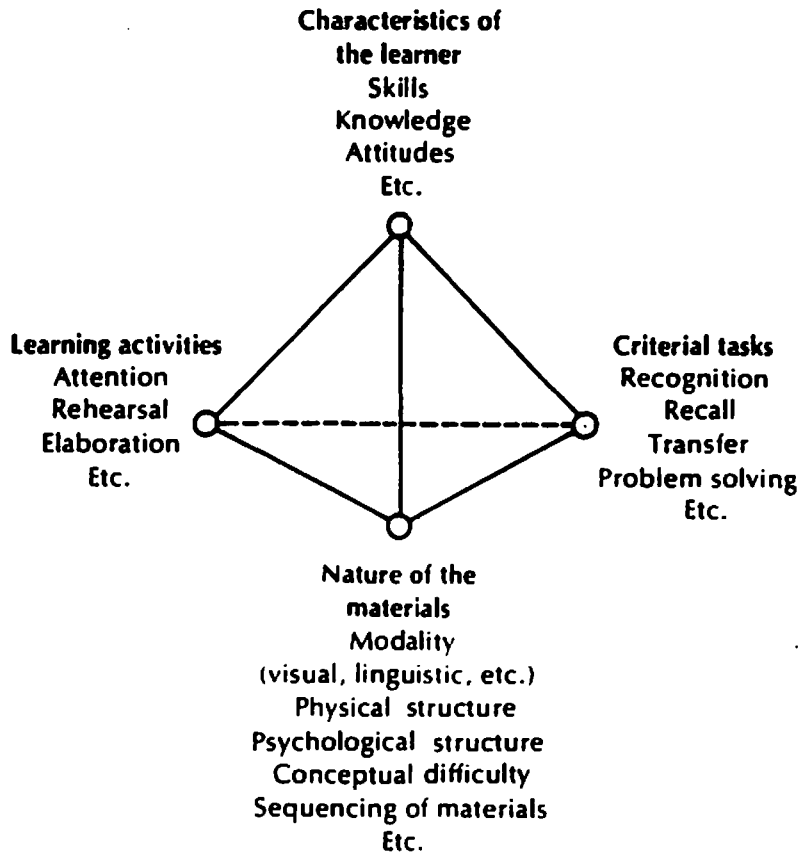
EXPERIENCE AND LEARNING



CONE OF LEARNING

developed and revised by Bruce Hyland
from material by Edgar Dale

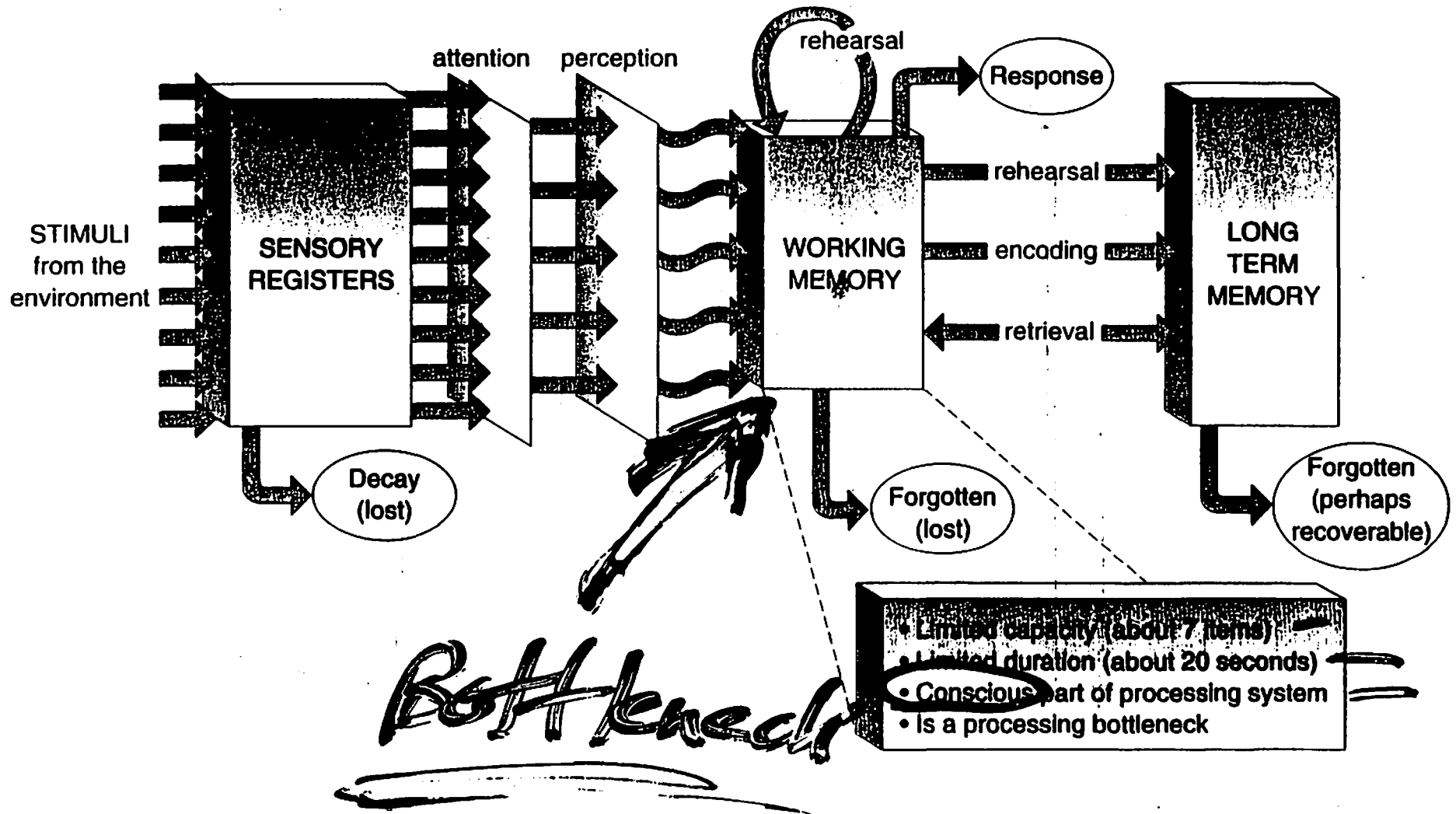
Figure 1.1
An Organizational
Framework for
Exploring Questions
about Learning,
Understanding, and
Remembering.
 (Adapted from
 Jenkins, 1978. Used
 by permission.)



Source : John D. Bransford (1979).
 Human Cognition : Learning, Understanding
 and Remembering. Belmont, CA: Wadsworth

II. Tetrahedron Model of Learning

FIGURE 7.4 Characteristics of working memory



Overall Learning Strategies:

- Focusing Attention
- Rehearsal
- Imagery
- Elaboration and Organization
- Comprehension Monitoring
- Affective Statements
- Reviewing and Summarizing
- Keeping Records & Monitoring Prog
- Goal Set, Plan Ahead, Revise Plans
- Self-Evaluation of Comprehension
- Seeking Information & Assistance
- Environmental Structuring

Individual Tactics:

- Identify Text Importance, Main Ideas
- Use Mnemonics: Pegword, Acronyms
- Drawing Appropriate Inferences
- Generating Self-Questions
- Create Analogies and Metaphors
- Write Notes, Highlight, or Underline
- Read Ch. Summaries, Hdgs, Signals
- Outlines, Grp Material, Concept Maps
- Restate, Look-Back, Repeat, Reread

Jot down one thing you do to elaborate on material you are trying to LEARN (i.e., how you try to connect it, remember it, make it more meaningful, embellish it, etc.):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____

PEOPLE

Undergraduate Overachiever

Aaron Swartz, an 18-year-old computer whiz who in 2000 helped develop the popular Web-content distribution software RSS.

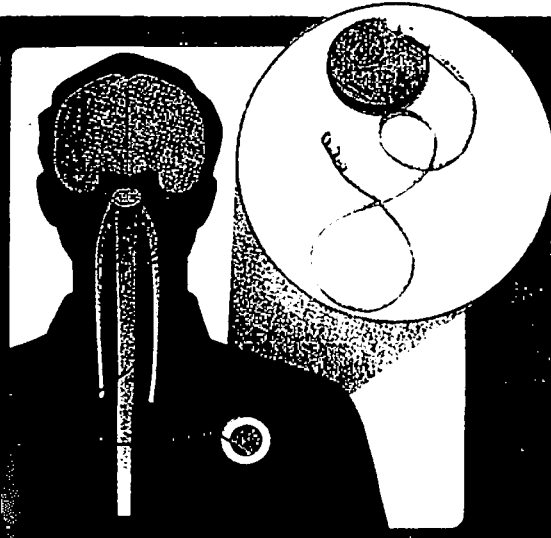
In addition to editing the specs for RSS, Swartz built the Web site for warchalking, the short-lived graffiti approach to locating Wi-Fi hot spots. He's also an adviser on metadata issues for Creative Commons, Stanford law professor (and *Wired* columnist) Lawrence Lessig's copyright think tank.

Now that Swartz has been palling around with Lessig, he's liking law. "Four years ago I probably would have said I'd be some kind of startup guy," says Swartz, now entering his freshman year, "but the law seems really interesting to me. It's a system of rules, like computers are ... and you can hack it by finding the implications of those rules. Go to a judge, show your hack, and the judge has the power to change the world based on your conclusions."

A native of Highland Park, Illinois, Swartz has long had his eye on the San Francisco Bay Area. He applied to only Stanford and UC Berkeley. Cal turned him down. Maybe the recommendation letter from Lessig greased the wheels in Palo Alto. — Cyrus Farivar



Really early adopter: Swartz worked on RSS 1.0 at age 14.



IMPLANTS

The 3.5-Milliamp Joy Buzzer

Antidepressants like Prozac are among the most widely prescribed drugs in the US. But they don't work for everyone. Soon, patients resistant to pills may have a more effective remedy: electricity. An FDA advisory panel has recommended approval of a pacemaker-like device to treat depression.

The stopwatch-sized Vagus Nerve Stimulator delivers regular zaps of between 0.25 and 3.5 milliamps from a pulse generator implanted in the patient's upper chest to the vagus nerve on the left side of his or her neck. Twenty years ago Jake Zabara, a Temple University physiologist, discovered he could quell epileptic seizures in dogs by stimulating the vagus. Since then, almost 30,000 people with epilepsy have gotten the implants. Some reported feeling happier as a side effect; the vagus appears to affect neurotransmitters involved in mood regulation.

At a recent conference, a team of researchers presented data showing that of 180 patients who didn't respond to treatment for chronic depression, half got good results from the device. Still, don't expect to dial up feelings of wistfulness or ambition any time soon — the FDA is interested only in wiping out depression. What a bummer. — Peter Farley

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High School Survey of Student Engagement



Indiana University School of Education
Bloomington

Highlights

Home | Search | Contact Us

- Registration
- About HSSSE
- In the News
- See the Survey
- Survey Cost
- HSSSE Team
- Contact HSSSE
- FAQ

High School Survey of Student Engagement

I wish school could be intellectually challenging as well as academically challenging.

--- HSSSE 2006 student respondent

Thank you for your interest in the High School Survey of Student Engagement!

Click here to download the HSSSE 2006 report, released on February 28, 2007.

The HSSSE 2006 report, *Voices of Students on Engagement*

Click here to read the media release announcing the HSSSE 2006 report:

<http://newsinfo.iu.edu/news/page/normal/4948.html>



The High School Survey of Student Engagement

Invites you to participate in the 2006 survey

Invitation to Participate

NSSE

Read about HSSSE's college counterpart NSSE:

National Survey of Student Engagement

Special Report

ARE HIGH SCHOOL STUDENTS READY FOR COLLEGE?

How engaged in learning are students in your school?

The High School Survey of Student Engagement (HSSSE, pronounced "hessie") can help you find out. HSSSE is a new survey that offers teachers and administrators actionable information on school characteristics that shape the student experience.

HSSSE was completed by nearly 300,000 students from high schools across 29 states in 2004, 2005 and 2006. It's a short, reliable, paper-based survey that is easy for students to complete.

You are invited to peruse the HSSSE website and join the HSSSE team today!

Registration for HSSSE 2007-2008 is now open!

Click here to begin in the registration process.

Do you want information on HSSSE?

Please fill out this interest form if you would like more information about HSSSE 2006-2007! We will get in touch with you, and provide information and updates!

Call or e-mail us!

Do you have questions about HSSSE? Please contact us! You can reach us by phone at 812-856-1429 or by e-mail at hssse@indiana.edu.

Features

- ▶ Register for HSSSE 2007 - 2008
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Searching for signs of engagement

Since 2000, the National Survey of Student Engagement has measured student involvement in key practices associated with learning, persistence and graduation. Each participating school receives scores for first-year students and seniors in five "benchmark" categories. To view the scores of schools that have agreed to share their NSSE data with USA TODAY, click on the map — or search by school name or type — and then click on the name of a school.

Search

Results

BY REGION

Click a school for scores

- Indiana State University (IN)
- Indiana University-Bloomington (IN)
- Indiana University-East (IN)
- Indiana University-Knox (IN)
- Indiana University-Purdue University-Indianapolis (IN)
- Indiana University-South Bend (IN)
- Marion County Community College (IN)
- University of Indianapolis (IN)

BY INSTITUTION TYPE

- Doctorate-Granting Universities**
 - Research Universities (very high research activity)
 - Research Universities (high research activity)
 - Doctoral Research Universities
- Master's Colleges and Universities**
 - Master's Colleges and Universities (larger programs)
 - Master's Colleges and Universities (medium programs)
 - Master's Colleges and Universities (smaller programs)
- Baccalaureate Colleges**
 - Baccalaureate Colleges (Arts & Sciences)
 - Baccalaureate Colleges (Diverse Fields)

Indiana University Bloomington

Bloomington, IN
Survey year: 2007
Institution type: Research Universities (very high research activity)
Public

NSSE BENCHMARKS	First-year students	Seniors
Level of academic challenge Definition: ...	54.0	56.5
Active and collaborative learning Definition: ...	41.8	50.1
Student-faculty interaction Definition: ...	34.5	42.8
Enriching educational experiences Definition: ...	28.5	44.0
Supportive campus environment Definition: ...	59.5	58.9

By Dan Goldstein, Anthony G. Evans and Chad Parker, USA TODAY

How to make NSSE scores work for you

More information from NSSE

How to make NSSE scores work for you

USATODAY.COM | Education | 2 | November 1, 2007

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STUDENT ENGAGEMENT

The database: Open to all colleges and universities that participate in the survey.



Beyond college rankings: NSSE offers a different way to compare schools.



USA TODAY's Mary Beth Marklein: She shares her perspective on the survey.



Need expert advice?: Ask the experts at the National Association of Colleges and Business Administrators (NACAC).



Student engagement: A key to success in college.

On the web: Find more information.

By Mary Beth Marklein, USA TODAY

Colleges and universities use the National Survey of Student Engagement to figure out how and where they can improve the undergraduate experience on their campuses.

But college-bound students can also learn from NSSE. It can help them evaluate whether a particular campus offers the kinds of experiences and opportunities that are known to benefit students.

NSSE works like this: The survey is sent to randomly selected first-year and senior students at participating colleges. The questions are related to desired outcomes of college and address five types of experiences, having to do with areas such as academic challenge or exposure to cultural activities, that research suggests any college-bound student ought to be looking for.

The 5 "benchmark" categories

The responses translate into five "benchmarks," which schools can compare against national averages for institutions of their type.

FIND MORE STORIES IN: [Colleges](#) | [Student](#) | [NSSE](#)

Level of academic challenge:

Challenging intellectual and creative work is central to student learning. Students are asked, for example, how much time they spent preparing for class, number of written papers or reports they write, and whether the coursework emphasizes things like synthesizing ideas or applying theories to practical problems.

Active and collaborative learning:

page 31

Students learn more when they are intensely involved in their education. Students are asked, for example, how often they participated in class discussions, made a class presentation, worked with classmates outside of class to prepare assignments, or discussed ideas from readings outside of class.

Student-faculty interaction:

Contact with professors offers students an opportunity to see how experts think about and solve practical problems. Students are asked, for example, whether they have worked with faculty members on activities outside of coursework, received prompt written and oral feedback, or worked with a faculty member on a research project.

Enriching educational experiences:

Activities that complement the classroom experience can make learning more meaningful. Students are asked, for example, whether they have had serious conversations with students who have different beliefs or values, or with students of a different race/ethnicity. They're also asked whether they have studied abroad and participated in student clubs, learning communities, internships and culminating senior experiences.

Supportive campus environment:

Students perform better when their college is committed to their success and cultivates positive social relationships among different groups of people. Students are asked, for example, whether the campus provides "the support you need" to succeed academically and thrive socially and to assess, for example, the quality of their relationships with other students, faculty and the administration.

Making sense of the numbers

Director George Kuh says one of the most important messages NSSE has to offer is that students can typically find opportunities for engaged learning at nearly any school. They just have to know what they should look for. Here, he and his colleagues offer guidelines on how to make the benchmark scores work for you.

Play to your interests:

Consider which categories of engagement and which institutions interest you most. Suppose you are interested in fairly large research institutions and want to know whether students, particularly new students, interact with faculty. You could look at the student-faculty interaction scores for freshmen at schools of that type. From this, you could find those institutions where freshmen are interacting with faculty to a greater extent.

Think about your strengths and weaknesses:

Self-directed learners, for example, may want to investigate opportunities for working on research with a faculty or staff member. Other students may value and benefit more from environments that emphasize group work and collaborative learning.

Don't think of scores as grades or percentages:

Although they are presented on a 0-100-point scale, most schools' scores are in the middle of that range. You won't find perfect scores of 100, or even above 80. And ranges vary by benchmark and by class. Scores range roughly between 30 and 60 for first-year students and between 35 and 65 for seniors. If a score is more than 5 points higher than the national average for a school's institutional type, the difference is likely to be meaningful. But differences of, say, 1 or 2 points are not.

Note average scores for institutional types:

Different types of institutions have different missions and educational programs, so comparisons across institutional types are not always meaningful. Schools that enroll large numbers of adults or commuter students, for example, are likely to have lower scores because such students have less time to spend on campus and, therefore, tend to be less engaged than traditional undergrads who live on campus. But the school's more traditional undergraduate population may be just as engaged as traditional undergraduates at other campuses.

Focus on the big picture:

No matter how low or high the school's benchmark score, there are likely to be many students who are far more engaged than the benchmarks suggest and many who are far less so. "What you really want to know," Kuh says, "is who are the people who are engaged at high levels and what opportunities are they taking advantage of?" Clues from NSSE can help motivated students to look for the same kinds of opportunities at any college.

Don't stop at the NSSE scores:

No matter what colleges you're interested in, at least visit the schools' websites to get additional context about the undergraduate experience there. Follow up with an extensive campus visit at institutions that look promising.

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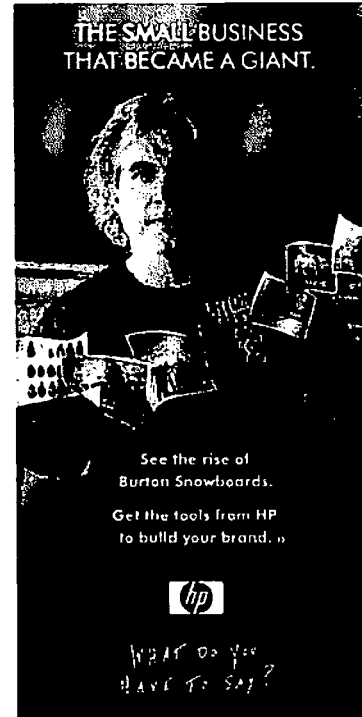
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Beyond rankings: A new way to look for a college

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Enlarge By Sarah Lyall for USA Today

University of Michigan's Marklein, center, background left, and David B. Page, left, Michigan State University's Marklein, center, and David B. Page, right, Michigan State University's Marklein, center, and David B. Page, right.

By Mary Beth Marklein, USA TODAY

When Michael Turchy sought a job with the state of North Carolina straight out of college in 2001, his interviewer seemed surprised that he had already published research on wetlands.

"I had direct experience others didn't have," says Turchy, environmental supervisor for the transportation department and a graduate of Western Carolina University in Cullowhee, N.C. "I could tell he was a little impressed."

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A leg up in the job market is just one way students can benefit when they work closely with faculty, sometimes side-by-side in research. And the degree to which faculty work with students is the kind of thing prospective students might want to look for when they consider where to apply for college.

Problem is, that kind of information hasn't typically been available to the public in a meaningful way.

The National Survey of Student Engagement wants to change that. While many popular college guides focus on things like SAT scores of incoming freshmen, or a college's party-school reputation, NSSE (pronounced "nessie") seeks to gauge the quality of an undergraduate education by looking at how actively involved students are with their studies, professors and the campus community. Decades of research shows that the more engaged students are, the more likely they are to learn.

FIND MORE STORIES IN: Universities | Learning | US News | NSSE | George Kuh

Colleges appear to welcome such information. Since its 2000 debut, NSSE has surveyed nearly 1,200 schools at least once, and it has spawned similar surveys for law schools, community colleges and other populations.

Most colleges keep results confidential, using their data as an internal assessment tool. But this year, for the first time, NSSE is encouraging participating schools to make their scores publicly available.

USA TODAY, in partnership with NSSE, is publishing this guide in print and online to show how NSSE can enhance the college search. More than 250 schools have agreed to disclose their scores.

Pressure from Congress is one reason colleges are moving toward greater transparency, another is growing discontent with rankings like those compiled by *U.S. News & World Report*.

Accrediting agencies, which provide a third-party stamp of approval to colleges, have been asking since the 1990s for evidence that students are benefiting from their education. Congress has for years denied the absence of useful information available to students and parents. And a national commission appointed by Education Secretary

Student engagement: What schools are doing

How do we parents talk about the A?

On the web: College search resources



Enlarge Western Carolina

David B. Page, left, director of Western Carolina's Program for the Study of Government, and Sarah Lyall, left, Michigan State University's Marklein, center, and David B. Page, right.

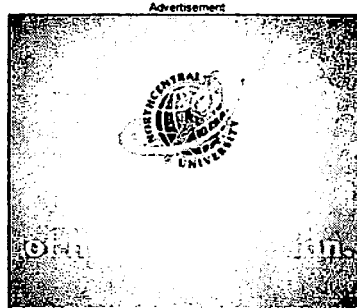
Margaret Spellings last year urged colleges to consider publishing results from NSSE and other assessment tools as a way to help families see what they're getting for their tuition dollars.

In a bid to circumvent federal oversight, a number of non-profit higher education groups have developed or are developing websites through which consumers can get information, including NSSE scores in some cases, in easy-to-compare formats. More than 600 private institutions have signed up to participate in a website launched in September by the National Association of Independent Colleges and Universities. A similar initiative by the National Association of State and University Land Grant Colleges is expected to debut in January, it was developed with the American Association of State Colleges and Universities. Other projects are in the works for research universities and online education.

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English professor Julia Williams, who heads the institutional research office of Rose-Hulman Institute of Technology in Terre Haute, Ind., says her school is making its NSSE scores available to families for the first time today because transparency is "the right thing to do."

Choosing a college "is a major life decision, and (families) want to feel confident that they have made the right one," she says.

Rankings still rankle

Admissions officials have long grumbled about rankings. But this year the rancor has developed into something resembling rebellion. Dozens of college presidents have vowed to not participate in U.S. News surveys and to not promote their status in the rankings.

They have lots of complaints, but mostly, the argument is that U.S. News rankings focus on the wrong things — wealth, prestige and exclusivity — and mask the characteristics that make each institution distinctive, such as its mission, the types of students it attracts and the resources it has available.

NSSE, in contrast, is "about trying to get people to talk about things that matter," says NSSE director George Kuh, an Indiana University education professor.

Perhaps even more, he suggests, NSSE challenges the rankings-driven notion that only a sliver of colleges are worthy of consideration. "There are many innovative programs being offered today, often at a college or university right around the corner," he says.

Housed in a cinder-block student dorm that has been converted into office space for Indiana University's Center for Postsecondary Research, NSSE is not the only answer to the growing demand for better information. Many schools use more than one assessment, including homegrown studies. More than 330 schools have used the Collegiate Learning Assessment, which assesses critical-thinking skills, since it was piloted in 2002-2003 by the New York-based Council for Aid to Education. About 130 schools use the Collegiate Senior Survey, which is conducted by UCLA's Higher Education Research Institute and is similar to NSSE. A consortium of 31 highly selective private colleges and universities survey students and share data.

But the still-growing NSSE remains among the most widely used and, arguably, the most visible. Initially supported with a \$3.7 million grant from the Pew Charitable Trusts, NSSE has supported itself since 2003. Colleges pay \$1,800 to \$7,800, with price based on enrollment and other factors.

NSSE is made up of 85 questions, 42 of which contribute to five categories, or "benchmarks." Research shows that these activities, while not direct measures of learning, are associated with student success. Questions seek to elicit information about the level of academic challenge, student-faculty interaction, the extent to which a college offers an active and collaborative learning environment, opportunities to take advantage of cultural or extracurricular experiences, and whether the school creates a supportive environment for different groups on campus.

To see whether students are challenged academically, for example, they are asked how many books they were assigned to read, how many papers they write and how much time they spend preparing for classes.

NSSE then tabulates results for each school and provides five benchmark scores showing how it stacks up compared with the national average for similar types of institutions.

After poring over its NSSE findings, Baltimore's College of Notre Dame of Maryland, where two-thirds of the undergraduates attend part time, redesigned its advising, among other things, with an emphasis on better accommodating part-time students.

At Auburn University, a public university in Alabama, the board of trustees this year approved a writing initiative aimed at increasing the quantity and quality of writing done by its undergraduates. The trustees have set a goal for Auburn's scores on certain writing-related NSSE items to surpass the average score for its peer group.

And after NSSE results at Saint Michael's College in Colchester, Vt., demonstrated that first-year students benefit from regular interaction with professors, the school set a goal to increase the percentage of full-time faculty who teach first-year seminars.

"Very often the data confirm something we already know but perhaps lacked empirical confirmation," says John Kuchowick, director of institutional research and communication at Saint Michael's. "The case was easier to make with this data in hand."

Most colleges declined

It's one thing to use the data to quietly improve, another to go public. Most of the schools that were approached about being included in USA TODAY's website either declined or did not respond to multiple requests. And many of those that agreed to publish their results say they worry that the data could be misused.

NSSE strongly discourages the use of NSSE data in any type of ranking, for example, arguing that rankings "are inherently flawed as a tool for accountability and improvement."

Yet just weeks ago, publicly available student engagement data for community colleges were used to come up with rankings. The list, produced by a policy analyst with an education think tank and published in September's *Washington Monthly*, drew a swift rebuke from administrators of that engagement survey.

Another worry is that NSSE could be used to somehow penalize schools with scores that are less than flattering to the naked eye. This year, for example, federal officials proposed that colleges be required to report to the Education Department, as a condition of receiving federal aid, whether their institutions use NSSE or other assessment tools, whether results are available online, and what the Web address is. The request was later withdrawn. But to many higher education groups, that veered dangerously close to federal regulation.

Underlying those concerns is the sense that NSSE's data are simply too complicated for the average consumer or policymaker to grasp. Consider, for example, that when NSSE scores are provided to colleges, they come with a three-ring binder filled with instructions.

"Most people ... do not necessarily have the time to become experts on what it all means" says John Novak, director of institutional research at Indiana University South Bend.

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Ivys haven't used NSSE

Notably absent from NSSE's participation list are many of the schools that fare well in U.S. News rankings. None of the Ivys, for instance, have participated, though the number of top-ranked liberal arts colleges is climbing.

The low participation rate doesn't surprise Peter Ewell, vice president of a non-profit higher education consulting group in Boulder, Colo., and chair of the committee of higher education researchers that developed the framework for what eventually became NSSE.

Top-ranked schools are benefiting from U.S. News rankings, he says. "Why throw the dice when you're on top?"

For its part, U.S. News in recent years has published answers to selected NSSE questions volunteered by schools. 176 recently provided results from the 2006 NSSE survey.

Editor Brian Kelly says rankings and NSSE both provide useful information. But with so few schools disclosing NSSE scores, he says he doesn't worry about NSSE replacing rankings as a consumer service.

"The issue is comparability," he says. The discussion keeps coming back to this notion of why the rankings are valuable. We've been able to come up with comparable data across a wide number of schools."

Former Harvard president and early NSSE supporter Derek Bok, in his 2006 book, *Our Underachieving Colleges*, suggests that NSSE's low participation rates help "confirm the impression that institutions at the top of the U.S. News rankings are rarely leaders in seeking innovative efforts to improve student learning on their campuses."

But David Jameson-Drake, director of institutional research at Duke University, which ranked eighth this year among U.S. News' national universities, says that assumption misses the mark.

He says he has no major problem with NSSE as an assessment tool, he simply believes other measures are more appropriate for his school. And, he says, he sees no benefit to publishing NSSE scores for comparative purposes. "There is a bit of an attitude of 'Gosh, if you're not doing NSSE, then you're hiding something,'" he says. "I'm frankly somewhat mystified why people are so enthused" about NSSE.

Kuh, for his part, acknowledges that NSSE has its limits. That's one reason he recommends that schools use NSSE in rotation with other assessment tools.

"No single assessment tool can tell an institution everything it needs to know," he says, "but almost everyone agrees that (NSSE) focuses on activities that help students develop the habits of the mind that they need to survive and thrive during and after college."

And now, more than ever before, some college officials acknowledge, colleges should be willing to open themselves up to public scrutiny.

"I have colleagues (who have) for years said, 'What we do is self-evident and trust us,'" says Paul Koch, associate vice president for assessment and institutional research at St. Ambrose University in Davenport, Iowa.

"The reality is that what we do is not self-evident. ... It is also clear that our constituencies no longer trust us to the degree that they used to, and that is unfortunate."

Contributing G Jeffrey MacDonald

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1096247 wrote: 6/23/07 ladiesman

I didnt try to copy, thats just my completely opinion about my experience in college. lol I think I did a great thing by going to a technical college instead of a university for vanous different

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National Survey of Student Engagement

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Project: National Survey of Student Engagement (NSSE)

Project Support: The NSSE was launched with support from [The Pew Charitable Trusts](#) and is currently self-supported through institutional participation fees. Project research is also supported by grants from [Lumina Foundation for Education](#) and the Center for Inquiry in the Liberal Arts at Wabash College.

Survey Name: The National Survey of Student Engagement

NSSE Director: George Kuh

Survey Design: National design team chaired by Peter Ewell, National Center for Higher Education Management Systems

Administration: Indiana University Center for Postsecondary Research in cooperation with the Indiana University Center for Survey Research

Objectives: The National Survey of Student Engagement (NSSE) obtains, on an annual basis, information from hundreds of four-year colleges and universities nationwide about student participation in programs and activities that institutions provide for their learning and personal development. The results provide an estimate of how undergraduates spend their time and what they gain from attending college. Survey items on The National Survey of Student Engagement represent empirically confirmed "good practices" in undergraduate education. That is, they reflect behaviors by students and institutions that are associated with desired outcomes of college.



Faculty discussions spark some rigorous debates about the validity and reliability of the NSSE... But in the main, we value the information, attend to it, and move to create ways to shore up the soft areas exposed by the reports

Daryl H. Stevenson, Dean of Academic Administration, Houghton College

Institutions use their data to identify aspects of the undergraduate experience inside and outside the classroom that can be improved through changes in policies and practices more consistent with good practices in undergraduate education. This information is also used by prospective college students, their parents, college counselors, academic advisers, institutional research officers, and researchers in learning more about how students spend their time at different colleges and universities and what they gain from their experiences.

More than 1200 different colleges and universities in the U.S. and Canada have participated in NSSE since it was first administered in 2000. NSSE's widespread use has spawned several other national used instruments including the Beginning College Survey of Student Engagement, the Community College Survey of Student Engagement, the Faculty Survey of Student Engagement, and the Law School Survey of Student Engagement, all of which are supported through institutional participation fees.

NSSE Colleges and Universities:

About 1200 different colleges and universities have participated in NSSE.

NSSE 2008: 769 colleges and universities are participating in the spring 2008 administration.

NSSE 2007: 610 colleges and universities participated in the spring 2007 administration.

NSSE 2006: 557 colleges and universities participated in the spring 2006 administration.

NSSE 2005: 529 colleges and universities participated in the spring 2005 administration.

NSSE 2004: 473 colleges and universities participated in the spring 2004 administration.

NSSE 2003: 437 colleges and universities participated in the spring 2003 administration.

NSSE 2002: 367 colleges and universities participated in the spring 2002 administration.

NSSE 2001: 321 colleges and universities participated in the spring 2001 administration.

NSSE 2000: 276 colleges and universities participated in the spring 2000 administration.

1999 Pilots: Approximately 70 colleges and universities participated in the spring and fall.

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Figure 1

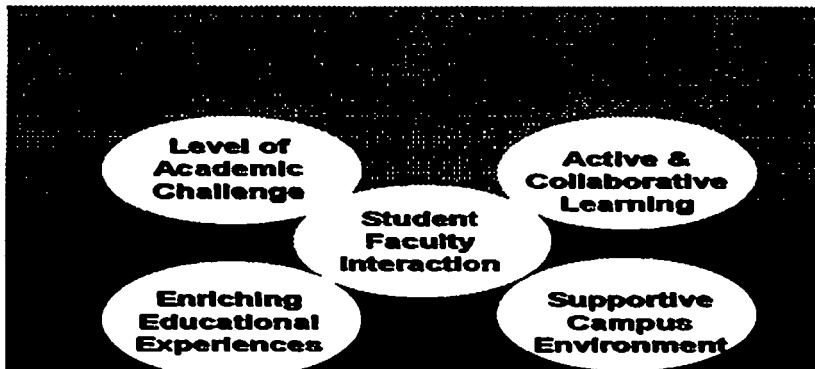


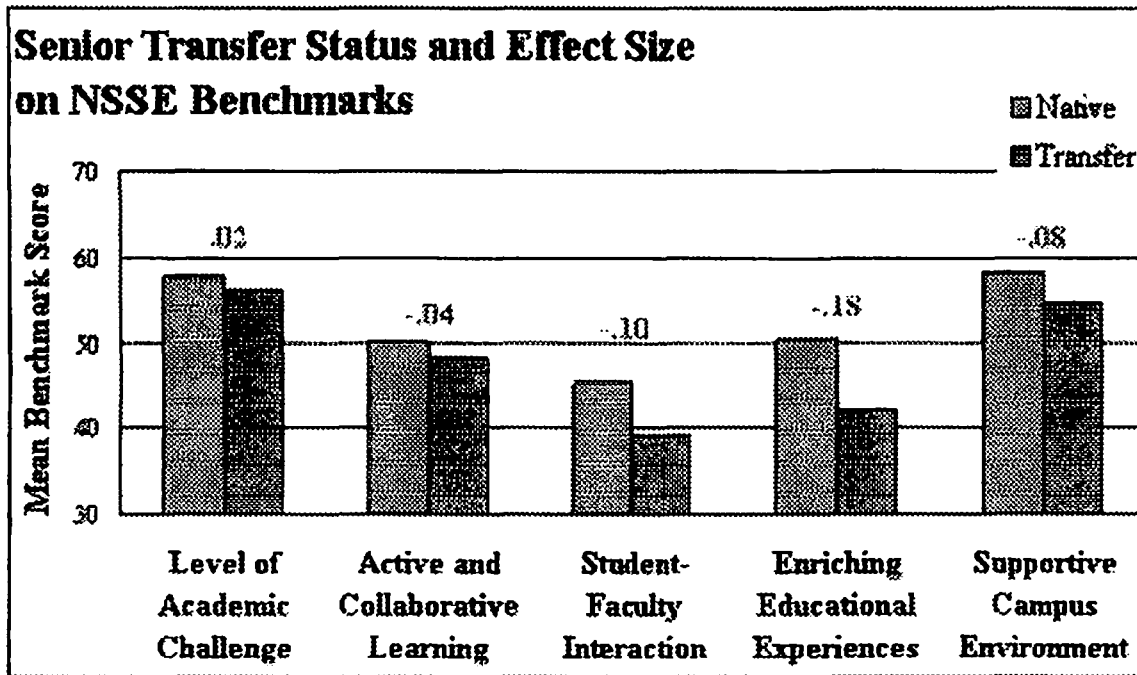
Figure 4

-
- Women
 - Full-time students
 - Students living on campus
 - Native students (those who start at and graduate from the same school)
 - Learning community students
 - International students
 - Students with diversity experiences

What We're Learning About Student Engagement From NSSE

George Kuh
Indiana University Bloomington
In press, March/April, 2003, *Change*

Figure 5



What We're Learning About Student Engagement From NSSE

George Kuh
Indiana University Bloomington
In press, March/April, 2003, *Change*

Figure 1

Benchmarks of Effective Educational Practice

Level of Academic Challenge

Challenging intellectual and creative work is central to student learning and collegiate quality. Colleges and universities promote high levels of student achievement by emphasizing the importance of academic effort and setting high expectations for student performance. 10 questions:

- Preparing for class (studying, reading, writing, rehearsing, and other activities related to your academic program)
- Number of assigned textbooks, books, or book-length packs of course readings
- Number of written papers or reports of 20 pages or more
- Number of written papers or reports between 5 and 19 pages
- Number of written papers or reports fewer than 5 pages
- Coursework emphasizes: Analyzing the basic elements of an idea, experience or theory
- Coursework emphasizes: Synthesizing and organizing ideas, information, or experiences
- Coursework emphasizes: Making judgments about the value of information, arguments, or methods
- Coursework emphasizes: Applying theories or concepts to practical problems or in new situations
- Worked harder than you thought you could to meet an instructor's standards or expectations

Student Interactions with Faculty Members

Through interacting with faculty members inside and outside the classroom students see first-hand how experts think about and solve practical problems. As a result their teachers become role models, mentors, and guides for continuous, life-long learning. 6 questions:

- Discussed grades or assignments with an instructor
- Talked about career plans with a faculty member or advisor
- Discussed ideas from your reading or classes with faculty members outside of class
- Worked with faculty members on activities other than coursework (committees, orientation, student-life activities, etc.)
- Received prompt feedback from faculty on your academic performance
- Worked with a faculty member on a research project

Active and Collaborative Learning

Students learn more when they are intensely involved in their education and are asked to think about and apply what they are learning in different settings. Collaborating with others in solving problems or mastering difficult material prepares students to deal with the messy, unscripted problems they will encounter daily during and after college. 7 questions:

- Asked questions in class or contributed to class discussions
- Made a class presentation
- Worked with other students on projects during class
- Worked with classmates outside of class to prepare class assignments
- Tutored or taught other students
- Participated in a community-based project as part of a regular course

Enriching Educational Experiences

Complementary learning opportunities inside and outside the classroom augment the academic program. Experiencing diversity teaches students valuable things about themselves and other cultures. Used appropriately, technology facilitates learning and promotes collaboration between peers and instructors. Internships, community service, and senior capstone courses provide students with opportunities to synthesize, integrate, and apply their knowledge. Such experiences make learning more meaningful and, ultimately, more useful because what students know becomes a part of who they are. 11 questions:

- Talking with students with different religious beliefs, political opinions, or values
- Talking with students of a different race or ethnicity
- An institutional climate that encourages contact among students from different economic, social, and racial or ethnic backgrounds
- Using electronic technology to discuss or complete assignments
- Participating in:
 - internships or field experiences
 - community service or volunteer work
 - foreign language coursework
 - study abroad
 - independent study or self-designed major
 - culminating senior experience

Supportive Campus Environment

Students perform better and are more satisfied at colleges that are committed to their success and cultivate positive working and social relations among different groups on campus. 6 questions:

- Campus environment provides support you need to help you succeed academically
- Campus environment helps you cop with your non-academic responsibilities (work, family, etc.)
- Campus environment provides the support you need to thrive socially
- Quality of relationships with other students
- Quality of relationships with faculty members
- Quality of relationships with administrative personnel and offices

NSSE-related Publications

(As of January 2003)

Kuh, G.D. (in press). What we're learning about student engagement from NSSE. Change, 35(2).

Kuh, G.D. (in press). The contributions of the research university to assessment and innovation in undergraduate education. In W.E. Becker and M. Andrews (Eds.), The scholarship of teaching and learning in higher education: The contribution of research universities. Bloomington, IN: Indiana University Press.

The NSSE 2000 Report: National benchmarks of effective educational practice (2000). Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.

Improving the college experience: National benchmarks for effective educational practice (2001). Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.

From promise to progress: How colleges and universities are using student engagement results to improve collegiate quality. (2002). Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.

Kuh, G.D., Hayek, J.C., Carini, R.M., Ouimet, J.A., Gonyea, R.M., & Kennedy, J. (2001). NSSE technical and norms report. Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.

Kuh, G.D. (2001). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. Change, 33(3), 10-17, 66.

Kuh, G.D., Gonyea, R.M., & Palmer, M. (2001). The disengaged commuter student: Fact or fiction? Commuter Perspectives, 27(1), 2-5.

Carini, R.M., & Kuh, G.D. (2003). Tomorrow's teachers: Do they engage in the "right things" during college? Phi Delta Kappan, 84(5), 391-398.

Carini, R.M., Hayek, J.H., Kuh, G.D., Kennedy, J.M., & Ouimet, J.A. (in press). College student responses to web and paper surveys: Does mode matter? Research in Higher Education.

Quimet, J.A., Bunnage, J.C., Carini, R. M., Kuh, G.D., & Kennedy, J. (in press). Using focus groups, expert advice, and cognitive interviews to establish the validity of a college student survey. Research in Higher Education.

Field testing a faculty version of the NSSE: (<http://www.collegereport.org/faculty/>) along with a version for law schools (<http://www.iub.edu/nsse/html/law-school.shtml>) and high schools (http://www.iub.edu/~nsse/html/hssse_invitation.htm).

National Survey of Student Engagement 2005

The College Student Report

1 In your experience at your institution during the current school year, about how often have you done each of the following? Mark your answers in the boxes. Examples: or

	Very often ▼	Often ▼	Some- times ▼	Never ▼
a. Asked questions in class or contributed to class discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Made a class presentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Prepared two or more drafts of a paper or assignment before turning it in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Worked on a paper or project that required integrating ideas or information from various sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or writing assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Come to class without completing readings or assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Worked with other students on projects during class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Worked with classmates outside of class to prepare class assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Put together ideas or concepts from different courses when completing assignments or during class discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Tutored or taught other students (paid or voluntary)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Participated in a community-based project (e.g., service learning) as part of a regular course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Used an electronic medium (listserv, chat group, Internet, instant messaging, etc.) to discuss or complete an assignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Used e-mail to communicate with an instructor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Discussed grades or assignments with an instructor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Talked about career plans with a faculty member or advisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Discussed ideas from your readings or classes with faculty members outside of class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. Received prompt feedback from faculty on your academic performance (written or oral)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very often ▼	Often ▼	Some- times ▼	Never ▼
r. Worked harder than you thought you could to meet an instructor's standards or expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
u. Had serious conversations with students of a different race or ethnicity than your own	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2 During the current school year, how much has your coursework emphasized the following mental activities?

	Very much ▼	Quite a bit ▼	Some ▼	Very little ▼
a. Memorizing facts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Analyzing the basic elements of an idea, experience, or theory, such as examining a particular case or situation in depth and considering its components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Synthesizing and organizing ideas, information, or experiences into new, more complex interpretations and relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Making judgments about the value of information, arguments, or methods, such as examining how others gathered and interpreted data and assessing the soundness of their conclusions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Applying theories or concepts to practical problems or in new situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E During the current school year, about how much reading and writing have you done?

	None	Between 1 and 4	Between 5 and 10	Between 11 and 20	More than 20
a. Number of assigned textbooks, books, or book-length packs of course readings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Number of books read on your own (not assigned) for personal enjoyment or academic enrichment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Number of written papers or reports of 20 pages or more	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Number of written papers or reports between 5 and 19 pages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Number of written papers or reports of fewer than 5 pages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F In a typical week, how many homework problem sets do you complete?

	None	1-2	3-4	5-6	More than 6
a. Number of problem sets that take you more than an hour to complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Number of problem sets that take you less than an hour to complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

G Mark the box that best represents the extent to which your examinations during the current school year have challenged you to do your best work.

Very little Very much

1 2 3 4 5 6 7

H During the current school year, about how often have you done each of the following?

	Very often	Often	Some-times	Never
a. Attended an art exhibit, gallery, play, dance, or other theater performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Exercised or participated in physical fitness activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Participated in activities to enhance your spirituality (worship, meditation, prayer, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Examined the strengths and weaknesses of your own views on a topic or issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Tried to better understand someone else's views by imagining how an issue looks from his or her perspective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Learned something that changed the way you understand an issue or concept	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I Which of the following have you done or do you plan to do before you graduate from your institution?

	Done	Plan to do	Do not plan to do	Have not decided
a. Practicum, internship, field experience, co-op experience, or clinical assignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Community service or volunteer work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Participate in a learning community or some other formal program where groups of students take two or more classes together	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Work on a research project with a faculty member outside of course or program requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Foreign language coursework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Study abroad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Independent study or self-designed major	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Culminating senior experience (capstone course, thesis, project, comprehensive exam, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

J Mark the box that best represents the quality of your relationships with people at your institution.

Relationships with:

a. Other Students	b. Faculty Members	c. Administrative Personnel and Offices
Friendly, Supportive, Sense of Belonging	Available, Helpful, Sympathetic	Helpful, Considerate, Flexible
7 <input type="checkbox"/>	7 <input type="checkbox"/>	7 <input type="checkbox"/>
6 <input type="checkbox"/>	6 <input type="checkbox"/>	6 <input type="checkbox"/>
5 <input type="checkbox"/>	5 <input type="checkbox"/>	5 <input type="checkbox"/>
4 <input type="checkbox"/>	4 <input type="checkbox"/>	4 <input type="checkbox"/>
3 <input type="checkbox"/>	3 <input type="checkbox"/>	3 <input type="checkbox"/>
2 <input type="checkbox"/>	2 <input type="checkbox"/>	2 <input type="checkbox"/>
1 <input type="checkbox"/>	1 <input type="checkbox"/>	1 <input type="checkbox"/>
Unfriendly, Unsupportive, Sense of Alienation	Unavailable, Unhelpful, Unsympathetic	Unhelpful, Inconsiderate, Rigid

9 About how many hours do you spend in a typical 7-day week doing each of the following?

# of hours per week	0	1-5	6-10	11-15	16-20	21-25	26-30	More than 30
a. Preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Working for pay on campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Working for pay off campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Participating in co-curricular activities (organizations, campus publications, student government, social fraternity or sorority, intercollegiate or intramural sports, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Relaxing and socializing (watching TV, partying, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Providing care for dependents living with you (parents, children, spouse, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Commuting to class (driving, walking, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10 To what extent does your institution emphasize each of the following?

	Very much	Quite a bit	Some	Very little
a. Spending significant amounts of time studying and on academic work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Providing the support you need to help you succeed academically	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Encouraging contact among students from different economic, social, and racial or ethnic backgrounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Helping you cope with your non-academic responsibilities (work, family, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Providing the support you need to thrive socially	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Attending campus events and activities (special speakers, cultural performances, athletic events, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Using computers in academic work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11 To what extent has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas?

	Very much	Quite a bit	Some	Very little
a. Acquiring a broad general education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Acquiring job or work-related knowledge and skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Writing clearly and effectively	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Speaking clearly and effectively	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Thinking critically and analytically	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Analyzing quantitative problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Using computing and information technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Working effectively with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Voting in local, state, or national elections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Learning effectively on your own	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Understanding yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Understanding people of other racial and ethnic backgrounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Solving complex real-world problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Developing a personal code of values and ethics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Contributing to the welfare of your community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Developing a deepened sense of spirituality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12 Overall, how would you evaluate the quality of academic advising you have received at your institution?

- Excellent
- Good
- Fair
- Poor

13 How would you evaluate your entire educational experience at this institution?

- Excellent
- Good
- Fair
- Poor

14 If you could start over again, would you go to the same institution you are now attending?

- Definitely yes
- Probably yes
- Probably no
- Definitely no

15 Write in your year of birth:

16 Your sex
 Male Female

17 Are you an international student or foreign national?
 Yes No

18 What is your racial or ethnic identification? (Mark only one.)

- American Indian or other Native American
- Asian American or Pacific Islander
- Black or African American
- White (non-Hispanic)
- Mexican or Mexican American
- Puerto Rican
- Other Hispanic or Latino
- Multiracial
- Other
- I prefer not to respond

19 What is your current classification in college?

- Freshman/first-year Senior
- Sophomore Unclassified
- Junior

20 Did you begin college at your current institution or elsewhere?

- Started here Started elsewhere

21 Since graduating from high school, which of the following types of schools have you attended other than the one you are attending now? (Mark all that apply.)

- Vocational or technical school
- Community or junior college
- 4-year college other than this one
- None
- Other, specify:

22 Thinking about this current academic term, how would you characterize your enrollment?

- Full-time Less than full-time

23 Are you a member of a social fraternity or sorority?

- Yes No

24 Are you a student-athlete on a team sponsored by your institution's athletics department?

- Yes No (go to question 25)

↓
On what team(s) are you an athlete (e.g., football, swimming)? Please answer below:

25 What have most of your grades been up to now at this institution?

- A B+ C+
- A- B C
- B- C- or lower

26 Which of the following best describes where you are living now while attending college?

- Dormitory or other campus housing (not fraternity/sorority house)
- Residence (house, apartment, etc.) within walking distance of the institution
- Residence (house, apartment, etc.) within driving distance
- Fraternity or sorority house

27 What is the highest level of education that your parent(s) completed? (Mark one box per column.)

Father Mother

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Did not finish high school |
| <input type="checkbox"/> | <input type="checkbox"/> | Graduated from high school |
| <input type="checkbox"/> | <input type="checkbox"/> | Attended college but did not complete degree |
| <input type="checkbox"/> | <input type="checkbox"/> | Completed an associate's degree (A.A., A.S., etc.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Completed a bachelor's degree (B.A., B.S., etc.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Completed a master's degree (M.A., M.S., etc.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Completed a doctoral degree (Ph.D., J.D., M.D., etc.) |

28 Please print your primary major or your expected primary major.

29 If applicable, please print your second major or your expected second major (not minor, concentration, etc.).

THANKS FOR SHARING YOUR VIEWS!

After completing the survey, please put it in the enclosed postage-paid envelope and deposit it in any U.S. Postal Service mailbox. Questions or comments? Contact the National Survey of Student Engagement, Indiana University, 1900 East Tenth Street, Eigenmann Hall Suite 419, Bloomington IN 47406-7512 or nsse@indiana.edu or www.iub.edu/nsse. Copyright © 2004 Indiana University.

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High School Survey of Student Engagement 2005

This survey asks questions about your high school experience – how you spend your time, what you have gained so far from your classes, your interactions with friends and teachers, and various activities. The information you provide will help teachers, administrators, and others improve conditions that contribute to your learning and development during high school. Thank you for your thoughtful responses.

Instructions: Please mark your answers in dark ink or pencil. Fill in the bubbles completely: ●

1. What is your grade in school?

- 9th 10th 11th 12th

2. In what grade did you start attending this high school?

- 9th 10th 11th 12th

3. How old are you today?

- 13 or younger 15 17 19
 14 16 18 20+

4. Are you Male Female

5. What is your racial or ethnic identification?
(Mark all that apply)

- Hispanic, Latino, or Spanish origin
 American Indian or other Native American
 Asian American or Pacific Islander
 Black/African American
 White
 Other, specify: _____
 Prefer not to respond

6. Is English the main language used in your home?

- Yes No

7. What have most of your high school grades been?
(Mark one response only)

- Mostly As Mixed Cs and Ds
 Mixed As and Bs Mostly Ds
 Mostly Bs Below D
 Mixed Bs and Cs Grades not used
 Mostly Cs Don't know

8. On average, how many hours do you sleep per night?
(Round to the nearest hour)

- Less than 5 5 6 7 8 9 10+

9. Which category represents most of your classes?
(Mark one response only)

- General/Regular Honors/College Prep
 Special Education Career/Vocational
 Courses for College Credit Don't know

10. Do you have a computer with Internet access at home?

- Yes No

11. How far do you think you will go in school?
(Mark one response only)

- Will not finish high school
 Certificate of completion without a diploma
 High school diploma
 2-year college degree (Associate's)
 4-year college degree (Bachelor's)
 Master's degree
 PhD or other advanced professional degree
 (law, medicine, etc.)
 Don't know

12. What is the highest level of education that your parent(s) or guardian(s) completed?
(Mark one response per column)

- | Father | Mother |
|-----------------------|---|
| <input type="radio"/> | <input type="radio"/> Did not finish high school |
| <input type="radio"/> | <input type="radio"/> High school diploma or GED |
| <input type="radio"/> | <input type="radio"/> 2-year college degree (Associate's) |
| <input type="radio"/> | <input type="radio"/> 4-year college degree (Bachelor's) |
| <input type="radio"/> | <input type="radio"/> Master's degree |
| <input type="radio"/> | <input type="radio"/> PhD or other advanced professional degree (law, medicine, etc.) |
| <input type="radio"/> | <input type="radio"/> Don't know |

13. During this school year, about how much writing have you done?

	0	1	2-3	4-5	6-7	8-10	11-14	15-19	20+
a. Number of written papers or reports of more than 5 pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Number of written papers or reports between 3 and 5 pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Number of written papers or reports of fewer than 3 pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. About how many hours do you spend in a typical 7-day week doing each of the following?

# of hours per week	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+
a. Preparing for class (doing homework, reading, rehearsing, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Doing volunteer work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Working for pay (including babysitting, cutting grass, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Watching television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Participating in school-sponsored activities (athletics, clubs, government, newspaper, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Chatting or "surfing" online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Hanging out/socializing with friends outside of school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Playing video games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Exercising (not counting school-sponsored activities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Talking on the phone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. a. How many days have you missed this school year?

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

b. How many were unexcused absences?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

16. How many times have you been late/tardy to class during the past month?

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. About how much reading do you do in a typical 7-day week?

# of hours per week	0	1	2-3	4-5	6-7	8-10	11+
a. Assigned reading (textbooks or other course materials)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Personal reading (books, magazines, newspapers, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Personal reading (online/web)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Thinking about this school year, how often have you done each of the following?

	Never	Sometimes	Often	Very often
a. Asked questions in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Contributed to class discussions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Made a class presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Prepared two or more drafts of a paper or assignment before turning it in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Received prompt feedback from teachers on assignments or other class work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. (Cont.) Thinking about this school year, how often have you done each of the following?

	Very often	Often	Sometimes	Never
f. Worked on a paper or project using information from several types of sources (books, interviews, Internet, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Included views of different races, religions, genders, or political beliefs in class discussions or assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Attended class with readings or assignments completed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Worked with other students on projects/assignments during class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Worked with other students on projects/assignments outside of class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Put together ideas or concepts from different subjects when completing assignments or participating in class discussions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Learned something from discussing questions that have no clear answers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. Participated in a community-based project as part of a regular class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. Enjoyed completing a task that required a lot of thinking and mental effort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. Used the Internet/web to complete an assignment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. Used e-mail to communicate with a teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. Discussed grades or assignments with a teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. Discussed ideas from your readings or classes with teachers outside of class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. Discussed ideas from your readings or classes with others outside of class (students, family members, coworkers, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t. Had conversations with students of a different race or ethnicity than your own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
u. Had conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. Fill in the responses that come closest to how you feel about each of the following statements.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
a. I take pride in my school work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I have the skills and abilities to complete my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I value the rewards (grades, awards, etc.) that I get at school for my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I feel supported and respected by the following people:					
- teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- counselors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- administrators (principal, assistant/vice principal)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- secretaries/administrative assistants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- other students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I get to make choices about what I will study at school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I have many opportunities to ask teachers questions about my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I have worked harder than I expected to work in school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I think school rules are fair.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I think it is important to make good grades.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. I help determine how my school work is evaluated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. I care about my school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. I place a high value on learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. I have a voice in classroom decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. I put forth a great deal of effort when doing my school work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. I have opportunities to be creative in my school assignments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. I think the things I learn at school are useful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. I feel safe in school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. The support I get at school encourages me to learn more.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. I am challenged to do my best work at school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t. Overall, people at school accept me for who I am.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
u. If I could select a high school, I would go to the same school again.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v. In general, I am excited about my classes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
w. There is at least one adult in my school who cares about me and knows me well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
x. My school work makes me curious to learn about other things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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20. During this school year, how much has your class work emphasized the following mental activities?

	Very much	Quite a bit	Some	Very little
a. Memorizing facts or ideas from your courses so you can repeat them in similar form	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Understanding information and its meaning; being able to explain ideas in pretty much your own words	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Applying information to new situations or real-world problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Analyzing/examining the basic parts of an idea or experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Organizing and combining ideas to form new meanings/relationships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Making judgments about the value of information or ideas; evaluating whether conclusions are sound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. To what extent does your school emphasize each of the following?

	Very much	Quite a bit	Some	Very little
a. Spending a lot of time studying and on school work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Providing the support needed to succeed in school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Preparing for standardized tests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Encouraging contact among students of different backgrounds and beliefs (race, religion, politics, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Participating in school events and activities (athletics, plays, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Using computers in class work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Providing helpful comments on student performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Encouraging students to explore new ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Recognizing academic excellence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Recognizing athletic achievement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Involving students in school leadership and governance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Treating students fairly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. Continuing your education (college, career training, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

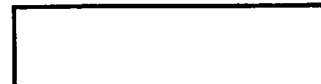
22. Which of the following have you done during high school?

	Yes	No
a. Traveled outside the state	<input type="radio"/>	<input type="radio"/>
b. Participated in community service or volunteer work	<input type="radio"/>	<input type="radio"/>
c. Taken the PSAT, SAT, or ACT	<input type="radio"/>	<input type="radio"/>
d. Received academic training/tutoring from an individual or organization outside of school	<input type="radio"/>	<input type="radio"/>
e. Taken one or more courses at a college or university	<input type="radio"/>	<input type="radio"/>
f. Taken one or more Advanced Placement (AP) courses	<input type="radio"/>	<input type="radio"/>
g. Participated in a co-op or work study program	<input type="radio"/>	<input type="radio"/>
h. Worked as an intern for a company or agency outside of school	<input type="radio"/>	<input type="radio"/>
i. Prepared a personal study plan with a teacher or counselor	<input type="radio"/>	<input type="radio"/>
j. Participated in an overnight school trip	<input type="radio"/>	<input type="radio"/>
k. Participated in the International Baccalaureate program	<input type="radio"/>	<input type="radio"/>
l. Taken one or more courses online	<input type="radio"/>	<input type="radio"/>

23. How much has your experience at this school contributed to your growth in the following areas?

	Very much	Quite a bit	Some	Very little
a. Learning work-related skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Writing effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Speaking effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Thinking deeply and critically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Using computing and information technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Working well with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Learning on your own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Understanding people of other racial and ethnic backgrounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Solving real-world problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Developing clear career goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Making your community a better place	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Preparing for college	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. Understanding yourself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. Developing personal values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

THANKS FOR SHARING YOUR VIEWS!



(wants to be like NSSE)

Technology and Student Success
IN HIGHER EDUCATION

McGraw-Hill Higher Education
2006 Summary Report

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(wants to be named like NSSE)

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Bloom's Taxonomy

Meanings of Bloom's Level of Questions

Levels	Definition	Verbs
Knowledge	Questions about <u>facts</u>	list, recall, memorize
Comprehension	Questions of <u>understanding</u> of facts	explain, reword
Application	Questions of <u>using</u> the facts	solve by, organize to prove
Analysis	Questions <u>taking apart</u> information	break down, compare, put into categories
Synthesis	Questions <u>putting together</u> information in a new way	create, compose, reorganize
Evaluation	Questions of judgment or <u>value</u> of information	rate, choose, justify

Grade 4 Example

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
<p>List all the video games you know.</p> <p>Match the name of video games to rules for playing them.</p>	<p>Explain how to play Pac Man.</p> <p>Restate in your own words the rules for the video game Centipede.</p>	<p>Use your knowledge about Donkey Kong to try to save the lady.</p> <p>Demonstrate some of the skills needed to save the girl in Donkey Kong.</p>	<p>Compare Different strategies to win the video game of Battle Zone.</p> <p>Break down the rules into simple steps needed to understand the game of Iron.</p>	<p>Create a new strategy to win at frogger.</p> <p>Design your own video game.</p> <p>Combine the ideas from two video games to make your own.</p> <p>Predict what will happen to kids who play video games.</p>	<p>Rank Pac Man scores for yourself and three of your friends.</p> <p>Defend Kids' rights to play video games.</p> <p>Recommend a video game to one of your friends.</p> <p>Decide which video game is your favorite.</p>

Knowledge Level I	Comprehension Level II	Application Level III	Analysis Level IV	Synthesis Level V	Evaluation Level VI
define	describe	apply	analyze	compose	appraise
find	discuss	calculate	compare-	construct	assess
identify	explain	demonstrate	components	design	choose
know	express	diagram	debate	develop	compare
list	identify	dramatize	deduce	formulate	and contrast
locate	interpret	employ	detect	hypothesis	decide
match	locate	extrapolate	differentiate	manage	estimate
memorize	recognize	graph	discover	organize	evaluate
name	report	illustrate	distinguish	originate	grade
recall	restate	operate	examine	plan	judge
recite	review	practice	experiment	produce	rank
relate	reword	schedule	infer	propose	rate
repeat	summarize	sketch	inventory		select
say	tell	solve	question		value
	translate	transfer	reduce		
		try	test		
		use			

Knowledge (get the basic facts)

list, match, write, recall, know, summarize, who, what, where, when, say in your own words, observe and write, memorize, arrange, put into categories, select, name, tell about, group, show, underline, find, choose, label, spell, pick, point to, say

Comprehension (understand the facts)

explain, show, demonstrate, change, reword, interpret, alter, transform, retell, account for, recognize, offer, propose, submit, define, translate, convert, expand, outline, vary, spell out, restate in your own words

Application (use the facts)

apply, select, solve by, organize, choose, interview, make use of, experiment with, try, operate, relate, put to use, handle, put into action, utilize, record, model, construct, demonstrate through, put together

Analysis (select, examine, and break apart by facts)

breakdown, inspect, divide, take away, dissect, put into categories, examine, uncover, survey, group, analyze, test for, study, classify, identify the parts for, search, clarify, discover, contrast, compare, simplify, take apart

Synthesis (put the basic information back together in a new way)

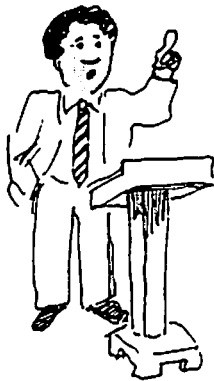
create, design, develop, discuss, build, imagine, compare, re-order, make, compose, combine, form, compile, blend, construct, predict, invent, reorganize, contrast, make up, estimate, suppose, rearrange, alternate, originate

Evaluation (value, judge, accept or reject facts)

rank, evaluate, rate, judge, measure, choose, criticize, justify, determine, conclude, grade, select, award, recommend, reveal, dispute, rule on, decide, defend

Bloom's Taxonomy

Knowledge	<p>Knowledge of specifics (What is the principal ingredient in the air we breathe?)</p> <p>Knowledge of ways and means of dealing with specifics (What steps would you have to take to become a licensed operator? What is the correct form for presenting a motion before a meeting?)</p> <p>Knowledge of universals and abstractions (What is the basic principle behind the operation of a free market?)</p>
Comprehension	<p>Translation (In your own words what does "laissez-faire economy" mean? What does it mean to say that to the victor belongs the spoils?)</p> <p>Interpretation (In what ways are the Democratic and Republican positions on support for the military budget similar?)</p> <p>Extrapolation (If the use of electrical energy continues to increase at the present rate, what will be the demand for electrical energy in A.D. 2000?)</p>
Application	<p>(If you measure the pressure in your barometer at the foot of the mountain and then measure it again at the summit of the mountain, what difference in the reading would you expect? If of two sailing vessels leaving New York at the same time en route to London one took a route following the Gulf Stream and one kept consistently south of the Gulf Stream, which would you expect to reach London first, everything else being equal?)</p>
Analysis	<p>(Questions that ask pupils to break complex ideas down into their component elements in order to make them more understandable.)</p> <p>Analysis of elements (Which part of the argument we have just read is fact and which is opinion? What propoganda devices can you find in this automobile advertisement?)</p> <p>Analysis of relationships (Does the conclusion that Senator X made logically follow from the facts he presented?)</p> <p>Analysis of organizational principles (In this poem what devices has the author used to build up the characters of the principal antagonists?)</p>
Synthesis	<p>Production of unique communication (Describe the procedure you used and the results you observed in the experiment.)</p> <p>Production of a plan or a proposed set of operations (How would you go about determining the composition of this unknown chemical?)</p> <p>Deviation of a set of abstract relations (You have heard the description of the situation. What might be the causes of this situation?)</p>
Evaluation	<p>Judgment in terms of internal evidence (In what ways is the argument presented illogically?)</p> <p>Judgment in terms of external criticism (Does the theory that organically grown foods are more healthful than other foods conform to what we know of the chemical composition of these foods? Explain)</p>



Drawings by Jim Hull

The Lively Lecture— 8 Variations

PETER J. FREDERICK

The lecture system to classes of hundreds, which was very much that of the twelfth century, suited Adams not at all. Barred from philosophy and bored by facts, he wanted to teach his students something not wholly useless.

—*The Education of Henry Adams*

The recent flurry of criticisms of higher education, although focusing on an integrated core curriculum and the development of fundamental competencies, all exhort professors and those who administer the faculty reward system to pay more attention to teaching and

higher order cognitive and affective capabilities in students, and promoting more active student "involvement" in their own learning.¹ Since both common sense and educational research indicate that these goals are more readily achieved in smaller rather than larger classes, a likely target of these calls for reform is the lecture.

Criticism of the Lecture

Although the *lektor* has been the primary medium of college and university instruction since the middle ages,

Studies on attention span suggest that after 15 or 20 minutes the lecture loses its effectiveness even in transmitting information.

learning. This means, among other things, increasing faculty "engagement" and interaction with students (especially in the first years of college), developing

The author is a professor of history and chair, Division of Social Sciences, at Wabash College in Crawfordsville, Indiana. The drawings were made by Jim Hull to accompany a demonstration/discussion by the author on the ideas in this article. That presentation was sponsored by the Teaching Resources Center at Indiana University in Bloomington.

in recent years it has been under assault not only by distinguished educational panels but also by student protestors, learning theorists, faculty development consultants, and even by (some) tenure and promotion committees. Faculty members have been bombarded with messages to lecture less and to use discussion and other innovative participatory methods of teaching more.

In the sixth edition of his influential book, *Teaching Tips*, Wilbert J. McKeachie concluded that although lectures are "sometimes an effective way of communicating information," he had "a suspicion, . . . supported by bits of evidence, that other methods of teach-

ing may be more effective than lecturing in achieving some of the higher level cognitive and attitudinal objectives."³ Reflecting a decade of further studies, Bette LaSere Erickson and Glenn R. Erickson emphatically state that "the lecture is less effective than other methods when instructional goals involve the application of information, the development of thinking skills, or the modification of attitudes."³

Attention span studies, for example, suggest that after 15 or 20 minutes the lecture loses its effectiveness even in transmitting information. Students, of course, routinely respond that lectures are "boring" and "worthless." Thus, as Henry Adams suspected 80 years ago, if a teacher wants to avoid being "wholly useless," it is best not to lecture.

Justification of the Lecture

Despite all the criticism, however, the lecture has withstood all assaults on its old, yellowed walls, standing up under the siege with battered but enduring strength. The onslaught has done more to cause faculty discomfort and guilt than actually to change practices. From within the safety of the old walls of tenure, tradi-

I'd like to try some new ideas, but I can't—I have 300 students in the class, you know.

tion, and expediency, faculty members continue to lecture. Only a tone of defensiveness hints at the battle outside. "I'd like to do less lecturing, but I've got too much to cover." Or, "that's all right for you but I have to lecture in my field." Or, "I'd like to try some new ideas, but I can't—I have 300 students in the class, you know." As salvos of rhetoric and reports fly back and forth across the parapets, life in the classroom goes on much as before. Most college professors, even those like myself who advocate a decentralized classroom, still spend more class hours "lecturing" than anything else.

For some good reasons. Other than the expediency of economy of scale, there are many reasonable justifications of the well-prepared, clearly organized, and dynamically delivered lecture. When done well, the best lectures:

- impart new information
- explain, clarify and organize difficult concepts
- model a creative mind at work or the problem-solving process

- analyze and show relationships among seemingly dissimilar ideas
- inspire a reverence for learning
- challenge beliefs and habits of thinking, and
- breed enthusiasm and motivation for further study.

To hear a good lecture is an inspiring experience. We leave with our imagination broadened and our interest piqued; we find ourselves entertained, prodded, and illuminated in turn. What evokes our response is an intricate blend of qualities. The lecture must have sufficient intellectual content to challenge us. . . . Like a dramatic monologue, it engages our emotions and keeps them in play, thanks to frequent shifts in mood and intensity. It mixes humor and erudition, and gives us a sense of the personal involvement of the lecturer. . . .⁴

In hearing a lecture like this, Henry Adams notwithstanding, students receive much more than useless facts. Such a lecture, as Emerson said in the "American Scholar" address in 1837, aims "not to drill, but to . . . set the hearts of youth on flame." Ideally, there is engagement, excitement, and intense interaction, albeit passively experienced by students, in the act of listening and recording notes during an inspiring lecture.

In battles over the lecture method, both sides err in holding up a single stereotyped image. Defenders of the lecture usually cite the fiery and inspiring version described above, acknowledging, however, that "in practice . . . too few lectures attain this ideal."⁵ Critics paint a dreary picture of the stodgy old pedant (or an uninspiring nervous young one) listlessly mumbling overly long and obtuse sentences read from crumbling, yellowed (or freshly word-processed) notes. Doubtless there are both important facts and gems of wisdom in Professor Mumble's tired words, but they are lost on most students who tune out early to fantasize last night's winning jump shot or the coming weekend's party. At its best, the lecture ends five minutes early as the professor asks, "Are there any questions?" There usually are not.

Neither image of the lecture serves us well. We need, I believe, to redefine the "lecture" in order to achieve the kind of involvement educators have agreed enhances student learning. The purpose of this essay is to suggest several such variations. Although disparate in approach, each variation is motivational; each imparts information; each engages students actively. It is my intention to show that interactive student participation is possible even in the traditional setting of large mass lecture classes in dimly lit halls with tiered rows of immovable seats bolted to the floor.

Other than the obvious importance of content mastery, traditional advice about giving lectures applies to each of the different forms described here. Objectives should be clearly stated and written down on the board with an outline of major topics to be "covered." One

should only make two or three major points in any given class, using several focused examples or experiences to illustrate each main idea. Students should be given specific assignments to practice their mastery of these ideas. Teachers should be sensitive to their audience, aware of its energy level, and prepared to adapt the level and form of presentation accordingly, varying the format for different class periods and often even within one period.⁶

Importance of Variety

There is no moment more important than when a professor decides—given a wide array of pedagogical variations from which to choose—that for *these* particular primary and secondary goals for *this* particular class period, *these* particular teaching and learning methods make the most sense. For example, if a new topic is to be introduced, the teacher might either deliver a traditional lecture filled with overarching themes and necessary groundwork information or present an emotionally charged film or multi-media show to arouse interest in the new topic. Or, if students' energy and enthusiasm have been noticeably declining, a teacher will want to structure a way of getting student participation and feedback in order to understand what they are thinking and feeling. Or, if a recent examination has revealed a widespread deficiency in some competency, a class period should be devoted to giving students either a model of or practice in that skill.

Deciding which goal and method is most appropriate for any given class—especially when recognizing that students have different learning styles and are at different stages of cognitive and moral development—is a vitally crucial moment for a teacher's effectiveness in enhancing student learning.

As different students learn from diverse approaches, so also are there diverse ways to be a "good" teacher. The point is to select that style most consistent with one's personality. Students are not fooled when we try to be something other than what we are. But at the same time, since we seek to stretch the ways students learn, they appreciate our openly avowed efforts to expand the ways we teach, even in ways we might initially find uncomfortable. It is in this spirit of guarded but willing experimentation that I hope we will approach these eight variations of a lecture.

1. The Exquisite Oral Essay

This is the traditional lecture, executed with the kind of excellence to which we all aspire—and once in a while achieve. The oral essay is a final polished work which skillfully treats a single intellectual question or problem. It has unity: the topic is introduced, illustrated, and concluded within fifty minutes; it does not spill over to the following Wednesday. Thus, the single class period

is an "intellectual experience" for the students as they listen in awe to the professor's "perfect" presentation. The purpose of this kind of lecture is not only to convey substantive information but also to demonstrate the professor doing well the job of professing. Students are treated to "a window on the teacher's mind," watching with much the same intensity that one has when observing an unusually skillful pianist or salesman. Our courses, no doubt, should include some of these performances, but not to the exclusion of other approaches. Oral essays reduce students to the role of passive auditors, at best engaged in an "internal dialogue," as David Bergman puts it, with the professor.⁷ Although the oral essay is inspirationally masterful, the students witness a finished product, not the process.

2. The Participatory Lecture.

Would it not be more instructive if students could observe, or better yet participate in, the creation of a lecture? Imagine a group of students clustered around the professor's cluttered desk as he or she prepares a lecture. On the desk are several sources and a crude outline. The students observe their professor deciding what purposes the lectures should fulfill and why certain substantive points and examples are chosen to emphasize and why others are discarded. To be a part of this exhilarating (and sometimes painful) process of creation is a genuine window on the mind at work. The lecture itself the next morning, by comparison, is but a show. Obviously, it is impossible to invite four hundred—or even

The important point is not the final chalkboard creation but the process. The participatory lecture requires less recording—and more thinking—than the oral essay.

forty—students into one's office or home for the time it takes to construct a good lecture. But can the process of creation be duplicated, or at least approximated, with student participation, in the classroom itself?

The participatory lecture is best described as orderly brainstorming in which students generate ideas which are then organized in some rational, coherent pattern on the chalkboard. When beginning a new topic, start with a participatory lecture by inviting students to brainstorm together by calling out "everything you know about World War I" (or Freud, Darwinism, China, waves and particles). As recorded on the blackboard (or

on an overhead projection), a list will unfold of a mixture of specific facts, impressionistic feelings and prejudices, and possibly even interpretive judgments. Students bring to most courses both some familiarity and considerable misinformation, both of which can be ascertained in a participatory lecture.

The only rule of brainstorming is to acknowledge every offering by writing it down. As ideas are pro-

The mini-lecture and discussion format counters the attention span problem by making 15–20 minute shifts in energy from the teacher to students and back again.

posed, you might even arrange what you hear in rough categories, but tell the students what you're doing lest you be suspected of manipulating their contributions. Better yet, once the board is filled, ask students to suggest categories and to comment on the accuracy and relative importance of the array of facts, impressions, and interpretations. Refinements can be dealt with by use of the eraser, a luxury not allowed in the formal lecture. The action of an evolving creation on the chalkboard, especially for the visually oriented learners of the television generation, reinforces learning far better than the lost words of an entirely auditory presentation.

When the class is over, an organized configuration of the ideas contributed by both students and instructor will appear on the chalkboard. Ask one student to take notes so you can run off copies for the class. The important point, however, is not the final chalkboard creation but the process. The participatory lecture differs from the oral essay by requiring more thinking and less recording. Ideally, students spend their time not transcribing or doodling but concentrating on contributing

to the evolving creation in front of them. Obviously, the participatory lecture can be done badly. When students have not brought to the class the limited knowledge provided by their prior experience or reading, or when the professor manipulates student statements to a rigidly preconceived schema, the experience can be dreary.

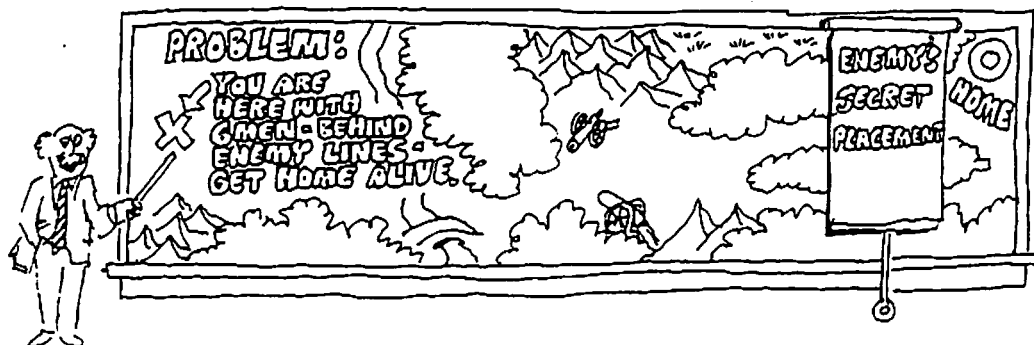
But when the mutual participation is free and open, students are actively engaged and teachers might even learn new insights about familiar material. Roles are blurred and all become learners and teachers. Although obviously less efficient than an oral essay, what is important is that the participatory lecture involves many students actively and *can be done with large classes*.

In a sense, all the remaining variations are versions of the participatory lecture and involve varying degrees of faculty-student interaction. It is the presence of *some* interaction, especially in large lecture courses, that students and recent critics of undergraduate education have been calling for. Martin J. Finklestein's synthesis of recent research on student evaluations concludes that "the teaching practices that a faculty member adopts in the classroom are clearly and strongly related to perceived teaching effectiveness." In defining teaching effectiveness, students consistently rate highest those faculty who show respect for students and their progress, who pay attention to classroom processes, and who use presentational styles that encourage participation.⁸

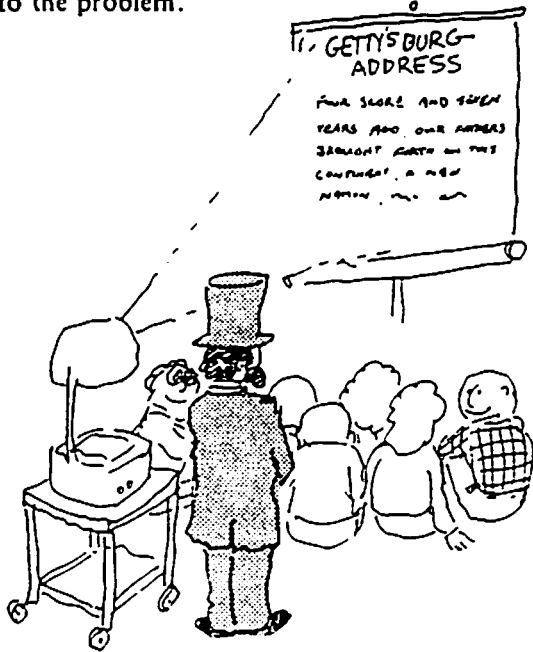
3. Problem Solving: Demonstrations, Proofs, and Stories

What brought the two former friends, one in blue and one in grey, to oppose each other on Cemetery Ridge in Gettysburg that hot July afternoon?

This lecture begins with a question, or a paradox, or an enigma, or a compellingly unfinished human story—some tantalizing problem that hooks student interest. The answer unfolds during the class hour; if skillful the unfolding will be completed with only about ten or fewer minutes left in the period. Solving the problem, depending on what it is or in what field, may require a scientific demonstration, a mathematical proof, an economic model, the outcome of the novel's plot, or an his-



torical narrative. The question is woven throughout the lecture, inviting students to fill in imaginative spaces in the story (or model) with their own unfolding solutions to the problem.



The unfolding can consist primarily of a lecture, in which students fill in their successive answers passively, or of an interactive process in which students' tentative solutions to a problem, or completions of a story, are elicited, listed on the board, and discussed. "What do you think will happen?" "Which solution, outcome, or explanation makes the most sense to you?" If no consensus, the teacher lectures a little more, invites a new set of student responses, and asks the question again. Ideally, when the problem is finally resolved, most students will have figured it out themselves just before the teacher's solution is announced.

4. Energy Shifts: Alternating Mini-Lectures and Discussions

I firmly believe that the flow of energy around a classroom has a great deal to do with how well students learn. The following variation, which is similar to the participatory and problem-solving lectures, recognizes the conclusions of attention span studies by making clearly delineated 15-20 minute shifts in energy from the teacher to students and back again. The instructor begins with a 20-minute lecture setting the stage for some issue, which involves a 10-15 minute discussion of implications and effects, followed by another mini-lecture on what happened next. The last 5 minutes might be spent by presenting students with an assignment: a problem or application of the issues raised in the second mini-lecture. Thus, the next class would begin with the mini-discussion, followed by a mini-lecture, etc. This alternating approach can describe any natural or social

science class where instruction calls for a mixture of theory and data, model and findings, or hypothesis and experimental demonstration, with intervening considerations of how best to proceed next. The point is to shorten segments of one method of learning, change the voices(s) heard, and shift the energy.

In a lecture hall filled with 200-400 students, the mini-discussions need not involve "breaking up into groups of five or six" (as they well might in smaller classes of 100 or less). Rather, huge classes can be handled by asking two or three students sitting next to each other to discuss the problem together for a few minutes, and then inviting volunteers to stand and report conclusions and concerns. This process provides public affirmation of the appropriate issues (or not), thus giving feedback both to other students and to the teacher on how well the students were prepared for a particular problem. Even "wrong" feedback is instructive and sharpens the focus of the next appropriate mini-lecture and reading assignment. Without the mini-discussion segment, the teacher might not have known the gaps in student knowledge and gone ahead with the next lesson, which is most serious in sequential science courses. Moreover, with energy shifts students experience a variety of voices and a sense of shared responsibility for their learning.

5. Textual Exegesis: Modeling Analytical Skills

Jennifer, would you read the top paragraph on page 40 please?

One deficiency of undergraduate education we have been hearing about (and often experiencing) is that our students are illiterate. They do not know how to read, we are told, which is a rather necessary prerequisite for developing analytical skills. The lecture setting of any size provides an opportunity to practice an old-fashioned but underused technique: *explication du texte*. We do not often enough go to a text and read and analyze passages together out loud. Students can develop these skills by seeing them modeled, followed by an opportunity to practice analyzing a text themselves.

A class of 50 or 500 students, following along in their books, or on handouts, or on an overhead projection, can watch a professor working through selected passages of a document, speech, sermon, essay, poem, proof, or fictional passage. Upon reaching a particularly ambiguous passage, the mini-discussion in groups of 3-5 students could be employed, thus shifting the energy and providing practice and feedback for students. The professor's response to how different groups of students resolve the ambiguity ("What is Locke saying here?") furthers the learning.

This process of modeling how to read analytically can be done for other than just verbal texts. Art historians,

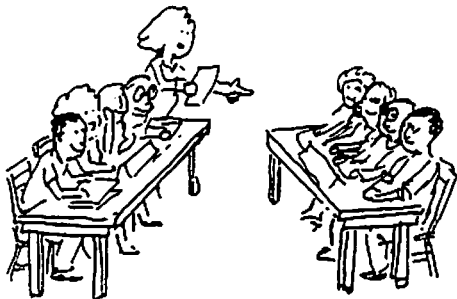
musicologists, economists, and anthropologists have traditionally used lectures to show students how to "read" an abstract painting, sonata, supply and demand curve, or artifact. Natural scientists explain their "texts" with elaborate demonstrations (and labs for practice). What I am suggesting is that in those many courses where the mastery of traditional verbal texts is fundamental to the learning goals of the course, we use the lecture period as an opportunity to teach critical interpretation and analysis to our students—that is, how to read.

A further variation on this approach, especially for social science courses, is to use the lecture period to train students in other analytical skills—quantitative analysis of graphs, charts and tables, and how to read maps, interview schedules, or census and polling data. In sum, make sure students have a copy of the document in question in front of them (or visual access through slides and overhead transparencies), and then follow three steps: modeling by the professor, practice by the students, and feedback.

6. Cutting Large Classes in Half without Losing Control: Debates

"But my class is too large for these gimmicks!" "I couldn't possibly let them go into those little groups in the middle of class. I wouldn't trust what they're talking about and am afraid I'd lose control."

Although assigning specific tasks to small groups of two or three students can disperse energy and achieve interaction in large classes, not all instructors would be comfortable with the uncertainty of "what they're talking about." The concern for control is a genuine and important one. Although once we open up the lecture



hall to voices other than our own we risk some diminished control over content and tone, none of these variations is intended to relinquish the teacher's control of the class. Therefore, let me suggest a few ways of achieving more student participation and engagement in large classes without changing the professor's central and vital controlling role in the classroom.

One obvious strategy is to take advantage of the central aisle dividing large lecture halls in order to structure debates. Students can either support the side of an issue assigned to the half of the hall where they happen to be

sitting, or as prearranged, come to class prepared to take a seat on one particular side of a debate. Whichever approach you use, you can maintain rigorous control from the podium in guiding the process: "From the right side of the hall we will hear five statements on behalf of the Confederacy, after which we will hear five statements from the left on behalf of the Union." The process can be repeated once or twice, including the inevitable rebuttals, before concluding by asking for two or three volunteers to make summary arguments for each side.

Although neither one of two polar sides of an issue contains the whole truth, it is pedagogically energizing and valuable (if only to point out the complexity of truth) for students to be compelled to choose and then to defend one side of a dichotomous question. Other obvious debate topics include such questions as: "Burke or Paine?" "Should Nora have left or stayed?" "Pro-life or pro-choice?" "Marx or Adam Smith?" "Waves or particles?" "Declare war or not?"

"But most important questions do not divide into halves. . . . My students would never settle for forced choices."

When some students (quite rightly) refuse to choose one side or the other, create a middle ground and space and invite their reasons for choosing it. Students might learn how difficult it is to try to remain neutral on heated issues, especially during revolutionary times. Besides, some large lecture halls have two central aisles, which makes legitimizing a third position both intellectually defensible and physically possible. Whichever approach is used in dividing classes, the professor has maintained control and a central focus and students have added a participatory dimension to their learning in a traditional lecture setting.

7. Smaller Groups in Large Classes: Simulations and Role Playing

For those teachers willing occasionally to risk a little classroom chaos, the following variation is guaranteed to add energy, participation, and interaction to large lecture hall courses. I have written previously in this journal in more detail about using small groups and role-playing in history classes,⁹ so here I will just sketch the outlines of this "lecture" variation. It is adaptable (often as simulations) to political science, economics, sociology, and other disciplines.

First, a crucial mini-lecture clearly establishes the context and setting for the role playing (defined as a loose simulation of actual actors and problems). Second, the class is divided into a number of small groups (of varying sizes and including duplicate roles depending on the overall class size), each group assigned a clearly delineated role—usually of some historical or contemporary group. Third, each group is given a

specific, concrete task—usually to propose a position and course of action. And fourth, the proposals emanating from different groups will inevitably conflict with each other in some way—ideologically, tactically, racially, regionally, or over scarce funds, land, jobs, power, or resources.

The format of such sessions can take whatever direction a professor wishes, given clear planning and instructions, assertive leadership, and a lot of luck. One

The first is based on Martin Duberman's 1960s drama, *In White America*, in which the historian-playwright skillfully pieced together actual quotations from the black historical experience in white America into a compellingly gripping drama. None of us is a Duberman or Arthur Miller, but we all have an eye (or a heart) for particularly moving quotations, poems, or song lyrics. Focusing on a single topic (e.g., male-female stereotypes, the Depression, work, the nature of

Sometimes it is better for the emotional impact of the music and images to conclude the class, letting students leave the room with their hearts thumping . . . and their motivation to study aroused.

might hear the proposals of different groups and immediately incorporate them into a lecture on what really happened or should happen as a result of these same conflicts and collisions. Or, one might carry out the role-playing process longer by structuring the stages of a meeting or convention that followed the initial proposals. The student groups might, for example, be instructed to prepare speeches and see the deliberations through to some conclusion, or to caucus in order to develop strategies, coalitions, and tactics for achieving their goals. Neat, simple, clear closures are not easy (short of the class-ending buzzer), but this variation for large lecture classes has tremendous potential for experiential learning and of course involves enormous energy and interaction.

When the professor wishes to bring closure, however, debriefing the exercise—which is essential—is an opportunity to restore order. The debriefing also helps to identify what was learned, and to make the transition to the next topic and pedagogical approach, probably a lecture to tie up loose ends.

8. "Bells and Whistles": The Affective, Emotional Media Lecture

Every time a colleague sees me heading off to class with my cassette recorder, and slide carousel, he says, "here come the bells and whistles." It is not intended as a compliment. No list of variations for large lecture classes is complete without acknowledging the use of media. Since much has been written on the use of films and other audio-visual techniques in teaching, I want to focus on two approaches designed to evoke an emotional involvement by affective, emotional learning, an area woefully neglected in college teaching.

warfare, or Chinese culture), put together a collage of quotations, not necessarily in any particular order. Invite some theater majors or an oral interpretation class (or some of your own students) to read the quotations in class one day, either as an extended presentation followed by a short discussion, or as a brief introduction to your lecture on the topic.

The second affective media suggestion is the synchronized slide-tape presentation, consciously matching a series of visual images with the words of a song or speech. One need not prepare a spectacular show with multiple slide images emanating from several automatically timed projectors. Rather, select two or three songs or a speech that you think captures the mood or tone of an event, era, or issue, and select some slides to represent the words, changing as each new idea in the lyrics calls for a corresponding visual image.

To be sure, the presentation, especially with music, is a blatant ploy to hook student emotions in order to arouse their interest. But there is also extensive content inherent in the visual images and lyrics. After showing five minutes of 20–25 slides to accompany two haunting Harry Chapin songs on what has happened to America since the 1960s, we go back over each slide and talk about the historical context and the meaning of each line of the lyrics, which students have on a handout. The discussion could last for hours. Sometimes though, it is better for the emotional impact of the music and images to conclude the class, letting students leave the room with their hearts thumping, their minds engaged, and their motivation to study aroused. Which, after all, has been the goal of each of these lecture variations.

It must be clear that putting together a slide-tape presentation, or a small group role-playing experience, or

even a participatory lecture, takes planning time and effort, probably about as much as an exquisite oral essay or even an ordinary lecture, the one we know "could have been better but will have to do." It is important to use *all* of these different variations of the lecture, broadening our options as teachers by selecting what works for us. "The test of a good teacher," someone has said, "is how well Plan B works." To have a good Plan B for each major concept implies, of course, enlarging our repertoire.

Above all, I have sought to show in this article that large lecture hall classes need not be barriers to providing the kind of interactive, participatory experiences that enhance student learning and renew faculty commitment to the highest challenges of our calling. And who knows, after using a variety of approaches which involve students actively in the classroom, one could even finish a 30-minute lecture to a large class and ask, "Any questions?"—and be pleasantly surprised by the response.

NOTES

1. See *Integrity in the College Curriculum: A Report to the Academic Community*, Association of American Colleges, 1985; *Involvement in Learning: Realizing the Potential of American Higher Education*, National Institute of Education, 1984; and William J. Bennett, *To Reclaim a Legacy: A Report on the Humanities in Higher Education*, National Endowment for the Humanities, 1984.

2. Wilbert J. McKeachie, *Teaching Tips—A Guidebook for the Beginning College Teacher*, 6th edition (Lexington, Mass.: D.C. Heath and Co., 1969), p. 36.

3. Bette LaSere and Glenn R. Erickson, "Presenting and Explaining," unpublished manuscript, University of Rhode Island Instructional Development Program, 1984, p. 1.

4. Heather Dubrow and James Wilkinson, "The Theory and Practice of Lectures," in *The Art and Craft of Teaching*, Margaret Morganroth Gullette, ed., Harvard-Danforth Center for Teaching and Learning (Cambridge, Massachusetts: Harvard University Press, 1984), p. 25.

5. Dubrow and Wilkinson, *Art and Craft of Teaching*, p. 25.

6. Bette LaSere Erickson and Glenn Erickson's "Presenting and Explaining" contains an excellent set of specific "recommendations for planning effective presentations," p. 9.

7. David Bergman, "In Defense of Lecturing," *Association of Departments of English Bulletin* 76 (Winter, 1983), pp. 49-50.

8. Martin J. Finkelstein, *The American Academic Profession—A Synthesis of Social Scientific Inquiry Since World War II* (Columbus: Ohio State University Press, 1984), pp. 109 ff.

9. Peter Frederick, "The Dreaded Discussion: Ten Ways to Start," *Improving College and University Teaching* 29 (Summer 1981), 109-11

Simulation-Based Learning by Doing	This architecture aims to have students learn every possible skill through learning by doing. Because the doing of the task is what prepares the student for real life, it is important that the student be able to actively engage in such tasks. Simulations of all kinds can be built, although the challenge of designing high-fidelity simulations should not be underestimated. The Simulation-Based Learning by Doing Architecture is critical when the subject matter to be learned is experiential at heart. Of course, much of natural learning is the accumulation of experience.
Incidental Learning	Not everything is fun to learn. In fact, some things are terribly boring to learn. But people do habitually learn a variety of information that is quite dull, without being completely bored by it. Often, they do this by picking up the information "in passing," without intending to learn the information at all. The Incidental Learning Architecture is based on the creation of tasks whose end results are inherently interesting, and which can be used to impart dull information.
Learning by Reflection	Sometimes a student doesn't need to be told something, but rather needs to know how to ask about it. It could be that the student has a vague plan he/she wishes to mull over. Or perhaps the student has a problem and needs to figure out a way to approach it. Or maybe the student has finished a project and wishes to think back on how the project could have been done better. In such cases, a teacher's job is to open the student's eyes to new ways of thinking about the situation, to help the student articulate the situation and generate ways of moving forward.
Case-Based Teaching	This architecture depends upon these two ideas: experts are repositories of cases, and good teachers are good storytellers. The task of this architecture is to tell students exactly what they need to know when they need to know it. When students are learning by doing, they experience knowledge failures, times when they realize that they need new information in order to progress. These are the times when Case-Based Teaching can provide the knowledge that students need. Isolated facts are difficult for students to integrate into their memories; useful knowledge is typically best presented in the form of stories.
Learning by Exploring	The previous architectures deal with the difficult problems of getting students involved in their own learning and letting them learn through performing tasks that they care about. Students naturally generate questions, and they are ready to learn from those questions. An important method of teaching is to answer a student's questions and carry on a conversation about the issues in the questions, answering whatever follow-up questions the student generates. The Learning by Exploring architecture is intended to provide such answers in a conversational format.

* Figure 1.1. The five teaching architectures defined by Schank and Cleary (1995).

Schank (1997) *Virtual Learning: A Revolutionary Approach to Building a Highly Skilled Workforce*

BONK & SMITH (1997)

Table 1
Characteristics of consultative and traditional styles of teaching

Consultative Style	Traditional Style
<p>1. Teaching: Varied, comprehensive, collaborative, and interactive. Teaching for thinking. Teacher is a co-learner, resource, mentor, guide, coach, team builder, facilitator, tour guide, etc.</p>	<p>1. Teaching: Objectively-based lectures and individual worksheets/seatwork. Teaching is structured and narrowly focused for knowledge acquisition. Teacher is a manager, conveyer, "King of the Mountain."</p>
<p>2. Learning: Student- and problem-centered. Individual learning needs and preferences are addressed. Emphasis on active learning, solving problems, student autonomy, peer dialogue, choice, responsibility, ownership, knowledge generation, linking new knowledge to old. Acquisition of conceptual understanding and problem solving processes.</p>	<p>2. Learning: Largely teacher- and text-centered. Students seen as homogeneous. Emphasis on passive learning and discrete knowledge acquisition without interconnections among topics, subjects, courses, or disciplines. Acquisition of facts, rules, standards, and procedures.</p>
<p>3. Learning Metaphor: Learner is a growing tree or a pilgrim on a journey.</p>	<p>3. Learning Metaphor: Learner is a sponge.</p>
<p>4. Knowledge: Knowledge is constructed by students and intertwined across subject areas.</p>	<p>4. Knowledge: Knowledge is transmitted and acquired in a piecemeal fashion.</p>
<p>5. Curriculum: Interdependent courses with a focus on transferring knowledge across course situations. Textbook is one resource among many including peers, experts, technology tools, instructors, and assessment.</p>	<p>5. Curriculum: Sequential courses are not explicitly related to one another. Textbook content, curriculum guides, objectives, and instructor notes dominate classroom activities.</p>
<p>6. Assignment Orientation: Authentic, real-world tasks and problems with challenges and options. Focus on thinking skill development and teamwork or sharing of findings.</p>	<p>6. Assignment Orientation: Emphasis on correctly and individually solving fictitious exercises and problems from texts. Minimal student selection or input.</p>
<p>7. Assessment: Continual, less formal, subjective, collaborative, and cumulative. Uses authentic portfolio and performance-based measures with higher-order thinking skill evaluation criteria or scoring rubrics.</p>	<p>7. Assessment: Individual, competitive, objectively-based evaluation stresses test memorization skills and building factual knowledge. Unlikely barometer of future workplace success.</p>
<p>8. Potential Outcomes: Critical and creative thinking skills as well as appreciation of collaboration and teamwork. Motivated, proud, metacognitively-aware, and independent, life-long learners.</p>	<p>8. Potential Outcomes: Narrow band of cognitive skills and knowledge. Lacking interconnections across topics. Externally motivated with minimal learning responsibility and pride in one's work.</p>

page 63

Images of Schools (Workplaces) Through Metaphor (ISM): Actual Form

Directions: Think about where you work or teach. What is it **actually like** working at this place? Indicate the extent to which you agree/disagree with each of the following 40 metaphors. Rate on a scale of 1 (Strongly Disagree) to 10 (Strongly Agree).

- 1. My school (workplace) is a Mental Straight-jacket.
- 2. My school (workplace) is a Military Camp.
- 3. My school (workplace) is a Ghetto.
- 4. My school (workplace) is a Prison.
- 5. My school (workplace) is a Family.
- 6. My school (workplace) is an Artist's Palette.
- 7. My school (workplace) is a Team.
- 8. My school (workplace) is a Negotiating Area.
- 9. My school (workplace) is a Culture.
- 10. My school (workplace) is an Exhibition.
- 11. My school (workplace) is an Orchestra.
- 12. My school (workplace) is a Garden.
- 13. My school (workplace) is an Expedition.
- 14. My school (workplace) is a Herd.
- 15. My school (workplace) is a Museum.
- 16. My school (workplace) is a Machine.
- 17. My school (workplace) is a Hospital.
- 18. My school (workplace) is a Nursery.
- 19. My school (workplace) is a Labor Ward.
- 20. My school (workplace) is a Beehive.
- 21. My school (workplace) is a Living Organism.
- 22. My school (workplace) is a Theater.
- 23. My school (workplace) is an International Airport.
- 24. My school (workplace) is a Refuge.
- 25. My school (workplace) is an Ocean.
- 26. My school (workplace) is a Board Game.
- 27. My school (workplace) is a Camping Trip.
- 28. My school (workplace) is a Court Room.
- 29. My school (workplace) is a Monastery.
- 30. My school (workplace) is a Pressure Cooker.
- 31. My school (workplace) is a Fraternity Party.
- 32. My school (workplace) is an Olympic Games.
- 33. My school (workplace) is a Brew Pub.
- 34. My school (workplace) is a Zoo.
- 35. My school (workplace) is an Amusement Park.
- 36. My school (workplace) is a Casino.
- 37. My school (workplace) is a Tour Bus.
- 38. My school (workplace) is a Theme Park.
- 39. My school (workplace) is a Video Arcade.
- 40. My school (workplace) is a Laboratory.

Images of Schools (Workplaces) Through Metaphor (ISM): Ideal Form

Directions: Think about where you work or teach. What would you ideally want this place to be like? Then indicate the extent to which you agree/disagree with each of the following 40 metaphors. Rate on a scale of 1 (Strongly Disagree) to 10 (Strongly Agree).

- ___ 1. My school (workplace) is a Mental Straight-jacket.
- ___ 2. My school (workplace) is a Military Camp.
- ___ 3. My school (workplace) is a Ghetto.
- ___ 4. My school (workplace) is a Prison.
- ___ 5. My school (workplace) is a Family.
- ___ 6. My school (workplace) is an Artist's Palette.
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- ___ 37. My school (workplace) is a Tour Bus.
- ___ 38. My school (workplace) is a Theme Park.
- ___ 39. My school (workplace) is a Video Arcade.
- ___ 40. My school (workplace) is a Laboratory.

Metaphorical Thinking
Bonk, 2003

a. How is life like a supermarket?

b. How is my school/workplace like a(n): prison, beehive, orchestra, ghetto, expedition, garden, family, herd, artist's palette, military camp, Olympic game, hospital, theater, etc.?

c. How is watching IU play basketball under Coach Davis like taking the GRE exam?

d. How is this class similar to speed skating at the Winter Olympics (or perhaps figure skating, bobsledding, downhill skiing, ice hockey, snowboarding)?

The (Not So) Shifting Views of Human Learning

A. In the 60's there was discovery learning:

1. Environment must be free from threats, psychologically safe, and open communication.
2. Whole-person learning, person-centeredness, and student-centered curriculum.
3. In changing world, students need learn how to learn.
4. Learning must be purposeful, relevant, and meaningful.
5. Learners need exciting and challenging learning environment.
6. Children are inner directed, eager to learn, and motivated to self-actualize.
7. Use discovery/inquiry learning with free choices and self-initiation.
8. Peer tutoring and collaboration is important.
9. Teachers are facilitators and resources.
10. Educ responsive to affective needs: genuine realness, trust, respect, empathy, openness.

B. In the 70's and 80's, there was the cognitive revolution & active/constructivistic learning:

Constructivistic Teaching Principles (Brooks, 1990)

1. Give students choice and decision making in learning activity.
2. Make learning relevant and create tangible products.
3. Ask for personal theories and build on student prior knowledge.
4. Tell them purpose and goals to increase motivation.
5. Student autonomy and active learning encouraged.
6. Use of raw/primary data sources and interactive materials.
7. Allow student thinking to drive lessons.
8. Encourage student dialogue and reflection on experiences.
9. Seek elaboration on responses and justification.
10. Pose contradictions to original hypotheses.
11. Ask open-ended questions and allow wait time.
12. Discover relationships and create metaphors.
13. Organize info around concepts, problems, misconceptions, and discrepant situations.
14. Use small group, cooperative/peer learning, and social interaction.
15. Teacher as co-learner, but have audience beyond teacher.

C. Now, in the 90's, there is a focus in learner-centered curriculum (Nederland High Video) (Summary of the 12 Learner-Centered Psychological Principles (APA/McREL, 1993) (call McREL: For Our Students: For Ourselves (303) 337-0990; \$79.00?)

- a. Watch tape (a) circle items see in tape; (b) write down keyword descriptors or ideas

Metacognitive and Cognitive Factors:

1. Learning is a natural process of discovery
2. Learners seek meaningful knowledge
3. Learners construct and link new info to old.
4. Higher-order strategies oversee thinking.

Affective Factors:

5. Information processed depends on motivation and beliefs and expectations.
6. Learners are naturally curious and enjoy learning.
7. Need relevant/authentic learning tasks of optimal difficulty and novelty.

Developmental and Individual Differences:

8. Individuals progress through developmental stages.

Personal and Social Factors:

9. Learning is facilitated by social interactions in diverse settings.
10. Learning & self-esteem increase in respectful/genuine environments.
11. Learners have preferences for learning mode/strategies.
12. Personal beliefs are basis for constructing reality.

II. Key Humanistic Principles (FOCUS: Why they should do this) (Maslow, Combs, & Rogers)


1. Free choice
2. Inner directed
3. Motivated to self-actualize
4. Educ is responsive to affective needs
5. Genuine student concern, respect
6. Facilitate st self-actualization
7. Exciting & challenging lrng envir
8. Student-centered curriculum
9. Accept lrnrs needs & purposes
10. Open & personal environment

B. Per Carl Rogers: Freedom to Learn

1. Children are inherently eager to learn
2. Envir must be free from threats, psych safe, open commun
3. Learning is purposeful and self-initiated
4. Discovery/Inquiry learning
5. Whole-person learning, Person-centeredness
6. Seek relevant/meaningful Learning
7. In changing world need learn how to learn
8. Peer tutoring and collab is impt.
9. Tchrs as lrng facilitators, resources
10. Genuine realness, trust, respect, empathy

Seven fundamental principles of learning

The Institute for Research on Learning (IRL). (Kahn, 1993):

- 1. LEARNING IS FUNDAMENTALLY SOCIAL** —
(i.e., link learning and social fulfillment).
- 2. KNOWLEDGE IS INTEGRATED INTO THE LIFE OF COMMUNITIES.**
(i.e., activity, knowledge, and the social world are linked).
- 3. LEARNING IS AN ACT OF MEMBERSHIP**
(i.e., learning is engagement with others).
- 4. KNOWING IS ENGAGEMENT IN PRACTICE** — 
(i.e., concrete learning over abstract).
- 5. ENGAGEMENT IS INSEPARABLE FROM EMPOWERMENT**
(i.e., identity from contributions).
- 6. FAILURE TO LRN IS NORM RESULT OF EXCLUSION FROM PARTIC**
(i.e., learning requires access and opportunity).
- 7. WE ALREADY HAVE A SOCIETY OF LIFELONG LEARNERS**
(i.e., we are learning all the time, and we should learn for some benefit)

Constructivist Teaching Practices
John Savery, 1994
(updated by Bonk, January 2003)

1. Foster student autonomy, initiative, and leadership.
2. Use manipulative, interactive, and physical materials.
3. Use raw data and primary sources.
4. Allow student thinking to drive lessons and adapt content based on student responses; capitalize on student interests and motivation.
5. Inquire about student understanding prior to sharing your pt of view.
6. Look for alternative conceptions, design lessons to address any misconceptions.
7. Frame tasks by using global and specific terms like “classify” and “predict” as this helps students organize their thinking.
8. Encourage articulation and dialogue among students.
9. Pose contradictions to student views and play devil’s advocate.
10. Promote inquiry and ask open-ended questions.
11. Allow wait-time after posting questions.
12. Provide time for the discovery of relationships and the creation of metaphors.
13. Seek elaboration and clarification (e.g., illustrations and examples) of students’ responses.
14. Encourage reflection on experiences and then predictions of outcomes.
15. Cluster lessons around themes, problems, questions, and situations regarding similar concepts.
16. Adapt cognitive demand of the task to student cognitive schemes.
17. Foster student sharing, collaboration, and communication.
18. Allow opportunities for students to design or build knowledge and work toward a final tangible product or goal.
19. Allow for student choice and opportunities to address personal interests, relevancy, and meaningfulness.
20. Create an ethos or atmosphere for the joint sharing or products and the development of communities of learners.
21. Support student learning through demonstrations, hints, cues, and overall facilitation or moderation of their learning; later gradually take away the scaffolds.
22. Authentic or real-world problems should drive lessons with opportunities for audiences outside the designated teacher.

Table 1. Learner-Centered Psychological Principles Revised

For a full text of the principles listed as well as additional rationale and explanation, call or write to the American Psychological Association (APA) for the December, 1995 report "*The Learner-Centered Psychological Principles: A Framework for School Redesign and Reform*" (Note: the following summary of the 14 LCPs appeared in the *Newsletter for Educational Psychologists*, Learner-centered psychological principles revised (1996), 19(2), 10).

Cognitive and Metacognitive Factors

1. **Nature of the learning process.** The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience.
2. **Goals of the learning process.** The successful learner, over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge.
3. **Construction of knowledge.** The successful learner can link new information with existing knowledge in meaningful ways.
4. **Strategic thinking.** The successful learner can create and use a repertoire of thinking and reasoning strategies to achieve complex learning goals.
5. **Thinking about thinking.** Higher order strategies for selecting and monitoring mental operations facilitate creative and critical thinking.
6. **Context of learning.** Learning is influenced by environmental factors, including culture, technology, and instructional practices.

Motivational and Affective Factors

7. **Motivational and emotional influences on learning.** What and how much is learned is influenced by the learner's motivation. Motivation to learn, in turn, is influenced by the individual's emotional states.
8. **Intrinsic motivation to learn.** The learner's creativity, higher order thinking, and natural curiosity all contribute to motivation to learn. Intrinsic motivation is stimulated by tasks of optimal novelty and difficulty, relevant to personal interests, and providing for personal choice and control.
9. **Effects of motivation on effort.** Acquisition of complex knowledge and skills requires extended learner effort and guided practice. Without the learner's motivation to learn, the willingness to exert this effort is unlikely without coercion.

Developmental and Social Factors

10. **Developmental influences on learning.** As individuals develop, there are different opportunities and constraints for learning. Learning is most effective when differential development within and across physical, intellectual, emotional, and social domains is taken into account.
11. **Social influences on learning.** Learning is influenced by social interactions, interpersonal relations, and communication with others.

Individual Differences

12. **Individual differences in learning.** Learners have different strategies, approaches, and capabilities for learning that are a function of prior experience and heredity.
13. **Learning and diversity.** Learning is most effective when differences in learners' linguistic, cultural, and social backgrounds are taken into account.
14. **Standards and assessment.** Setting appropriately high and challenging standards and assessing the learner as well as learning progress—including diagnostic, process, and outcome assessment—are integral parts of the learning process.

Learner-Centered Strategies:

- Peer teaching/tutoring,
- Mentoring,
- Cooperative learning,
- Interdisciplinary learning,
- Service learning,
- Building relationships,
- Inclusion,
- Higher-order thinking strategies,
- Multiple intelligences,
- Performance/authentic assessment,
- Project-based learning,
- Electronic networking,
- Computer-based technologies,
- Self-assessment and self-monitoring.

Learner-Centered Characteristics:

- Choice,
- Responsibility,
- Relevancy,
- Challenge,
- Control,
- Connection,
- Competence,
- Respect,
- Cooperation,
- Self-directed learning,
- Personal mastery.

Why is Learner-Centeredness Popular?

1. Better Researched
(each principle has extensive backing)
2. Many Personal Stories that It Works
3. More Understandable than Other Terms
4. More Integrative and Cohesive
5. More Agreeable and Less Political
6. Implementable in Degrees
7. Tests/Assessments Changing
8. Block Scheduling
9. Numerous Strategies Available
10. Can Teach Content and Thinking!!!

Big Picture Revisited

a. What can teachers do to "assist" in student learning?

Ten Techniques To Assist In Learning: (Bonk & Kim, in press; Tharp, 1993)

1. Modeling (illustrating and verbalizing invisible performance standards);
2. Directly Instructing (provide clarity, needed content, and missing information);
3. Coaching (observe and supervise in guiding toward expert performance);
4. Scaffolding and Fading (supporting what learner can't do and later removing support);
5. Cognitive Task Structuring (explaining/organizing the task within zones of development);
6. Questioning (requesting a verbal response using a mental function learner can't yet do);
7. Articulating and Dialoguing (encouraging description/summary of reasoning processes);
8. Reflecting (fostering self-reflection and analyses of previous performances);
9. Exploring (pushing student discovery and application of problem solving skills);
10. Managing & Feedback (giving performance feedback and positive reinforcement).

b. What resources exist for a lrng environment? (Bonk, Hay, & Fischler, 1996).

Answer is eight different things:

- (1) Teachers,
- (2) Peers,
- (3) Curriculum/Textbooks,
- (4) Technology/Tools,
- (5) Experts/Community,
- (6) Assessment/Testing,
- (7) Self Reflection,
- (8) Parents.

c. Matrix of Active Learning Resources

Directions: Fill in the matrix grid by look at the intersection of resources and teaching techniques and place a plus ("+") to indicate whether it is possible, a negative ("-") to indicate it may not be possible, and a questionmark ("?") when you are uncertain if it is possible.

	1. Tchrs	2. Peers	3. Texts	4. Tech. Tools	5. Experts	6. Assess	7. Self	8. Parents
1. Model								
2. Directly Instruct								
3. Coach								
4. Scaffold & Fade								
5. Cogn. Task Structure								
6. Question								
7. Articulate & Dialogue								
8. Reflect								
9. Push to Explore								
10. Manage and Feedback								

**Twelve forms of electronic learning mentoring and assistance
(Bonk & Kim, 1998; Bonk et al., 2001)**

1. **Social (and cognitive) Acknowledgement:** "Hello...," "I agree with everything said so far...," "Wow, what a case," "This case certainly has provoked a lot of discussion...," "Glad you could join us..."
2. **Questioning:** "What is the name of this concept...?," "Another reason for this might be...?," "An example of this is...," "In contrast to this might be...," "What else might be important here...?," "Who can tell me...?," "How might the teacher..?," "What is the real problem here...?," "How is this related to...?," "Can you justify this?"
3. **Direct Instruction:** "I think in class we mentioned that...," Chapter 'X' talks about...," "Remember back to the first week of the semester when we went over 'X' which indicated that..."
4. **Modeling/Examples:** "I think I solved this sort of problem once when I...," "Remember that video we saw on 'X' wherein 'Y' decided to...," "Doesn't 'X' give insight into this problem in case 'Z' when he/she said..."
5. **Feedback/Praise:** "Wow, I'm impressed...," "That shows real insight into...," "Are you sure you have considered...," "Thanks for responding to 'X'...," "I have yet to see you or anyone mention..."
6. **Cognitive Task Structuring:** "You know, the task asks you to do...," "Ok, as was required, you should now summarize the peer responses that you have received...," "How might the textbook authors have solved this case."
7. **Cognitive Elaborations/Explanations:** "Provide more information here that explains your rationale," "Please clarify what you mean by...," "I'm just not sure what you mean by...," "Please evaluate this solution a little more carefully."
8. **Push to Explore:** "You might want to write to Dr. 'XYZ' for...," "You might want to do an ERIC search on this topic...," "Perhaps there is a URL on the Web that addresses this topic..."
9. **Fostering Reflection/Self Awareness:** "Restate again what the teacher did here," "How have you seen this before?," "When you took over this class, what was the first thing you did?," "Describe how your teaching philosophy will vary from this...," "How might an expert teacher handle this situation?"
10. **Encouraging Articulation/Dialogue Prompting:** "What was the problem solving process the teacher faced here?," "Does anyone have a counterpoint or alternative to this situation?," "Can someone give me three good reasons why...," "It still seems like something is missing here, I just can't put my finger on it."
11. **General Advice/Scaffolding/Suggestions:** "If I were in her shoes, I would...," "Perhaps I would think twice about putting these kids...," "I know that I would first...," "How totally ridiculous this all is; certainly the teacher should be able to provide some..."
12. **Management (via private e-mail or discussion):** "Don't just criticize....please be sincere when you respond to your peers," "If you had put your case in on time, you would have gotten more feedback." "If you do this again, we will have to take away your privileges."

Active Learning Assessments (sample questions):

A. Reflection #1: A New Teacher Self-Assessment for active learning. (Bonk, 1995: *The Social Constructivism and Active Learning Environments (SCALE) Scale*)

Rate: Never = 1; Seldom = 2; Sometimes = 3; Often = 4; Very Often = 5.

In my classes...(sample questions)

- 1. students have a say in class activities and tests.
- 2. I help students to explore, build, and connect their ideas.
- 3. students share their ideas and views with each other and me.
- 4. students can relate new terms and concepts to events in their lives
- 5. students work in small groups or teams when solving problems.
- 6. students use computers to help them organize and try out their ideas.
- 7. I give hints and clues for solving problems but do not give away the answers.
- 8. I relate new information or problems to what students have already learned.
- 9. students prepare answers with a partner or team b/4 sharing ideas with the class.
- 10. I ask questions that have more than one answer.
- 11. students take sides and debate issues and viewpoints.
- 12. students develop ideas from a variety of library and electronic resources.
- 13. students bring in information that extends across subject areas or links topics.
- 14. students suggest possible problems and tasks.
- 15. I provide diagrams or pictures of main ideas to make confusing info clearer.

B. Reflection #2: A Dept. Thoughtfulness Report Card: In this dept. (or class):

- 1. There is sustained examination of few topics, rather than superficial coverage of many.
- 2. The lessons display substantive coherence.
- 3. Students are given an appropriate amount of time to think.
- 4. Teachers carefully consider explanations and reasons for conclusions.
- 5. Teachers ask challenging questions and structure challenging tasks.
- 6. Teachers press students to justify or clarify assertions and answers.
- 7. Teachers try to get students to generate original ideas, explanations, and solutions.
- 8. Teachers are a model for thoughtfulness.
- 9. Students assume the roles of questioners and critics.
- 10. Students offer explanations and reasons for their conclusions.

C. Reflection #3: Student Thinking Report Card (Excerpts from Teacher Assessment of Student Thinking from John Barrell, 1991, Teaching for Thoughtfulness, Longman Publishing).

Rating Scale:

1 = completely false (F); 2 = mostly F; 3 = partly F/T; 4 = mostly True; 5 = completely True

- 1. The student is very interested in ideas.
- 2. The student works well in discussion groups.
- 3. The student can express ideas clearly.
- 4. The student cannot tell which ideas are more important.
- 5. The student can often combine many ideas into one idea.
- 6. The student runs out of ideas quickly.
- 7. The student can often suggest ideas not mentioned before.
- 8. The students thinking is not well organized.
- 9. The student is a lazy thinker.
- 10. The student asks good questions.
- 11. The student likes to try difficult problems.
- 12. The student cannot concentrate for too long.
- 13. The plans the student makes are well thought out.
- 14. The student has trouble making decisions.
- 15. The student can think well about a wide range of things.

(The items below are based on learning preferences. In my classes, I prefer it when...)

Factor 1. Clarification, Elaboration, and Explanation: extent to which students are provided with explanations, examples, and multiple ways of understanding a problem or difficult material.

1. teachers attempt to explain things in another way when someone is confused.
2. students and teachers explain how they got their answers.
3. students can ask teachers for more information about anything unclear or confusing.
4. teachers explain difficult material in more than one way so I understand it better.
5. teachers provide a diagram or picture of main ideas to make confusing information clearer.

Factor 2. Student Autonomy/Centeredness: extent to which learning and thinking decisions are placed in the students' hands (i.e., the degree of student meaningful and deliberate control over learning activities).

6. students have a say in class activities and tests.
7. students are encouraged to come up with ideas about what we should do next.
8. students take responsibility for classroom activities.
9. my classmates and I suggest possible problems and tasks.
10. my classmates and I help make decisions about what we learn.

Factor 3. Teacher Scaffolding/Guidance extent to which the teacher demonstrates problem steps or structure and provides hints, prompts, and cues for successful completion.

11. teachers provide information and suggestions in ways that help me do the work on my own.
12. teachers show us possible next steps after giving us a chance to solve a problem.
13. teachers give hints and clues for solving problems but do not give away the answers.
14. teachers present just enough information to help me succeed.
15. teachers give feedback and guidance that helps me while I'm solving a problem.

Factor 4. Student Prior Knowledge/Meaningfulness: extent to which learning activities are personally relevant and related to the students' prior learning and practical experiences.

16. learning activities are not related to what I've learned in the past.
17. I can relate new terms and concepts to events and experiences in my life.
18. teachers relate new information or problems to what I've already learned.
19. I use what I've already learned to understand new information.
20. I use ideas and information I already know to understand something new.

Factor 5. Generate Connections: extent to which students build their own knowledge connections and generate learning products (i.e., forge their own learning links and experience learning as a personally problematic experience).

21. teachers help me to explore, build, and connect my ideas.
22. I explore how information I'm learning relates and links to other topics and subjects.
23. I memorize facts instead of connecting them to what I know.
24. I bring in information that extends across and links topics we are studying.
25. I make something for teachers that shows or summarizes new topics I have investigated.

Factor 6. Questioning/Discussing: extent classroom conjecture, discussion, and question-asking behavior is encouraged.

26. we discuss correct and incorrect solutions to a problem.
27. teachers encourage me to question and discuss answers given in the book.
28. teachers discourage me from asking questions in class.
29. I am allowed to question whether answers are good or bad.
30. teachers ask questions that have more than one answer.

Factor 7. Media and Resource-Based Exploration: extent to which technological tools and other academic resources facilitate idea generation and knowledge building.

31. I create, design, and try out new ideas by using technology.
32. I use computers to help me organize and try out my ideas.
33. I use the computer to explore original ideas and possible answers to problems.
34. I find new information about topics and subject areas using electronic tools.
35. I develop ideas from a variety of library and electronic resources.

Factor 8. Collaboration and Negotiation: extent to which students socially interact to derive meaning and build consensus.

36. I share my ideas, answers, and views with teachers and students.
37. my classmates and I work in small groups or teams when solving problems.
38. students prepare answers with a partner or team before sharing ideas with the class.
39. I learn what other students think about a problem and to try and see their viewpoints.
40. students take sides and debate issues and viewpoints.

page 78 (Bonk, 1995)

Social Constructivism and Learning Communities Online (SCALCO) Scale
(Bonk & Wisner, 2000)

Part A. Social Constructivism and Learning Communities Online Questionnaire
Questions (1 = strongly agree; 5 = strongly disagree)

1. The topics discussed online had real world relevance.
2. The online dialogue dealt with original topics.
3. As the forum progressed, I developed a position on various topics that I did not have before the online forum.
4. The online forum dialogue offered multiple perspectives.
5. The online dialogue encouraged me to reflect on the issues.
6. I integrated new knowledge acquired from the online discussion into my existing knowledge, which resulted in a deeper understanding of the issues.
7. I made new connections to the course material as a result of the online environment.
8. I have more ideas that I can use about this topic than without the online forum.
9. The online forum nurtured my critical thinking and evaluation skills.
10. I had a voice within the discussion forum.
11. I had some personal control over course activities and discussion.
12. Online discussions were not relevant to my learning needs.
13. The online technology allowed me to design and create new ideas.
14. The online environment encouraged me to question ideas and perspectives.
15. I liked collaborating with others online.
16. Instructors provided useful advice and guidance online.
17. I could count on others to reply to my needs.
18. The online environment fosters an atmosphere where more than one answer may be correct.
19. I collaborated with other participants in the forum that resulted in new perspectives and a better understanding.
20. I felt that I was a member of the group.
21. The other group participants acknowledged my contribution to the discussion.
22. I felt committed with other online participants to work together in order to acquire a deeper understanding of the issues.
23. I felt the discussion took the issues to a deeper level.
24. The online forum provided opportunities for in-depth discussion.
25. I clarified my ideas by sharing them with others online.
26. I clarified my ideas by reading other participants' comments.
27. I gained an appreciation for other opinions and perspectives.
28. I received useful mentoring and feedback from others.
29. The online environment fostered peer interaction and dialogue about real-life problems.
30. The online discussions lowered the isolation and loneliness of similar learning situations.
31. The online forum fostered a sense of a collaborative learning community.
32. There was a sense of membership in a learning here.
33. Other participants and I make decisions about how we will proceed or learn online.
34. Instructors or moderators provide just enough resources to help me succeed online.
35. This environment had opportunities to prepare answers with peers or learning teams.
36. Peer evaluation and feedback was integrated into this learning environment.
37. The online environment allowed for the exploration of topics of personal interest.
38. I could share and discuss my ideas and answers with others in this environment.
39. It was interesting to see how differences of opinion were discussed and negotiated in this environment.
40. Summaries or compromise positions were facilitated in this environment.

**Online Teaching Competencies Scale, From: The Online Teacher
April, 2001, Guy Kemshal-Bell
TAFE (Technical and Further Education), Australia.**

Please rate each of the identified online teaching skills below as either:

- (3) critical**
- (2) very important**
- (1) useful**
- (0) not required**

- 1. An ability to use email effectively.**
- 2. Skill in using online forums or bulletin boards.**
- 3. Skills in using an online chat facility.**
- 4. An ability to develop simple Web pages.**
- 5. Higher-level Web page development skills (e.g., JavaScript, ASP, Flash).**
- 6. An ability to use video and/or audio conferencing.**
- 7. An ability to engage the learner in the online learning process.**
- 8. Skills in online "listening."**
- 9. An ability to provide effective feedback online.**
- 10. Skills in effective online questioning.**
- 11. An ability to provide direction and support to online learners.**
- 12. An ability to effectively manage online discussions, either chat or forums.**
- 13. An ability to build online teams.**
- 14. A capacity to build relationships with your online learners and between your online learners.**
- 15. An ability to motivate online learners.**
- 16. Having a positive attitude to online teaching.**
- 17. Being prepared to be innovative and or experimental.**
- 18. Skills in time management.**
- 19. An ability to establish and maintain guidelines for the learning process.**
- 20. Skills in planning, monitoring, and reviewing training.**
- 21. Skills in being able to adapt courses and teaching to meet the individual needs of the learners.**

1-7 = Technical Skills

8-17 = Facilitation Skills

18-21 = Management Skills

(BONK et al 2001)

Table 1. Summary of the pedagogical, social, managerial, and technological roles of the online instructor

	General Components and Questions (Ashton et al., 1999; Mason, 1991)	Ideas from Situations #1-4
1. Pedagogical Role	<p>Components: Assume role of facilitator or moderator (e.g., ask questions, probe responses, encourage student knowledge building and linking, summarize or weave discussion, help identify unifying themes, and support and direct interactive discussion, design a variety of educational experiences, provide feedback, offer constructive criticism and rationale, provide explanations and elaborations, utilize direct instructions when appropriate, elicit comments and reflection, referring to outside resources and experts in the field.)</p> <p>Questions: Who is responsible for different learning activities? Is there much debating and reflection? What activities might foster greater interaction?</p>	<p>Ideas: Create problem or project-based learning environments, foster peer interaction and feedback, encourage perspective taking and online peer feedback, try innovative techniques (starter-wrapper, debates, online field reflection, electronic cases, structured controversy, team activities), post favorite Web links, monitor and encourage activities with rich peer interaction and feedback, and ask many probing questions.</p>
2. Social Role	<p>Components: Create a friendly and nurturing environment or community feel, exhibit a generally positive tone, foster some humor, display instructor empathy and interpersonal outreach (e.g., include welcoming statements, invitations, and apologies), and personalize with discussion of one's own online experiences.</p> <p>Questions: What is the general tone of the course? Is there a human side to this course? Is joking allowed?</p>	<p>Ideas: Employ online cafés as well as student profiles pages, digitize class picture, support casual conversation (e.g., discuss survival tactics, online concerns, instructor anecdotes, etc.), embed jokes and puns when appropriate in responses, and try to create an online community (e.g., share personal stories, invite visitors and foreign guests).</p>
3. Managerial Role	<p>Components: Coordinate assignments (e.g., explain assignments, set plans for receipt of assignments, assign partners and groups, set due dates and extensions for assignments), manage online discussion forums (e.g., set pace, focus, agenda), and handle overall course structuring (e.g., organize meeting times and places, set office hours, clarify grade distributions, explain the relevance of the course, correct</p>	<p>Ideas: Consider initial live meetings or online chats, provide detailed syllabus and clear expectations, post online calendar of events or assignments page, provide online gradebook, FAQs, and summary of administrative matters, monitor ongoing discussions and interrupt when</p>

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	<p>course materials, and discuss potential course revisions).</p> <p>Questions: Do students understand the assignments? Do they understand the course structure? Are they lost or confused anywhere?</p>	<p>off track, assign email pals or constructive friends, provide weekly email feedback, use electronic portfolios to provide overview of how well students are doing, and track user logins.</p>
<p>4. Technological Role</p>	<p>Components: Assist with user technology and system issues, diagnose and clarify problems encountered, notify when a server is down, explain system limitations.</p> <p>Questions: Do students have the basic skills? Does their equipment work? Do necessary passwords work?</p>	<p>Ideas: Find existing courseware systems or create custom tools, train early, have orientation task and early assignments to test system, explain any custom or unusual tools, have students vote on preferred technologies, be flexible when problems are encountered.</p>

Telementoring Taxonomy (Brescia, 2002)

Coaching through participation

Model good analysis: Show the students the kinds of behaviors you are looking for. Provide examples of good posts. For example, one of the attributes of asynchronous conferencing is the ability for conference participants to find references and quote from them online. By linking student ideas to the readings it is possible to model what is expected of the students.

Clarify: Provide keys, links, framing statements, focusing statements, and examples from the readings and other resources that help the discussion avoid vagueness. The discussion should include references to the readings and other research, rather than discussion of what students did on the job last week.

Challenge hypotheses: Students will be developing hypotheses relating to actions to be taken relating to the case studies they are working through. The instructor may introduce some conflict into the proceedings by challenging those hypotheses. For example, bring up a nonprofit management theory that is counter to the one the students are proposing. Another possibility is to challenge the context the students have constructed.

Question: Ask students to think some more about what they are saying or conclusions they have reached. The instructor may ask any number of questions to help the students explore an idea, clarify their thinking, reach a conclusion, or work on an assignment. Ex: Can you give some examples of this? How might you go about doing that?

Asking for Clarification: Similar to questioning but usually more specific. A student might have made a specific assertion that the class or the instructor is unclear about the meaning or theme. This is a simple request to make the post more clear, hopefully by providing more supporting references.

Providing structure

Frame tasks: The instructor must provide structure in order for the discussion to proceed toward a reasonable end. The instructor should devise clear tasks and allow appropriate time for discussion and completion of those tasks. Once the task is clear, the faculty mentor should help the students stay on task.

Summarize: The faculty mentor guides the discussion along by summarizing key points, topics covered and those still needing to be covered, and bringing the group to a point of convergence from which they can move forward. The faculty mentor should not always be the summarizer. The responsibility for this might pass to the "student(s) of the week".

Encourage reflection: Students should think about what should be done as much as how to do it. Help the students to reflect on what they have said in the discussion and how it may contribute to an outcome. By stating your opinion, students can compare their own thinking to your more expert thinking. Ex: What were you thinking about when you were doing that? Did your actions change after doing that several times? Did you ever stop to question your assumptions?

Stating Opinions: Students sometimes need the instructor to state an opinion on a subject to bring closure to a portion of the discussion or to address an issue that has caused dissension within the group and needs to be resolved. Of all the portions of the taxonomy, this type of post should be resisted as students may come to rely upon it as the right answer as opposed to an aid in thinking deeply about issues.

Supporting individual students

Nourish good ideas: The faculty mentor markets the good points a student has made to the group or may intervene in a conflict to defend points a student has presented. The mentor is trying to convince the class of the significance of particular ideas and is attempting to gain admission of those ideas into the conversation. By showing appreciation of student ideas the faculty mentor gives support to those thoughts.

Champion lost ideas: The instructor can help a student's ideas have visibility in the discussion by returning the discussion to ideas a student has presented but were not followed up on by the conference. This provides support for a student's ideas as expressed in the conference.

Feedback: The faculty mentor provides simple positive or negative feedback. The mentor is attempting to support or correct specific student behaviors. These posts provide encouragement and supportive feedback to the student. Ex: 'Good post. I particularly like how you brought in the reading for the week'.

Recommending Resources: In Face-to-Face mentoring situations instructors often provide single students or the entire class with specific references to additional resources that are recommended for further, but not required, reading in the area being discussed.

MOTIVATIONAL

THEORY

AND

TECHNIQUES

Motivation Research Highlights (Brophy)

1. Supportive, appropriate challenge, meaningful, moderation/optimal.
2. Teach goal setting and self-reinforcement.
3. Offer rewards for good/improved performance.
4. Novelty, variety, choice, adaptable to interests.
5. Gamelike, fun, fantasy, curiosity, suspense, active.
6. Higher levels, divergence, dissonance, interact with peers.
7. Allow to create finished products.
8. Provide immediate feedback, advance organizers.
9. Show intensity, enthusiasm, interest, minimize anxiety.
10. Make content personal, concrete, familiar.

Other Classroom Motivation Tips (Alexander, class notes, Pintrinch & Schunk, 1996; Reeve, 1996; Stipek, 1998):

1. Include positive before negative comments.
2. Wish students “good effort” not “good luck”.
3. Give flexibility in assignments and due dates.
4. Communicate respect via tasks select and control.
5. Design interactive and interesting activities.
6. Use coop learning, debates, group discussions.
7. Minimize social comparisons and public evaluations.
8. Use relevant, authentic learning tasks.
9. Use optimal difficulty and novelty.
10. Use challenge, curiosity, control, and fantasy.
11. Give challenging but achievable tasks.
12. Create short term or proximal goals and vary these goals.
13. Give students different ways to demo what they know.
14. Encourage students to give and get help.
15. Attrib failure to low effort or ineffective strategy.
(Attrib success to effort or competence)
16. Give poor performing student the role of expert.

150 Ways to Motivate in the Classroom (Raffini, 1996)

1. Ice Breakers

(Treasured objects, birthday circles, treasure hunts, middle name game, accomplishment hunts, similarity wheels, who's like me, coat of arms, self-disclosure intros, expectations charts, scrambled sayings)

2. Goal Cards, Goal Notebooks

(ST and LT with objectives and ideas how to achieve)

3. Floating A, Escape Clauses, Volunteer Assignments, etc.

(to be used on any assignment within 25 hours)

4. Self Report Cards, Self Evaluation

5. Discussion Questions, Issues, Problems, Solutions

(Perhaps answer questions of the other teams, talking chips)

6. Term Crossword Puzzles or Term Matching, Competitions, Dilemmas

7. Success Contracts and Choice Calenders

(Guarantee an A or B if fulfill contract provisions)

8. Positive Statements, Self Reinforcements

(Bury the "I can'ts" and Save the "I Cans")

9. Celebrations, Praises, Acknowledgments, Thank Yous, Put-Ups

(Multicultural days, trips, class awards, helpers, end of term)

10. Class Community Building

(Web Site and Digitized Web class photo, photo album, class project, teeshirts, field trips)

11. Democratic Voting, Student Interest Surveys, Class Opinion Polls

12. Random Acts of Kindness, Service Learning/Teaching, Volunteerism

13. Change Roles or Status

(Random roles, assume expert roles, switch roles for a day)

1001 Ways to Energize Employees (Bob Nelson, 1996)

1. Bank of Boston--4 informational days to work on special projects.
2. Honda--places individuals who know nothing about tech in design teams.
3. Hewlett-Packard--takes out of routine by putting new bus plans on trial.
4. Delta Land Survey--employees vote once/year on dress code, bonuses, etc.
5. Tandem Computers--promotions based on technical OR managerial merit.
6. Scitor Corp--no max number of sick days (ave. is 5 days/year--low).
7. Adobe Systems--set own hours & eligible for stock options & sabbaticals.
8. Matsushita--created research lab of 20 scientists free to explore any proj.
9. Dan Corp.--employees can spend \$500/project to improve efficiencies.
10. Worthington Industries--majority of employees must approve new hires.
11. Xerox--share ideas no matter rank, time clocks out & teams are in (trust).
12. Hi-Tech Hose--lumps all vacation, sick, & holidays in a single account.
13. Pitney-Bowes--consider displaced persons b4 turning to outside market.
14. Ventura--pushes to take time off outdoors as long as work is done.
15. Lands' End--encourages to express interest in any dept interested in.
16. Microsoft--encourages fun/playfulness (e.g., installing sod, sprinklers, lawn mowers in an office).
17. Walmart--managers wear jeans once/week to help line workers/staff.
18. Duke Power Co.--can post electronic message to change/swap jobs.
19. Saturn--employees can send anonymous messages to upper management.
20. Whole Foods--everyone can access sales, profit margins, & salaries.
21. Diesel Tech Corp--disabled products so employees can see how fit.
22. FedEx--internal newsletter with columns devoted to competitor info.
23. Levi Strauss--employees rate each other on teamwork, trust, communication.
24. Computer Specialists--clients rate workers & employees rate own perf.
25. Queen Mary Resort--brainstorms & votes once/month how to imp jobs.
26. Advanced Micro Devices--managers have quarterly breakfast with boss.
27. Motorola--has quarterly employee town meetings with rap sessions.
28. S.C. Johnson Wax--flew all employees of foreign buy-outs to the U.S.
29. Com-Corp--installed "screwup boxes" to tell manage what doing wrong.
30. Wired Magazine--two "living room" mtg areas--sofas, stereos, CDs, etc.
31. Microsoft--play basketball, frisbee, golf, etc. and be casual at work.
32. Sun Micro--designed forum spaces & sun rooms for spontaneous conversations.
33. Lands End--\$9 mil for activ ctr--pool, track, photo, gym, tennis, picnic tables, whirlpool, etc.
34. Southwest Air--1/4 of profit sharing funds must go to company stock.
35. Computer Media Tech--encour volunteer in soup kitchens, elderly homes, etc.
36. Xerox--social service leave program (1 month to a year) with pay.
37. Ben Jerry's Homemade--set aside 1% of profits for peace programs.
38. Salem Sportswear--anyone with a tie beyond a certain pt is fined \$2.
39. Owens-Corning Fiberglass--open space mtg rms, no agenda, no plans.
40. Nissan--uses Involvement Through Teamwork (ITT) to discuss probs.
41. Siemens Info Sys--created team of 23 young, talented employees under 40 to advise management.
42. Hewlett-Packard--has 24 hour labs for res'ers & encourage to spend 10% on personal projects.
43. AT&T--project team weekly outings to play darts & shoot pool.
44. United Airlines--allowed workers to swap assignments (reduced sick time).
45. Odetics--wacky stuff; telephone booth stuffing contests, bubble gum blowing, '50s day, yoga.
46. Hallmark Greeting Cards--creativity ctr with clay, paint, etc. to think up ideas.
47. Chiat Day (ad agency)--hangs punching bags of execs in break rooms.
48. Alagaso--Pres Mike Warren distrib "Hey Mike" cards & posters in firm.
49. Cooper Tires--for ownership, operators can **stamp names inside tires produced.**
50. Southwest Air--CEO kissed an employee who turned down a job offer (both males).

Merger of Ice Breakers (Bonk, 1998; Raffini, 1996; Scannell & Newstrom, 1991; Thiagarajan, 1998)

1. Ice Breakers

a. Round I: Self-disclosure introductions (who are you, job, interests, hobbies)

2. Round II. Self-disclosure introductions...

a. Treasured Objects--Take out two items out of your wallet and describe how they best represent you (e.g., family pictures, credit cards, rabbits' feet) and share.

b. Describe themselves (e.g., "I am a tightwad," "I am superstitious")

c. State name with an adjective starting with 1st letter of 1st name.

(e.g., Marvelous Mary, Dancing Diane, Inscrutable Ida, Crusty Curt)

d. Now intro self & also by a nickname current, past, or potential nickname.

(ask others what it means during break)

e. Brainstorm a list of questions you would like to ask the others...

(e.g., My person I most admire is? The best book I ever read?)

F. Middle name game (state what middle name is and how you got it).

3. Expectations charts

What do you expect from this workshop, what are your goals, what could you contribute?

a. Write short and long terms goals down on goal cards that can be referenced later on.

b. Write 4-5 expectations for this workshop/retreat

c. Expectations Flip Chart: share of 1-2 of these...

4. Treasure hunts--fill out card with interests, where born, would like to live, strengths, job role, hobbies, etc. and find a match (find one thing in common and one thing different with everyone)

Pass out an Index Card: What is unique about you???

a. Favorite Sports/hobbies/past times (upper left)

b. Birthplace and Favorite cities to visit (upper right)

c. Current Job and Responsibilities (lower left)

d. 2 comments, things, or traits about yourself (e.g., team player, personable, talkative, opinionated, hate Purdue, like movies, move a lot, hate sports) (lower right)

e. Accomplishments you are proud of (in the middle)

5. Accomplishment Hunt

a. Turn in 2-3 accomplishments (e.g., past summer, during college, during life);

b. Workshop leader lists 1-2 of those for each student on a sheet without names.

c. Participants have to ask "Is this you?" If yes, get a signature.

6. Issues and Discussion Questions

a. make a list of issues people would like to discuss.

b. Perhaps everyone brings 2-3 questions or issues to the meeting.

c. Partner off and create a list and then collect question cards, and,

d. then distribute and your group must answer questions of the other groups.

7. Team brainteasers (IQ tests), scrambled cities, crossword puzzles, competitions, dilemmas, or unscrambled sayings.

8. Coat of Arms--fill in.

#1: a recent Peak Performance;

#2: something very few people know;

#3: draw a symbol of how you spend your free time;

#4: fill in something you are really good at;

#5: write in something that epitomizes your personal motto.

9. It'll Never Fly Wilbur

- a. Introduce a new idea or concept or plan.
- b. Everyone writes 4-5 problems they see in it.
- c. Divide into groups of 3-4 and discuss concerns.
- d. Each group writes down 3 roadblocks on a 3 X 5 card.
- e. Facilitator redistributes so each group gets a different card.
- f. Subgroups think creatively of how to solve those problems and share with group.

10. Birthday groupings--Nonverbally up by date of year born and partner off with person closest to you in b-day and then do...

11. Talking String--state what hope to gain from retreat (or discuss some other issue) as wrap string around finger; next ones state names of previous people and then state their reasons.

12. Divide into small groups of about six people and then hand out prepared list of 5 questions in increasing order of disclosure for participants to ask each other and then have someone stand and their group must describe him or her.

13. Psychic Massage (a closer activity)

- a. Divide in teams of 3-5.
- b. In alphabetical order of first names have someone turn his or back to the group
- c. Team members must make positive, uplifting statements about that person behind his or her back but loud enough for others to hear them.
- d. One minute per person.

14. Positive Strokes

- a. 2-3 times during the session, each person fills out a 3 x 5 card about other participants.
- b. They must complete sentences like: "the thing I like best about (name) is" and "the biggest improvement I saw in (name) is".
- c. At the end of the day, the folded cards are passed out and read aloud and then given to the named person.

15. Community Building--common teeshirts, photo of group and perhaps put up on the Web. Put announcement of retreat on Web or newsletter.

16. Communication/Learning Visuals--Draw one or more of the following that you want to use during the training: Gun, cannon, noose, high fives, thumbs up, watch, toilet, smiley face, etc.

17. Ask how feel, what has happened, what did they learn, how might this help in workplace, ask "what if" things were different at work, and what's next???--how might they do things differently?

18. Have you ever questions:

1. Been in a parade, performed the Heimlich maneuver, walked on stilts, surfed, drank more than 10 cups of coffee in a 24 hour period, owned a watch for more than 10 years, tried on a straight jacket, been to a morgue, laid down inside a casket, ridden in a Rolls Royce, swum a mile in an ocean, drunk more than 25 imported beers during your life, owned a Rolex watch, been a Boy Scout or Girl Scout, shaved your head, flown in an ultra-light, flown a plane, ditched a blind date, owned a car that cost more than \$35,000, water skied on one ski, sky dived, bungee jumped, whitewater rafted a dangerous river, been in a play, milked a goat or a cow, done back-to-back all-nighters, completed a marathon, broken a bone, made an obscene gesture at someone when driving your car, cheated on your income tax, had a permanent tattoo, run a toll booth, had a hot cup of coffee spill on your lap, been in the CN Tower in Toronto, been above the Arctic circle or below the Antarctic Circle, been in a coed nude sauna or hot tub.

What Are Some Motivational Strategies? An Annotated List of More Than 200 Possibilities— An Idea Bank

What causes you to read this chapter? What makes the “punk-rocks” cut their hair “weird” and dye it with psychedelic colors? What made you “tick” when you were going to junior and senior high school? What forces drive our behavior, what motivates us to behave in a particular way? When we ask questions such as these, we are talking about *drives, incentives, needs, motivations, and aspirations*. We shall refer to this as DINMA.

The word *motive* is derived from the Latin *motivus* , meaning moving or impulse, and the psychologist's study of DINMA is analogous to the physicist's study of the phenomenon of motion: What starts the movement, what keeps it going, what stops it, and what decides the direction of the motion?

In this chapter, our intent is to identify salient features of DINMA as they relate to today's secondary school students and to suggest possible applications for secondary school teaching. As teachers, we must be cognizant of the significance of motivation:

- Motivation is a concept of major importance in American society.
- DINMA plays a major role in the success of a student's learning.
- Motivation in the secondary school sets the initial tone for career choices.

The teenagers of today are used to multimillion-dollar productions on television and the movie screen, but when they come into a classroom and are subjected each day to something short of a high-budget production, it is no wonder that they sometimes react in a less than highly motivated fashion. There is no doubt that our youth are growing up in a highly stimulated instant-action society, a society that has learned to expect instant headache relief, instant turn-on television sets, instant dinners, and perhaps even instant high-payment employment. In light of this we are on the side of you, the teacher, who is on the firing line each day, and who is expected to perform,

perhaps instantly and entertainingly, but most certainly in a highly competent and professional manner, and in situations not even close to ideal. But in any case,

YOU MUST GAIN YOUR STUDENTS' ATTENTION BEFORE YOU CAN TEACH!

In this chapter we provide a long list of potential motivators, first those general to all fields, then those more specific to particular subjects. We suggest that you read all of the entries for each field, for although one entry might be identified as specific to one field, it may also be useful in other areas, or it might stimulate a creative idea for your own stock of motivational techniques.

A. GENERAL IDEAS FOR MOTIVATION

1. Your students should clearly understand the objectives of your class activities and assignments.
2. Show enthusiasm and interest in what you have planned and are doing.
3. Present the proper quantity of content at the proper pace.
4. Vary the teaching procedures and the activities. Let students follow the activities of their choice with responsibility for change.
5. Use familiar examples in presenting your materials. Don't just teach definitions, principles, theorems, or rules. Be certain to explicate these with concrete examples that can be understood by students.
6. Use audiovisual materials—but do not assume that the materials have "built-in motivation." Select those that would be relevant and interesting to the students on the topic or subject matter that is under consideration.
7. Use objects for the lesson—foreign stamps, coins, models, antiques, toys, and so on.
8. Plan your orientation set induction (what you do the first few minutes of a class period) with care.
9. Keep students informed of their progress. Don't keep them in the dark as to where they stand.
10. Remember that students need to be recognized by you, by their parents, and by their peers.
11. Remember that students need steady awareness of progress being made, of "How am I doing?", "What can I do better next time?"
12. Talk with individual students about their problems and their interests.
13. Go down your roll book periodically and ask yourself what you know about each individual in the class.
14. Students are sometimes motivated by extrinsic devices such as tests. Use this technique judiciously, not as a weapon for punishment.
15. Give praise or rewards for jobs well done. But in groups, use strong praise sparingly.
16. Utilize a modified version of the elementary show-and-tell activity.
17. Have the students make a movie or slide show of class activities (e.g., a role-playing lesson). Let them plan and write the narration.

18. Word naming in various categories—such as synonyms, same initial letters, various uses of a term—becomes an indicator of ideational fluency.
19. Invite guest speakers when and where appropriate. Perhaps some of the parents can be resource persons. (See also number 22)
20. Hold small-group discussions in class. These often are more beneficial than are large-group or all-class discussions.
21. Utilize Mondays or days following holidays to share with your class an exciting or enjoyable experience.
22. Have students prepare a potential guest speaker resource file.
23. Try playing music in your classroom for mood setting, to relieve anxieties and tensions.
24. Use educational games in your teaching. (Refer to Chapter 11 for sources.)
25. Try role-playing to enhance the reality of material being learned.
26. Try unit contract or contract teaching.
27. Write individual and personalized notes to students on their papers, rather than merely letter grades or point scores.
28. Try videotaping an activity and replaying to the entire class.
29. Invent a useful educational game with class help.
30. Have students plan with you the "open house" and/or "back-to-school-night" activities. This helps in getting parents out, too.
31. Let the class help plan a field trip.
32. Have the students create and design a simulation game for a specific subject area or controversial issue in your field.
33. Create student mailboxes out of ice-cream cartons for distribution of papers. Be sure to have one for yourself. Everyone likes to receive mail. You may wish to limit mail delivery time to the first few minutes of the class period.
34. Recycle old textbooks by removing all text material but leaving pictures and diagrams; then have students create their own texts.
35. Obtain permission from the administration to redecorate your classroom with colorful walls, drapes, and stuffed furniture.
36. Use a mandala to demonstrate the importance of individual experiences, as in interpreting novels (for English), or current events (social studies), or paintings (art).
37. Have students list items related to the subject content, but write with their nondominant hand, as an introduction to brainstorming.
38. Every Friday, provide a "coupon bag" from which students who have behaved and performed well during the week may draw blindly one from a variety of coupons, such as "one free assignment," "5 points extra credit," "teacher's assistant for the day," "one free ice cream cone," "sit where you want for one day."

B. EXPRESSING ENCOURAGEMENT AS A MOTIVATOR

Parents and teachers often express words of encouragement as a motivator. Words and expressions have many different shades and connotations, and therefore it would be very useful for teachers to know what kind of messages the student is

receiving: Does the expression truly convey acceptance, trust, confidence, and praise, or does it imply impatience, disappointment, and preaching? Consider the expressions that follow:

39. *"You have improved in . . ."* Improvement may not be where we would like it to be, but if there is progress, there is better chance for success. Students will usually continue to try if they can see some improvement.
40. *"You do a good job of . . ."* Point out some useful act or contribution in each student. Even a comment about something small and insignificant to the teacher may have great importance to a student.
41. *"We like (enjoy) you, but, we don't like what you do."* The student should never think he or she is not liked. It is important to distinguish between the student and the student's behavior, between the act and the actor.
42. *"You can help me (us, the others, etc.) by . . ."* To feel useful and helpful is important to everyone. Students want to be helpful; we have only to give them the opportunity.
43. *"Let's try it together."* Students who think they have to do things perfectly are often afraid to attempt something new for fear of making a mistake or failing.
44. *"You would like us to think you can't do it, but we think you can."* The student says or conveys that something is too difficult for him or her, and hesitates to even try it. If he or she tries and fails, the student has at least had the courage to try.
45. *"I'm sure you can straighten this out [solve this problem] but if you need any help, you know where to find me."* Adults need to express confidence that students are able to and will resolve their own conflicts, if given a chance.
46. *"I can understand how you feel [not sympathy, but empathy] but I'm sure you'll be able to handle it."* Sympathizing with another person seldom helps that person, but understanding the situation and believing in the person's ability to adjust to it is of much greater motivation to the student.

C. MOTIVATIONAL IDEAS SPECIFIC TO SUBJECT AREAS

Art

47. Use lyrics from popular music to influence class work, such as by putting the lyrics into pictures.
48. Bring in examples of the instructor's work, both current and beginning. This would enable students to relate more easily their own beginning frustrations with instructors.
49. Go outside into the schoolyard for free drawing experience. Do a class mural on a piece of quarter-inch plywood.
50. Use a mandala to demonstrate the importance of individual experience, as in interpreting paintings.
51. Arrange a field trip for the class to dig up natural clay. In class, sift and refine, soak in water, and work it into usable clay. Follow with hand-built clay project.

52. As part of a unit on the creative process, have each student draw on a piece of paper, then pass it on to the next person, and that person will make additions to the paper. Instructions could include "improve the drawing," "make the drawing ugly," "add what you think would be necessary to complete the composition."
53. As part of a unit on design or creativity, have students construct, design, and decorate their own kite. When the projects are complete, designate a time to fly them. Make necessary arrangements.
54. Listen to a musical recording and try to illustrate it.
55. Imagine that you're a bird flying over the largest city you have visited. What do you see, hear, smell, feel, taste? Draw a "sensory" map.
56. Assign a different color to each student. Have them arrange themselves into warm and cool colors and explain their decision (why blue is cool, etc.). (Include emotional responses to the color.)
57. Make a class visit to local galleries to observe works of contemporary artists.

Business Education

58. Choose a sentence or paragraph everyone has typed several times already. The instructions are for the students to type until they make an error, whether it be not capitalizing a word, typing a wrong letter, or whatever. The last one typing is the winner.
59. For production work, such as typing letters in a second-semester typing class, you, the teacher, take on the role of the "boss." Therefore, when a letter is typed the "boss" will receive it for signing. In this way the students are not just typing a letter for a grade, but typing it for the "boss," which will mean the letter will be set up according to the boss's instructions.
60. Make a field trip to the front office to observe and talk to the office workers. Those included in the interviews would be the principal's and vice-principal's secretary, the registrar, and attendance clerks. This field trip would interest some students to seek student jobs in the office. In addition, there are other jobs on campus that they can find out about and investigate for possible employment. Back in the classroom, have each student report his or her findings to the rest of the class.
61. Have office (administration) personnel come into class and dictate "real" letters and have students experience office-style dictation.
62. Compose crossword puzzles and newspaper cartoon strips in shorthand.
63. Arrange the students (on a rotational basis) to be "aides" to administration or to free teachers in order to take, transcribe, and type dictation.
64. Flash cards with account titles. Depending on the lesson, students could tell which type of statement the account would be found on, or you could use such cards to reinforce debits and credits. They could be used also as a few-minute drill with the whole class. They are more useful, though, to use as a game between two pupils who need to review. The one who gets most right wins.
65. In typing, on a designated day each week everyone could bring anything they wished to type, e.g., a page from a book, a friendly letter, a magazine article, a term paper, anything they wished.

66. In teaching T-accounts, divide the room into teams, the number on a team depending upon class size. There are four teams usually, so teams will be small. First have one team make up transactions and the other try to answer, then reverse. The team to get the most right out of 20 transactions would win.
67. In typing, by use of letters and following specific directions, students can type pictures.
68. In choosing "practice sets" for accounting, as a teacher try to choose from the sets available several different ones, trying to match student interest.
69. In accounting or shorthand, be specific about amount of work to be done during the week, the work to be collected the following Monday. If the work is all done by Friday at the end of class, there would be no homework over the weekend.
70. Use computer programs, if available, as another activity to stimulate interest.

English (Including ESL, Speech, Drama, Journalism)

71. For a unit such as Elizabethan English, a wall-to-wall mural depicting a village of the times may be a total class project. Students can research customs, costumes, and architecture. Others may paint or draw.
72. For the holidays students can design their own holiday cards, creating their own poems for their cards.
73. To enhance understanding of parts of speech, set up this problem: Provide several boxes containing different parts of speech. Each student is to form one sentence from the fragments chosen from each box, being allowed to discard only at a penalty. The students then nonverbally make trades with other students to make coherent, and perhaps meaningfully amusing sentences. A student may trade a noun for a verb but will have to keep in mind what parts of speech are essential for a sentence. Results may be read aloud as a culmination to this activity.
74. Try this for an exercise in objective versus subjective writing: After a lesson on descriptive writing, bring to the class a nondescript object, such as a potato, and place it before the class. Ask them to write a paragraph either describing the potato in detail, that is, its color, size, markings, and other characteristics, or describing how the potato feels about them.
75. Set up a special communications board somewhere in the room where students may write anonymously or post sealed comments addressed to particular individuals, including the teacher.
76. Read to the class a story without an ending, then ask the students to write their own endings or conclusions.
77. Ask the students to create an advertisement using a propaganda device of their choice.
78. Ask the students to each create and design an invention and then to write a "patent description" for the invention.
79. Establish a "mini-library" in a corner of your room.
80. Ask students to write a physical description of some well-known public figure, such as a movie star, politician, athlete, or musician. Other class members may enjoy trying to identify the "mystery" personality from the written descriptions.

81. A bulletin board may be designated for current events and news in the world of writers. Included may be new books and record releases as well as reviews. News of poets and authors may also be displayed.
82. Start a paperback book library in your classroom. Set aside some time each week for reading. Perhaps one of your students would volunteer to serve as your "librarian."
83. Ask your students to maintain a daily "journal," with emphasis on expressing their feelings and unedited thoughts. Journals should be accepted as personal statements, which are to remain unjudged.
84. Provide students a choice as to which novel they will read next.
85. Design a "game" where students give original names to stories or captions to cartoons.
86. Remove the text from a Sunday newspaper comic strip and have the students create the story line.
87. Use popular recordings to introduce vocabulary words. Use for analysis of antonyms, synonyms, listening, writing, comprehension, and other skill development.
88. Use newspaper want ads to locate jobs as a base for completing job application forms and creating letters of inquiry.
89. Use videotape equipment to record employer-employee role-play situations, interviews for jobs, or child-parent situations, to develop language and listening skills.
90. Have students choose a short story from a text and write it into a play.
91. Use a round robin type of oral exercise to practice different kinds of sentence development.
92. Design an antonym game such as: have one student write a word on the board, then a student who correctly guesses the antonym goes to the board.
93. Have students look in newspapers and magazines for examples of the type of writing being studied in class. Give points for correct examples brought in.
94. When beginning a poetry unit ask students to bring in the words to their favorite songs. Show how these fit into the genre of poetry.
95. Once in a while dress yourself in costume and makeup and role-play the character your class is studying.
96. Have your students look for commercial examples of advertisements that might be classed as "eco-pornographic," i.e., ads that push a product that is potentially damaging to our environment.
97. Change the environment and ask students to write poetry to see if the change in surroundings stimulates or discourages their creativeness. For example, take your class to a large supermarket to write (you are advised to make arrangements first).
98. Bring a television set to class and have your students analyze advertisements for the emotions they appeal to, techniques used, and their integrity. Try the same thing with radio, teen magazines, and other media.
99. Have each student maintain a dream diary from which creative writing develops.
100. Use imagery to stimulate creative writing.
101. Use a mandala to demonstrate the importance of individual experiences, as in interpreting poetry.

Foreign Languages

102. Draw a large outline of the target language country on cardboard and have students fill in the major cities, rivers, and mountains. They can illustrate products of different regions, costumes, and other significant characteristics of the country.
103. Translate the school menu into the target language, perhaps as a daily project of selected groups from within the class.
104. Perhaps your class could earn money and go to a target language restaurant as an end-of-the-year class activity. You could obtain copies of the restaurant menu in advance so that students could select and practice ordering in the target language.
105. Organize a spelling bee in the target language, using the target language alphabet.
106. Play "password" in the target language.
107. Begin a game by saying "I went to (the target country) and took a radio" in the target language. The next student repeats the sentence adding another item, e.g., "I went to (the target country) and took a radio and a raincoat." If a student misses an item he or she is out; this continues until only one student remains.
108. Show the students a tray containing several items they know how to say in the target language. Allow them a few minutes to study it, then remove it and ask them to list all of the items on the tray.
109. Provide puppets in native costume for students to use in practicing dialogue.
110. Invite an exchange student from (the target country) to talk with the class about his or her experiences and culture.
111. Once a month take the class on a "trip" to a city of a country where the target language is spoken, through the use of slides, pictures, realia, native speakers, and music.
112. Establish a pen-pal exchange with a beginning English class in a country where the target language is spoken.
113. Play "fill-in-the-word" game. Each student has a card with one word on it and must find other students with other parts to make a sentence (in the target language).
114. Take your class to a movie spoken in the target language.
115. If you can do it comfortably in the target language, practice opening your class with a *brief* anecdote about a dream, encounter, other event in your life, something in the news, or simply your thoughts about something—spoken at normal-to-rapid speed in the target language. Explain in advance that you will not expect them to understand all that you say, but simply to start getting a "feel" for the language.

Home Economics

116. Take still photos of class members at special events such as dinners, fashion shows, field trips, and special projects. Build a scrapbook or bulletin board with these and display on campus or at Open House.
117. Encourage students to enter their projects in outside contests such as county fairs.

118. Collect cartoons related to food costs, consumer problems, and family relationships.
119. Instruct students on the means of obtaining and completing consumer complaint forms.
120. Set up authentic food-tasting booths; set up campus tasting contests.
121. Establish a play school or nursery in conjunction with a child development class.
122. Use a large box wrapped as a gift to open a lesson on toy safety or toy purchasing.
123. Allow the students to plan and do the shopping for a food lab assignment.
124. Plan a unit on cultural foods, using the traditions, costumes, and music of a particular culture. Have the students decorate the room. Invite the principal for a meal and visit.
125. Take a trip to Small Claims Court. (Plan ahead and obtain permission from the Court.)
126. Plan a color and grooming unit. Ask students to match their personal colors closely to magazine photos. Match to color schemes to determine the most complimentary colors to wear or to use in household furnishings.
127. Try these nutrition-related games:
 - a. Bring a bag full of all types of foods. Ask students to group them into the four basic food types. Let them eat the food as a reward for correct classifications.
 - b. Pin the name of a food on a student's back. The student must ask another student questions until he or she guesses which food he or she is. Only yes-or-no response questions may be asked.
128. Plan a bulletin board displaying pictures of 100-calorie portions of basic nutritional foods and popular fad foods that contain only empty calories. The display can motivate a discussion on foods with calories and nutrients versus foods with empty calories.
129. Try this for motivation toward a unit on laundry: Pin the names of different garments on the back of students. The students are then to sort themselves into different wash loads. This is a fun game that motivates and involves an entire class.
130. For a clothing unit hold an "idea day." Ask each student to bring in an idea of something that can be done to give clothes a new look, a fun touch, or an extended wearing life. Ideas they may come with include: appliques, embroidery, tie-dye, batik, colorful patches, and restyling old clothes into current or creative fashions.
131. Have the students write, practice, and present skits, perhaps for videotape presentation, on consumer fraud.
132. Take the class on a field trip to the school cafeteria, a nearby supermarket, or a large restaurant. (Make necessary arrangements.)
133. Students should become familiar with shelving practices in stores and supermarkets.

Mathematics

134. Plan an in-class mathematical debate.
135. Try a game of mathematical baseball. Divide the class into two teams. Arrange

the room as a baseball field. The "pitcher" fires content questions to the "hitter." This can be a fun way to review for an examination.

136. Arrange mathematical tournaments with other schools.
137. Do a mathematical survey of your school campus.
138. Plan with your class a role-play unit where members role-play the solar system. Students calculate their weights, set up a proportion system, find a large field, and on the final day actually simulate the solar system, using their own bodies to represent the sun, planets, and moons. Arrange to have it photographed.
139. Have your students build mathematical models. Pyramids can be of special interest to the students.
140. Encourage your students to look for evidence of Fibonacci number series* in nature and in manufactured objects. Here are some examples of where evidence may be found: piano keyboard, petals on flowers, spermatogenesis and oogenesis, and many places in mathematics. Perhaps your students might like to organize a Fibonacci Club.
141. Become familiar with the many games available for teaching mathematics.
142. Divide the class into two teams—the metric team and the nonmetric team. Have each team solve a series of measurement conversion problems. One team would convert nonmetric to metric, the other would convert metric to nonmetric. The team with the most problems correct wins.
143. Join with a physical science class and visit a science museum.
144. Invite an engineer, physical scientist, or computer program writer to speak to the class on how mathematics applies to their profession.

Music

145. Hang a cloth bag on the wall. Buy a sack of potatoes. For every song that students learn to sing, get a potato, write a date and a title of the song learned, and put the potato in the bag. At the end of the semester, buy a MacDonald's certificate for each potato and divide them among the students.
146. Take the class to a concert. They can observe others playing their instruments.
147. Have students find ways in which music is used around them, e.g., for television.
148. Periodically during the school year, after the students are very familiar with a certain piece (have memorized it or can play it perfectly) switch the band or orchestra around by not putting any two of the same instruments together. For example, put no flutes next to each other, put a cello by a trumpet, a violin beside a drummer, or a saxophone next to a viola and bass. This ensures that each person knows his own part and can carry his own weight in terms of performance. This can also be done in chorus, mixing sopranos with altos, tenors, and basses, etc.
149. Find a popular song on the radio that students like. Transpose the melody into unfamiliar keys for each instrument. This makes the student want to learn the song, but in the process the student will have to become more familiar with his or her instrument.
150. Set aside one weekend morning a month and hold small informal recitals (workshops) allowing students to participate/observe the performance situation(s) among their peers and themselves. (Students might be told previously about

*Fibonacci numbers are a series of numbers, each of which is the sum of the preceding two, i.e., 1, 1, 2, 3, 5, 8, ...

- these "special days" and encouraged to prepare a selection of their own choosing.)
151. Listen to current popular musical recordings and discuss them as to musical content and performance techniques.
 152. As an extra credit project, have students prepare brief oral reports on past composers and give an example of their music by recording, performance. (The student may even enjoy dressing the part of the composer.)
 153. Trumpet Clinics: A. With trumpet teachers; B. With trumpet performers (all styles of music); C. With other students from other schools.
 154. Plan different money-making projects such as singing telegrams.
 155. Play a group-activity rhythm game, one such as the "Dutch Shoe Game" to get students to cooperate, work together, and enjoy themselves using rhythm. If students are willing to sit on the floor, it can be adaptable to any age level. Participants sit in a circle, and as the song is sung, each person passes one of his or her shoes to the person on the right in rhythm to the music. Shoes continue to be passed as long as verses are sung. Those with poor rhythm will end up with a pile of shoes in front of them!
 156. Choose a rhythmical, humorous poem or verse to conduct. The students read the poem in chorus, while the teacher stands before them and conducts the poem as if it were a musical work. Students must be sensitive to the intonation, speed, inflection, mood, and dynamics that the teacher wants them to convey in their reading.
 157. Play the game "Name that Tune" using works by composers the students have been studying, or take various styles of music and ask them to identify them with composers.
 158. Do a series of studies of non-Western music. As a break from studying just Western music, once a week or once every two weeks prepare a program to expose students to the music of a different country, for example, Japan or India or the Polynesian Islands. Records can be used to introduce the sound of the music, slides can be used to view the country and its people, and instruments can be found from different countries. Guest speakers may be available to lecture or perform.
 159. A field trip to the opera or a concert can be scheduled. Group rates are usually available, with half price for students as a rule.
 160. To motivate a marching band and to let them know how much work goes into making a half-time show, have students form groups and let each group design a portion of a half-time show. For example, one group can put together what tunes should be played and another group could put together the entrance movements of the show.
 161. Pick students at random to be the drum major (student band leader) and lead the band in a tune or a given portion of a half-time show; this will not only stimulate interest, but also help students to be able to organize musical patterns.
 162. Have the students bring in some of their favorite recordings of popular present-day bands. Play the recordings for the entire class while analyzing each band's style. Give a contest by dividing the class and having the students attempt to classify each band by the style of each recording.
 163. To improve marching band skills and to motivate precision marching, let each section of the band (brass, woodwinds, and percussion) demonstrate its marching ability before the rest of the band. At the end of the semester the best marching section can be rewarded.

164. Give students the opportunity to write their own original composition which can be performed in public.

Physical Education

165. Students will choose the famous athlete whom they most admire. A short report will be written about the athlete. The student will then discuss the attributes and/or characteristics that they admire in the athlete, and how they feel they can emulate those qualities.
166. Students will make up an exercise routine to their favorite record and share it with the class.
167. Have the class divide into groups. Given the basic nonlocomotive skills, have each group come up with a "people machine." Each student within the group is hooked up to another demonstrating a nonlocomotive skill and adding some sort of noise to it. Have a contest for the most creative people machine.
168. Have a special talent day—where students may demonstrate an individual talent or group talent, relating it to physical education. (Might have them keep this in mind, practice on rainy days, and present it on a rainy day)
169. Have a mini-Olympic day where students help create the various events to be used, and give honors to winners.
170. Students are given a chance to design a balance beam routine that has two passes on the beam and that must include: front support mount, forward roll, leap, low or high turn, visit, chasse, and cross support dismount. These routines will be posted to show the variety of ways the different maneuvers can be put together.
171. Divide the class into groups. Have them create a new game or activity for the class, using only the equipment they are given. Let the class play these newly created games.
172. Use Friday as a game day—do not introduce anything new. Review what was taught earlier in the week. Have some kind of competitive games or relays related to the skills previously learned.
173. Videotaping is a good device to show student their errors and their improvements in a skill such as batting. It helps them see what they are doing and helps them develop a kinesthetic awareness of their movement.
174. Organize and make available to your students a trip to a professional, collegiate, or any highly skilled team's game. This usually will motivate them if they are at all interested in the sport.
175. Engage a guest speaker, preferably a professional athlete or coach in the sport you are teaching, to talk or demonstrate specific skills.
176. Exercises done to popular music. Let students take turns bringing in music and leading the exercises. The teacher will furnish a general outline to follow.

Science

177. Have your students create microscopes with bamboo rods and drops of water at each end.
178. Have your students make litmus indicators from petals of flowers.

179. Assign themes or problems that require students to predict or hypothesize decision making in a critical incident.
180. Use Polaroid or video cameras for students to record and immediately share observations.
181. Use cassette-tape recorders to record sounds of the environment. Compare day and night sounds. (This can also be helpful in poetry writing.)
182. If you are a life science teacher, make sure your classroom looks like a place for studying life rather than death.
183. The technique of "show and tell" is an excellent motivator and can be modified to be useful to the secondary school teacher. Do not allow students to "rip off" the environment of such things as flowers or beneficial insects or tide-pool life.
184. Encourage students to hypothesize, then to collect data, using their own environment.
185. Use your imagination. If you want, for example, to study predator-prey relationships but you are located in an inner-city school, then your class might use landlord-tenant situations for the study.
186. Have your students make their own cosmetics. Share what you are doing with the Home Economics teachers—perhaps you can combine your efforts.
187. Divide your class into groups and ask each group to create an environment for an imaginary animal, using discarded items from the environment. By asking questions each group will try and learn about other groups' "mystery" animals.
188. Be aware of relevant programs being shown on local television stations. Perhaps you can let students observe one during class time, by pretaping if necessary.
189. If your students have never seen an ocean, a forest, or mountains, and you cannot take them on an appropriate field trip, then do the next best thing and go yourself (perhaps during vacations) and take slides or moving pictures to show them. (Become aware of any income-tax advantages available to you as a teacher.)
190. Become familiar with the many educational games available for teaching science.
191. Students can summarize the steps in a process (for example, setting up a distillation) by *taking photos* of each step to illustrate an instruction book for other students.
192. Let each student "adopt" a chemical element. The student then researches that element and becomes the class expert whenever that particular substance comes up in discussion. There could be a special bulletin board for putting up questions on interesting or little-known facts about the elements.
193. Have the students bring to class current newspaper clippings on environmental problems having to do with chemistry (toxic waste spills, pesticide application, etc.). Have students form discussion groups to try to find practical ways to deal with the problem. This could become a longer-term project, with library research and letter-writing for more information.
194. Milk can be precipitated, separated, and the solid product dried to form a very hard substance that was, in the days before plastic, used to make buttons. Let students make their own buttons from milk.
195. Spray paint molecular models gold. Give the "golden molecule" award for exceptional lab projects, etc. Or give the award for the most disastrous failure (*if the student has a good sense of humor*). The award could be given to a lab group each week to encourage working as a group.

196. Have your students build a model of a molecule using gumdrops and tooth picks. Different colored gumdrops are to represent different elemental atoms. When they show the teacher that they have correctly named and constructed their models, they can eat the gumdrops.
197. Blow a balloon up in class and hold it between your thumb and forefinger. Let it go. Explain that *you* have just demonstrated potential energy and rocket propulsion. Go into the lecture on potential energy.
198. Have your students make their own useful items as related to science, things such as the following:
 - a. Library paste: one-half cup cornstarch to three-fourths cup cold water, stir to paste, then add six cups of boiling water and stir until translucent, then cool to room temperature.
 - b. Baby oil: two tablespoons of almond oil, eight tablespoons of olive oil, and a few drops of perfume, stir all ingredients together—keep out of reach of children.
 - c. Concrete cleaner: dry mix these—sodium metasilicate, three and one-quarter cups; trisodium phosphate, three-quarters cup; soda ash, one-half cup.

Social Science

199. Establish a special "people and things" bulletin board.
200. Have your class play charades to learn geography.
201. Set up a classroom broadcast studio where students prepare and present news broadcasts.
202. Take your class on an imaginary trip around the world. Students can role-play countries.
203. Let your class plan how they would improve their living environment, beginning with the classroom, then moving out to the school, home, and community.
204. Become familiar with the many games available for teaching social studies. Refer to Chapter 11 for sources.
205. Start a pictorial essay on the development and/or changes of a given area in your community, e.g., a major corner or block adjacent to the school. This is a study that would continue for years and that has many social, political, and economic implications.
206. Start a folk hero study. Each year ask "What prominent human being who has lived during the twentieth century do you most admire?" Collect individual responses to the question, tally, and discuss. After you have done this for several years you may wish to share with your class for discussion purposes the results of your surveys of previous years.
207. Play the *Redwood Controversy* game. (See Chapter 11.) Perhaps you and your class can design a simulation game on a controversial social issue.
208. Role-play a simulated family movement West in the 1800s. What items would they take? What would they throw out of the wagon to lighten the load?
209. Have students collect music, art, or athletic records from a particular period of history. Compare with today. Predict the future.
210. Using play money, establish a capitalistic economic system within your classroom. Salaries may be paid for attendance and bonus income for work well

done, taxes may be collected for poor work, and a welfare section established in a corner of the room.

211. Divide your class into small groups and ask that each group make predictions as to what world governments, world geography, world social issues, or some other related topic will be like some time in the future. Let each group give its report, followed by debate and discussion.
212. "Alphabet Geography": A place is given by the teacher, such as a state, city, river, etc. The next person must name a place starting with the same letter as the last in that previously mentioned. Students are eliminated or given points. This game can be used as a drill to acquaint students with place names and where these places are. The class can be divided into groups, or students can stand individually.
213. Use a mandala to demonstrate the importance of individual experiences, as in interpreting current events.

With the preceding suggestions we have only scratched the surface in providing ideas. The total possibilities are limited only by the courage and imagination of the teacher.

A source of valuable information, including ideas for motivation, can be the professional journal(s) for your field.

Kim, E.C., & Kellough, R.D. (1991). *A Resource Guide for Secondary School Teaching: Planning for Competence*. Fifth Edition. New York: Macmillan.

Frames for Better Training: Icebreakers and Closers

Greg Hanek

Frame activities can be thought of as templates or shells that can have any content poured into them. Using frames can speed up your development of "new" activities, allow you to cover new content while still having a sense of how to run an activity, and provide a sense of continuity in your training. Today's workshop will provide some frame activities for the beginning and ending of workshops, specifically some icebreakers and closers.

What are Icebreakers and Closers?

Angus Reynolds' *The Trainer's Dictionary* defines icebreakers as climate-setting activities to help members of a group get to know one another and to prepare for a training session. Trainers all too often warm-up their groups through a common introduction activity: "Let's go around the room and tell our name, job title, organization, and why we're here at the workshop..." Julius Eittington observed that "this ritual may have some value, but all too often it becomes meaningless because the required responses are inaudible and group members do not listen or are bored by the routine involved." Eittington goes on to say "it is essential to use more dynamic, experiential activities (icebreakers) for warm-up purposes" since the odds are against using the usual introductions to motivate a group.

Closers are the mirror images of icebreakers, according to Sivasailiam Thiagarajan, a reknown expert on gaming and simulations. He says "they are activities that help you wind down your workshop. An effective closer brings a training session to a memorable close." Trainers often only concentrate on the actual content of their workshops, and may overlook the importance of activities like icebreakers and closers and their effect on a successful workshop.

This workshop will introduce you to some activities that lend themselves to becoming frames. Try to find the frames in these activities by stripping out the specific content and using these activities for your own subject area.

SOURCES

Eittington, J. E., (1984) *The Winning Trainer*, Houston, Gulf Publishing Company.

Thiagarajan, S., (1998) *Thiagi GameLetter: Seriously fun activities for trainers, facilitators, and managers*, San Francisco, Jossey-Bass/Pfeiffer, April, v1 n2.

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Icebreaker: Talking String

TARGET AUDIENCE	Adult trainers
PURPOSE	<ul style="list-style-type: none">■ To become more comfortable talking in front of a group■ To learn (or continue to learn) fellow participants' names■ To become better acquainted with fellow participants' attitudes, values, concerns, aspects of personalities, and so on.
PARTICIPANTS	Three or more. If you have more than fifteen participants, divide them into roughly equal-sized groups, and have them play independently.
TIME REQUIRED	<p>1 Minute: Change seating, pass out strings, and explain process</p> <p>2 Minutes per Participant: Speaking Activity</p> <p>15 Minutes: Debriefing</p>
PREPARATION	Cut a number of strings or threads so they are one to three feet long. Allow each participant to choose a string.
FLOW	Each participant is given a string. Participants are seated in a circle facing each other, with no barriers (e.g., desks or tables) between them. The first participant states their name and continues talking about the selected topic (e.g., why they are attending the workshop, what they hope to take away from the workshop, something they did in the past few days, ...) while steadily wrapping the string around their finger. When their string is all wound, the next participant says the name of all the previous participants in order, then begins winding their string and talking. The activity continues until all present have had a turn. Debrief this activity while still seated in the circle.
CONTINGENCY	Increase or decrease participant time allotment (can shorten or lengthen strings if given advance notice of time crunch) to fill available time.
DEBRIEFING ACTIVITIES	Question and answer about participants' experience
DEBRIEFING QUESTIONS	<ol style="list-style-type: none">1. How did you feel during this activity?2. Did you feel more comfortable talking in front of the group because you had the string?3. What are some interesting things you have just learned during this activity?4. Was this exercise made more effective by the use of props? How?5. Do you think this would have been as effective if we had not been sitting in this circle?6. Can you imagine other possible uses for this activity?

Icebreaker: Five Questions

Stolen from *Thiagi GameLetter: Seriously fun activities for trainers, facilitators, and managers*, March 1998, v1 n1, by way of David Gouthro of Vancouver, B.C.

TARGET AUDIENCE	Adult trainers
PURPOSE	<ul style="list-style-type: none">■ To help participants become acquainted with each other■ To help participants to focus on the workshop
TIME	15–20 Minutes
PARTICIPANTS	Six or more. If you have more than fifteen participants, divide them into roughly equal-sized groups, and have them play independently.
PREPARATION	<p>Prepare five questions related to the participants and the workshop, in increasing order of disclosure. Here are some questions for a sample workshop on time management:</p> <ol style="list-style-type: none">1. What is your name, job title, and organization?2. How much of your work time is spent in meetings?3. How would you rate your current level of time management ability?4. What is your primary expectation for this workshop?5. What is the stupidest way you waste your time?
FLOW	<ol style="list-style-type: none">1. Ask the participants to stand up and move around the room. Tell participants to find partners, preferably someone they have not met before.2. Ask the first question from your list. Ask the partners to share their answers. Warn the participants they will have to recall and share their partners' answers later.3. After an appropriate pause, ask the participants to find new partners.4. Ask the second question from your list. As before, ask the partners to share their responses, listening carefully to one another.5. Repeat the process of forming new partnerships and responding to the remaining questions.6. Ask the participants to return to their seats. Randomly select a participant to stand up. He or she will be "introduced" by five other participants, reporting his or her response to the five questions, one question at a time.7. Repeat this activity by asking different participants to stand up. Keep the five-person introductions at a rapid pace.
CONTINGENCY	If there are too many participants, stop after six introductions or so. Tell the group that you will continue the five-person introductions from time to time throughout the workshop.

What Can an Icebreaker Do?

Here is a list of possible purposes for icebreakers, stolen directly from Thiagarajan. Icebreakers can serve several useful functions for trainers.

- Build group identity and cohesiveness.
- Build momentum for the next phase of the program.
- Can reduce the anxieties of the trainer, too!
- Communicate administrative and logistical information.
- Develop trust among participants and with the trainer as well.
- Distract the participants from their initial anxieties.
- Encourage appropriate levels of self-disclosure.
- Encourage creative playfulness among the participants.
- Encourage interactive learning among the participants.
- Energize the participants.
- Establish ground rules.
- Focus the participants' attention on the workshop.
- Gain "instant involvement" of everyone.
- Help form teams.
- Help involve shy people.
- Help participants learn about the resources of the group.
- Help the participants find partners for future activities.
- Help the participants set individual goals.
- Help develop credibility of the trainer as a facilitator not a "leader" or a lecturer.
- Identify important characteristics of the participants.
- Increase cohesiveness and collaboration among the participants.
- Introduce the participants to one another.
- Introduce the workshop materials.
- Orient participants to the workshop format.
- Pretest the participants to make certain they have the prerequisite skills and knowledge.
- Preview the workshop objectives.
- Provide a common baseline experience for later analysis.
- Provide a content outline for the workshop.
- Provide a framework (an advance organizer) for mentally storing the workshop content.
- Put the participants at ease.
- Set a climate, tone and pace for the program, particularly if it is to be a participative one.

Thiagarajan, S., (1998) *Thiagi GameLetter: Seriously fun activities for trainers, facilitators, and managers*, San Francisco, Jossey-Bass/Pfeiffer, March, v1 n1.

Closer: Psychic Massage

Stolen from *Thiagi GameLetter: Seriously fun activities for trainers, facilitators, and managers*, April 1998, v1 n2.

TARGET AUDIENCE	Adult trainers
PURPOSE	To enhance the self-image of participants by identifying and enhancing their positive qualities in an exaggerated fashion.
TIME	5–10 Minutes. The activity will require about a minute and a half for each participant in a team.
PARTICIPANTS	Three or more. Divide participants into teams of three to five, and ask each team to play independently.
FLOW	<ol style="list-style-type: none">1. Ask each team to identify the member whose first name comes earliest in the alphabet. This participant is the first "victim."2. Ask the person to turn his or her back to the rest of the team.3. Using your own words, explain the rules of this activity:<ul style="list-style-type: none">■ Team members must make positive, uplifting statements about the person behind his or her back.■ They must talk loudly enough so that the person can hear everything they are saying.■ They have exactly one minute to talk about the person. <p>Important: Team members can make only positive, uplifting statements.</p> <ul style="list-style-type: none">■ If the team members cannot think of anything positive to say, they must make something up. <ol style="list-style-type: none">4. Announce the beginning of the first round. (A whistle or horn is useful for signalling the time.) Start a timer. Signal at the end of the one minute to conclude the first round.5. Ask the victim to turn around and face the other team members.6. The person seated to the left of the original victim becomes the next victim. The person turns his or her back on the rest of the team, and the activity continues until everyone has had a turn.7. Conclude the session by confirming that you definitely had a uniquely talented group of participants.
CONTINGENCY	If one or two teams have an "extra" member, bring them to the front of the room, one person at a time. Ask the person to turn his or her back to the rest of the participants. Ask the entire group to talk about this person, using the same rules as before.

What Can a Closer Do?

Just like icebreakers, closers can perform quite a few useful purposes. Here is a list of possible functions stolen directly from Thiagarajan.

- Administer the final criterion test, performance test, or certification test.
- Brainstorm change–management strategies for applying the new skills and knowledge
- Brainstorm follow–up strategies.
- Celebrate the successful completion of the workshop.
- Congratulate one another for achievements.
- Debrief the training experience.
- Develop joint projects.
- Discuss dangers and limitations of the new skills and knowledge.
- Discuss strategies for overcoming resistance to the application of the new techniques.
- Distribute and discuss the use of additional take–home materials.
- Establish networks, partnerships, and coaching buddies.
- Exchange information for future contacts.
- Give feedback to the facilitator on improving the training session.
- Hand out certificates and awards.
- Plan personal application activities.
- Prepare and share job aids, such as checklists and decision tables, to facilitate the application of new skills and knowledge.
- Relate the new skills and knowledge to real–world conditions.
- Review what was learned in the workshop.
- Review, share, and consolidate notes from the training session.
- Set up a clearing house for the mutual exchange of application notes.
- Shift the focus from the workshop to the workplace.
- Show the new skills and knowledge in a broader context.
- Start an informal newsletter.
- Thank participants for their contribution and participation.
- Tie up loose ends and clarify unclear concepts.

Thiagarajan, S., (1998) *Thiagi GameLetter: Seriously fun activities for trainers, facilitators, and managers*. San Francisco, Jossey–Bass/Pfeiffer, April, v1 n2.



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CHAT ROOM: An Icebreaker

Here is an interesting icebreaker that simulates the networking behavior in a typical social function.

Purpose

To energize the participants and to encourage interaction among them.

Time

15 - 20 minutes

Participants

10 to 30

Preparation

Prepare copies of an instruction sheet presenting the following content with suitable modifications:

Working-the-Room Contest!

We want you to meet and interact with as many other participants as possible.

This is a do-it-yourself icebreaker. You have approximately 7 minutes between now and 8:37 to mingle and chat with the other participants. Collect information from different people and share information about yourself. Use this contest as an excuse to behave like an intrusive extrovert.

Until 8:37, you are on your own. No other instructions will be given.

Exactly at 8:37, we will conduct a contest that will reward your ability to work the room. You will have two chances to win!

Flow

Briefing. As the participants come in, greet them at the door and give them a copy of the instruction sheet. If anyone asks you questions about the contest, repeat the information from the instruction sheet.

Keeping time. Blow a whistle and announce the beginning of the 7-minute period. Keep an eye on the clock. One minute before the start time of the contest, give an appropriate warning.

<http://thiagi.com/game-chatroom.html>

5/21/00

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Start the contest. At the exact time, blow the whistle. Tell the participants to stop talking with each other. Ask the participants to hide their name tags and any other personal identification.

Begin the memory contest. Explain that the first phase of the contest involves memory. Ask the participants to look around the room and estimate how many others they can name. Start an auction, asking the participants to bid the number of full names that they recall correctly. Identify the highest bidder (or bidders).

Conduct the memory contest. Ask the highest bidder to go around the room, whispering (to prevent the others from hearing) the full names of each participant. Ask all participants who have been correctly named to stand up. If the highest bidder has succeeded in correctly naming the number of participants she bid (or exceeded the number), she wins. Otherwise, repeat the activity with the second highest bidder.

Begin the popularity contest. Explain that the second phase of the contest involves visibility. Ask participants to stand up if they believe that their name will be remembered by the most people in the room. Bring this group to the front of the room. Point to the first contestant and ask the other participants to write her full name on a piece of paper. Announce the name of the participant and ask each participant to check the name written by her neighbor. Ask those who wrote the correct name to stand up, and count their number. Repeat the process with each of the other contestants. Identify the winner (or the winners) whose name was correctly written by the most other participants.

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URL: <http://www.thiagi.com/game-chatroom.html>
Revised: January 25, 2000

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TRIADS

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Ask participants to complete this sentence:

I am a(n) _____.

After they have done this, ask them to complete the same sentence 10 different ways.

Finally, have them pin their lists to their clothing, like a jumbo nametag.

Round 1. Participants wander around and form themselves into triads with as much similarity among them as possible. They have 3 minutes to do this.

Debrief to emphasize that there is more similarity among people than it meets the eye.

Round 2. Participants have 3 minutes to re-assemble themselves into triads with maximum diversity.

Debrief to emphasize that there are similarities among even the most diverse group. If there is any triad without a single element of similarity in their lists (which is very unlikely), ask everyone to brainstorm and generate 10 items of similarity.

Complementary diversity. Randomly assign participants to triads. Within each triad, ask participants to come up with an entrepreneurial venture which would exploit the unique combination of the three members. The venture should put to use the cultural and individual diversity among the members. If one member of the triad drops out, it should be impossible to provide the selected product or service.

Example: My triad decides to come up with a videotape training program to teach English as a second language to Indians. This requires my knowledge of India and of instructional design, Howard's skills in video production and his bland Midwest accent, and Aida's experience in teaching English as a second language and her understanding of the woman's point of view.

After 5 minutes ask different triads to report their business plan. Jointly decide which plan makes the best use of the unique combination of the triad's diversity.

Debrief to highlight how cultural diversity can provide the US with a leading edge in global

competitiveness.

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URL: <http://www.thiagi.com/game-triads.html>
Revised: June 10, 1997

Colorado court punishes with John Denver tunes

Associated Press

FORT LUPTON, Colo. — They don't take requests at this after-hours club and there's definitely no karaoke. The DJ is a police officer, and he's ready to bounce anyone who dances or talks.

Employing something like the aversion therapy in the movie *A Clockwork Orange*, Municipal Judge Paul Sacco requires people convicted of violating the city's noise ordinance to listen to music they don't like.

The noise scofflaws — most of whom got in trouble for playing their stereos too loud — gather once a month, on a weekend night, to listen to court-selected songs. The offenders are mostly young, so there is a heavy dose of lounge music, including Wayne Newton and Dean Martin, plus some Navajo flute music, bagpipes and John Denver songs.

During the most recent session, the group of seven heard one of the judge's own jazz compositions, "I'm Sleeping in My Car."

Seventeen-year-old David Mascarenas was apparently scared straight.

"I'm not going to jam no more," he said. "I took my stereo out already. I don't want to be hassled no more."

Court coordinator Patrice Redearth, who suggested the one-hour music treatment, said she got her first playlist by asking her 17-year-old "what the kids would hate."

The worst selection was the "Barney" theme song, said Ryan Bowles, 21, adding, "If you laugh they cite you for contempt."

The DJ policeman, Joe Morales, said there's something annoying for everyone, and it works. He recalled having problems "with one kid three or four times. He came here once and he hasn't been back."

A requiem might have been the most appropriate choice for the most recent session, Feb. 26. It certainly looked like a funeral. One teen wore a shirt that read, "I hate this town."

Sacco's program debuted Dec. 5 in this agricultural and industrial town of 5,200 people 30 miles north of Denver. The sessions are held in City Hall.

Sacco said the point he is trying to make is that "it's wrong to impose your music or style on someone else."

"You've got guys going around now with 15-inch speakers in a small car with a 1,000-watt amplifier," the judge said. "Maybe the ordinance will help them save their ears."

Music Punishment

The playlist for the most recent music punishment session:

■ **Beethoven's** Fifth Symphony, *Moonlight Sonata* and *Fuer Elise*

■ **Wayne Newton**, "Danke Schoen"

■ **Wayne Newton**, "Bill Bailey Won't You Please Come Home"

■ **Disney's** "This Old Man"

■ **Judge Paul Sacco**, "Sleepin in My Car"

■ **Trevor Jones**, "Theme from *The Last of the Mohicans*"

■ **Dean Martin**, "One Cup of Happiness"

■ **Dean Martin**, "It's Cryin' Time"

■ **Tony Orlando and Dawn**, "Tie a Yellow Ribbon Round the Ole Oak Tree"

■ **Hugo Montenegro**, "Theme from *The Good, the Bad and the Ugly*"

■ **Jerry Vall**, "Volare"

■ **Henry Mancini**, "Love Theme From *Romeo and Juliet*"

■ **John Denver**, "Sunshine on My Shoulders"

■ **Indian flute** instrumental

■ **Roy Rogers and Dale Evans**, "Happy Trails to You"

■ **Roger Whitaker**, "I'm Going to Leave Old Durham Town"

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STILL MORE GAMES TRAINERS PLAY

EXPERIENTIAL LEARNING EXERCISES

Edward E. Scannell
Arizona State University

AND

John W. Newstrom
University of Minnesota-Duluth

McGraw-Hill, Inc. (1991).
New York St. Louis San Francisco Auckland Bogotá
Caracas Lisbon London Madrid Mexico City Milan
Montreal New Delhi San Juan Singapore
Sydney Tokyo Toronto

A COAT OF ARMS

OBJECTIVE: To give participants the opportunity to describe qualities about themselves and to learn more about other attendees.

PROCEDURE: Reproduce the coat of arms as illustrated on page 291, or ask participants to draw a similar sketch.

In space 1, draw something that characterizes a recent "Peak Performance."

In space 2, sketch out something about yourself that very few people know.

Draw in space 3 a symbol of how you like to spend your spare time.

For space 4, fill in something you really are very good at.

In space 5, write or draw something that epitomizes your personal motto.

After each person finishes, form triads (preferably of attendees who don't know each other), and try to identify what the others' coats of arms signify.

Ask for several participants to describe their coats of arms to the group.

MATERIALS

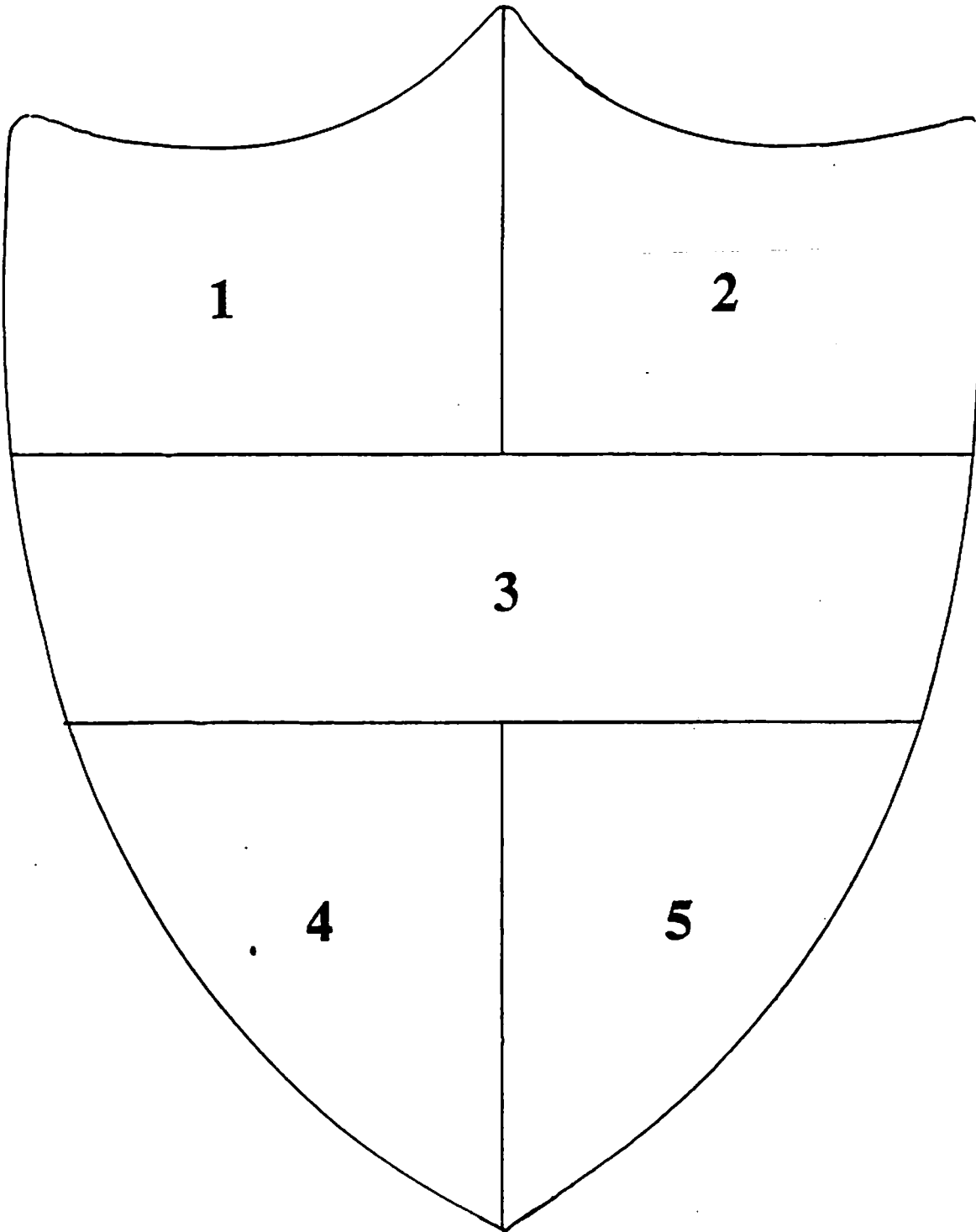
REQUIRED: None.

APPROXIMATE

TIME REQUIRED: 15-20 minutes.

SOURCE: Varied.

COAT OF ARMS



291

SELF-DISCLOSURE INTRODUCTIONS

OBJECTIVE: To provide innovative ways of introducing members to each other.

PROCEDURES: Instruct participants to take two items (e.g., family pictures, credit cards, rabbits' feet) from their purses, wallets, or pockets. When introducing themselves to the group, they should then use whatever they took out to help describe themselves in at least two ways (e.g., "I am superstitious"; "I'm such a tightwad that this is the first dollar I ever earned").

Ask each participant to state his/her name and attach an adjective that not only describes a dominant characteristic, but also starts with the first letter of her/his name (e.g., Sensuous Stan, Marvelous Mary, Inscrutable Ida, Dancing Diane, etc.).

Group members introduce themselves by name but also provide a nickname that they now have, once had, or would be willing to have if they could pick their own. Then, during breaks, members are encouraged to circulate and explore the reasons behind the announced nicknames.

Before introductions begin, ask the group members to brainstorm a list of provocative questions they would like to have each other answer (and be willing to do so). Have them screen the list to throw out those in questionable taste, and select the 2-3 that everyone feels comfortable with. Proceed with introductions that incorporate answers to the questions.

Distribute 3 x 5 cards containing participants' names, and a small number of items to be filled in on separate lines. When participants complete the items, have them pin, tape, or hold the cards up in front of them as they circulate in the room, allowing others to engage them in exploratory conversations about the items. Sample questions include: "The person living today whom I most admire is _____"; "My favorite all-time vacation was spent at _____"; "The best book/movie I ever read/saw was _____."

APPROXIMATE

TIME REQUIRED: One minute per person.

MATERIALS

REQUIRED: None.

SOURCES: Varied.

SCRAMBLED CITIES

- | | | | |
|-----------------|-------|---------------|-------|
| 1. OIAPER | _____ | 11. SNA SEJO | _____ |
| 2. REEDVN | _____ | 12. ULBOCKB | _____ |
| 3. ITSUAN | _____ | 13. ACHIWTI | _____ |
| 4. TEEATSL | _____ | 14. XNOIEPH | _____ |
| 5. LE OASP | _____ | 15. AAPT M | _____ |
| 6. LUULONH | _____ | 16. ULTAS | _____ |
| 7. WNE ALROESN | _____ | 17. GACOHIC | _____ |
| 8. SNA TANNOOI | _____ | 18. NAS GOIDE | _____ |
| 9. AKNSSA ITCY | _____ | 19. THOUSNO | _____ |
| 10. SOL SEELGNA | _____ | 20. PROTLDAN | _____ |

I.Q. TEST

Here are some real puzzlers for you! Decipher the hidden meaning of each set of words.

<p>1</p> <p>cry milk</p>	<p>2</p> <p>MAN campus</p>	<p>3</p> <p>111111</p> <p>another another another another another</p>	<p>4</p> <p>BUSINES</p>
<p>5</p> <p>CANCELLED</p>	<p>6</p> <p>○ ○ MOVING MOVING</p>	<p>7</p> <p>K U A I I</p>	<p>8</p> <p>sitting world</p>
<p>9</p> <p>ME ME ME day AL AL AL</p>	<p>10</p> <p>VIT _ MIN</p>	<p>11</p> <p>S T E P P I N G</p>	<p>12</p> <p>REVIRDTAES</p>
<p>13</p> <p>NO NO CORRECT</p>	<p>14</p> <p>head ache</p>	<p>15</p> <p>healhealheal</p>	<p>16</p> <p>MOUNTAIN</p>

Name

TREASURE HUNT

INSTRUCTIONS: Write your name on the first line. Circulate around the room finding one trait you have in common (i.e., "newcomer to city") and one item quite dissimilar (i.e., "has worked for same organization over 10 years" vs. "third job this year!")

<u>NAME</u>	<u>ALIKE</u>	<u>DIFFERENT</u>
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
6. _____	_____	_____
7. _____	_____	_____
8. _____	_____	_____
9. _____	_____	_____
10. _____	_____	_____

STUDENT MOTIVATION

Jere Brophy's review of research in 1987 found nine variables that teachers can manipulate in order to increase student motivation.

1. Student Interest - Motivation can be increased by relating the subject to what interests the student outside of school. Examples are videos, music, games and allowing students to select class activities.
2. Student Needs - Students are motivated when the activities they are involved in meet some of their basic needs. An example is allowing high school students to work in groups fulfilling the need for acceptance and belonging.
3. Novelty and Variety - Motivation is increased when activities are varied and interesting. Research shows that it is better to give two 15 minute lectures with a 5 minute activity between them than to give a 30 minute activity afterwards.
4. Success - When a student successfully completes a somewhat challenging task, motivation is increased. Teachers can ensure success by making goals and objectives clear, teaching in small steps, and checking to see if the students understand each step.
5. Student attributions for Success and Failure - Teachers must show students that failure is a result of lack of effort or an ineffective strategy, not ability. Students must be shown that success is the result of both ability and effort.
6. Tension - Tension is a feeling of concern a student has when he or she knows they will be required to demonstrate learning. Too much tension can be detrimental to learning. Teachers can raise the tension-level by moving around the room, calling on volunteers, and giving quizzes.
7. Feeling tone - Feeling tone is the climate in the classroom. Feeling tone can be made positive by treating students in a courteous manner, expressing sincere interest in the students and getting to know the students.
8. Feedback - Student motivation is increased when feedback is given concerning their performance. Feedback should be specific and given soon after the performance.
9. Encouragement - Teachers often point out all of the negative aspects of a student's work. Encouragement emphasizes positive aspects and communicates positive expectations for future behaviors.

Highlights of Research on Strategies for Motivating Students to Learn

Research on student motivation to learn indicates promising principles suitable for application in classrooms, summarized here for quick reference.

Essential Preconditions

1. Supportive environment
2. Appropriate level of challenge/difficulty
3. Meaningful learning objectives
4. Moderation/optimal use

Motivating by Maintaining Success Expectations

5. Program for success
6. Teach goal setting, performance appraisal, and self-reinforcement
7. Help students to recognize linkages between effort and outcome
8. Provide remedial socialization

Motivating by Supplying Extrinsic Incentives

9. Offer rewards for good (or improved) performance
10. Structure appropriate competition
11. Call attention to the instrumental value of academic activities

Motivating by Capitalizing on Students' Intrinsic Motivation

12. Adapt tasks to students' interests
13. Include novelty/variety elements
14. Allow opportunities to make choices or autonomous decisions

15. Provide opportunities for students to respond actively
16. Provide immediate feedback to student responses
17. Allow students to create finished products
18. Include fantasy or simulation elements
19. Incorporate game-like features
20. Include higher-level objectives and divergent questions
21. Provide opportunities to interact with peers

Stimulating Student Motivation to Learn

22. Model interest in learning and motivation to learn
23. Communicate desirable expectations and attributions about students' motivation to learn
24. Minimize students' performance anxiety during learning activities
25. Project intensity
26. Project enthusiasm
27. Induce task interest or appreciation
28. Induce curiosity or suspense
29. Induce dissonance or cognitive conflict
30. Make abstract content more personal, concrete, or familiar
31. Induce students to generate their own motivation to learn
32. State learning objectives and provide advance organizers
33. Model task-related thinking and problem solving

—Jere Brophy

Motivation

Personal Influences on motivation to learn:

Cognitive Filters:

beliefs about competence and control
clarity and salience of personal interests and goals
personal expectations for success or failure

Intrinsic Motivation to learn:

All individuals are naturally curious and enjoy learning but intense negative cognitions or emotions thwart this enthusiasm

We can encourage through the use of challenge, curiosity, control & fantasy in the classroom.

Task effects on motivation to learn:

curiosity, creativity, and higher-order thinking are stimulated by relevant, authentic learning tasks of optimal difficulty and novelty for each student.

Grading

Include positive before negative comments on papers

Respond appropriately to creative products

Wish students "good effort", not "good luck"

Give students a positive list of things which will lead to improvement, not a list of all the things that are wrong

Class Design

Give flexibility in assignments, due dates or formats

Incorporate authentic tasks

For higher level tasks carefully chose ambiguity level and feedback availability

Communicate respect for your students abilities through the tasks that you choose and the control that you give them

Daily Meeting Design

Take into account difficulty of material

Design interactive and interesting activities

Use cooperative learning, debates, or group

discussions to facilitate higher level

thinking but remember it will take more than 15 seconds

Alternate delivery systems

Minimize social comparison, encourage learning for the sake of learning

Encourage students to link to what they do well

Introduce tasks so that applicability is stressed

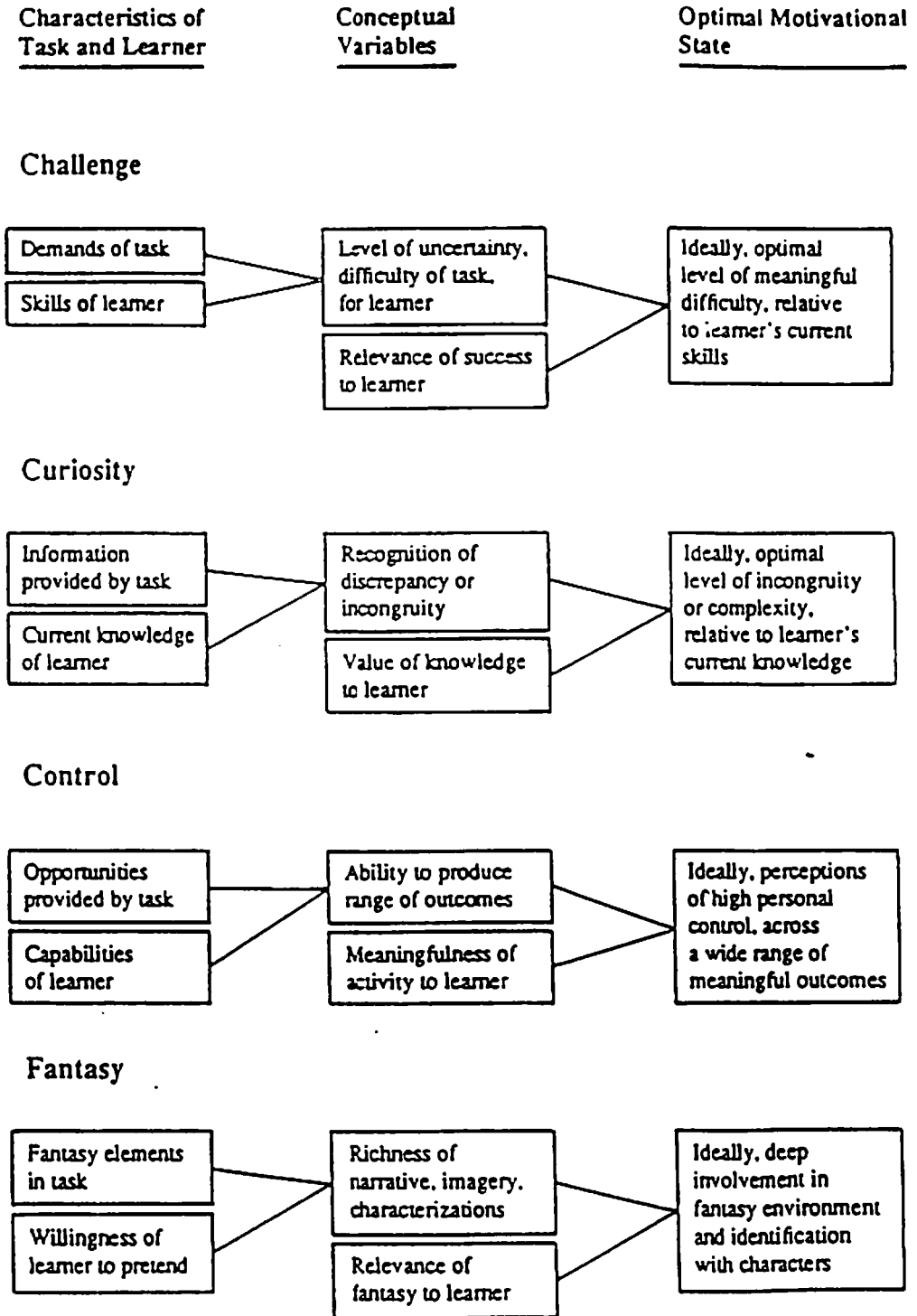


Figure 2. Sources of intrinsic motivation.

Lepper & Hodell (1989)
Intrinsic Motivation in the Classroom
 In Ames & Ames (1984) #21
 Page 127

Follow-up Activity Sheet 6-2

RATE YOUR FAVORITE THINGS

DIRECTIONS: Read about the things or activities in each of the categories below. Rate your favorite thing in each category as number 1, your second favorite as number 2. Continue numbering each item. Add other things if you would like.

Treats

Chocolate Bar
Pizza Party
Fast Food Hamburgers
Hot Dogs
Soft Drinks
Popcorn Party

In-class Activities

Work Out in Gym
Play Computer Games
Listen to Music with Headphones
Shoot Baskets
Free Time
Play Board Games/Cards/Dominos

Out-of-Class Activities

Have a Friend Spend the Night
Spend the Night with a Friend
Go Skating
Eat Out
Attend a Sporting Event

Things

Baseball Cards
Athletic Poster
Pocket Cars
Ball
Stickers
Music Cassette

Other



Tools for Teaching

Barbara Gross Davis

University of California, Berkeley

Jossey-Bass Publishers (1993)
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Barbara Gross Davis

Motivating Students

[From **Tools for Teaching** by Barbara Gross Davis; Jossey-Bass Publishers: San Francisco, 1993. This chapter may not be copied or reprinted without permission.]

Some students seem naturally enthusiastic about learning, but many need or expect their instructors to inspire, challenge, and stimulate them: "Effective learning in the classroom depends on the teacher's ability ... to maintain the interest that brought students to the course in the first place" (Ericksen, 1978, p. 3). Whatever level of motivation your students bring to the classroom will be transformed, for better or worse, by what happens in that classroom.

Unfortunately, there is no single magical formula for motivating students. Many factors affect a given student's motivation to work and to learn (Bligh, 1971; Sass, 1989): interest in the subject matter, perception of its usefulness, general desire to achieve, self-confidence and self-esteem, as well as patience and persistence. And, of course, not all students are motivated by the same values, needs, desires, or wants. Some of your students will be motivated by the approval of others, some by overcoming challenges.

Researchers have begun to identify those aspects of the teaching situation that enhance students' self-motivation (Lowman, 1984; Lucas, 1990; Weinert and Kluwe, 1987; Bligh, 1971). To encourage students to become self-motivated independent learners, instructors can do the following:

- Give frequent, early, positive feedback that supports students' beliefs that they can do well.
- Ensure opportunities for students' success by assigning tasks that are neither too easy nor too difficult.
- Help students find personal meaning and value in the material.
- Create an atmosphere that is open and positive.
- Help students feel that they are valued members of a learning community.

Research has also shown that good everyday teaching practices can do more to counter student apathy than special efforts to attack motivation directly (Ericksen, 1978). Most students respond positively to a well-organized course taught by an enthusiastic instructor who has a genuine interest in students and what they learn. Thus activities you undertake to promote learning will also enhance students' motivation.



General Strategies

Capitalize on students' existing needs. Students learn best when incentives for learning in a classroom satisfy their own motives for enrolling in the course. Some of the needs your

students may bring to the classroom are the need to learn something in order to complete a particular task or activity, the need to seek new experiences, the need to perfect skills, the need to overcome challenges, the need to become competent, the need to succeed and do well, the need to feel involved and to interact with other people. Satisfying such needs is rewarding in itself, and such rewards sustain learning more effectively than do grades. Design assignments, in-class activities, and discussion questions to address these kinds of needs. (Source: McMillan and Forsyth, 1991)

Make students active participants in learning. Students learn by doing, making, writing, designing, creating, solving. Passivity dampens students' motivation and curiosity. Pose questions. Don't tell students something when you can ask them. Encourage students to suggest approaches to a problem or to guess the results of an experiment. Use small group work. See "Leading a Discussion," "Supplements and Alternatives to Lecturing," and "Collaborative Learning" for methods that stress active participation. (Source: Lucas, 1990)

Ask students to analyze what makes their classes more or less "motivating." Sass (1989) asks his classes to recall two recent class periods, one in which they were highly motivated and one in which their motivation was low. Each student makes a list of specific aspects of the two classes that influenced his or her level of motivation, and students then meet in small groups to reach consensus on characteristics that contribute to high and low motivation. In over twenty courses, Sass reports, the same eight characteristics emerge as major contributors to student motivation:

- Instructor's enthusiasm
- Relevance of the material
- Organization of the course
- Appropriate difficulty level of the material
- Active involvement of students
- Variety
- Rapport between teacher and students
- Use of appropriate, concrete, and understandable examples



Incorporating Instructional Behaviors That Motivate Students

Hold high but realistic expectations for your students. Research has shown that a teacher's expectations have a powerful effect on a student's performance. If you act as though you expect your students to be motivated, hardworking, and interested in the course, they are more likely to be so. Set realistic expectations for students when you make assignments, give presentations, conduct discussions, and grade examinations. "Realistic" in this context means that your standards are high enough to motivate students to do their best work but not so high that students will inevitably be frustrated in trying to meet those expectations. To develop the drive to achieve, students need to believe that achievement is possible -which means that you need to provide early opportunities for success. (Sources: American Psychological Association, 1992; Bligh, 1971; Forsyth and McMillan, 1991 -1 Lowman, 1984)

Help students set achievable goals for themselves. Failure to attain unrealistic goals can disappoint and frustrate students. Encourage students to focus on their continued

improvement, not just on their grade on any one test or assignment. Help students evaluate their progress by encouraging them to critique their own work, analyze their strengths, and work on their weaknesses. For example, consider asking students to submit self-evaluation forms with one or two assignments. (Sources: Cashin, 1979; Forsyth and McMillan, 1991)

Tell students what they need to do to succeed in your course. Don't let your students struggle to figure out what is expected of them. Reassure students that they can do well in your course, and tell them exactly what they must do to succeed. Say something to the effect that "If you can handle the examples on these problem sheets, you can pass the exam. People who have trouble with these examples can ask me for extra help." Or instead of saying, "You're way behind," tell the student, "Here is one way you could go about learning the material. How can I help you?" (Sources: Cashin, 1979; Tiberius, 1990)

Strengthen students' self-motivation. Avoid messages that reinforce your power as an instructor or that emphasize extrinsic rewards. Instead of saying, "I require," "you must," or "you should," stress "I think you will find. . ." or "I will be interested in your reaction." (Source: Lowman, 1990)

Avoid creating intense competition among students. Competition produces anxiety, which can interfere with learning. Reduce students' tendencies to compare themselves to one another. Bligh (1971) reports that students are more attentive, display better comprehension, produce more work, and are more favorable to the teaching method when they work cooperatively in groups rather than compete as individuals. Refrain from public criticisms of students' performance and from comments or activities that pit students against each other. (Sources: Eble, 1988; Forsyth and McMillan, 1991)

Be enthusiastic about your subject. An instructor's enthusiasm is a crucial factor in student motivation. If you become bored or apathetic, students will too. Typically, an instructor's enthusiasm comes from confidence, excitement about the content, and genuine pleasure in teaching. If you find yourself uninterested in the material, think back to what attracted you to the field and bring those aspects of the subject matter to life for your students. Or challenge yourself to devise the most exciting way to present the material, however dull the material itself may seem to you.



Structuring the Course to Motivate Students

Work from students' strengths and interests. Find out why students are enrolled in your course, how they feel about the subject matter, and what their expectations are. Then try to devise examples, case studies, or assignments that relate the course content to students' interests and experiences. For instance, a chemistry professor might devote some lecture time to examining the contributions of chemistry to resolving environmental problems. Explain how the content and objectives of your course will help students achieve their educational, professional, or personal goals. (Sources: Brock, 1976; Cashin, 1979; Lucas, 1990)

When possible, let students have some say in choosing what will be studied. Give students options on term papers or other assignments (but not on tests). Let students decide between two locations for the field trip, or have them select which topics to explore in greater depth. If possible, include optional or alternative units in the course. (Sources: Ames

and Ames, 1990; Cashin, 1979; Forsyth and McMillan, 1991; Lowman, 1984)

Increase the difficulty of the material as the semester progresses. Give students opportunities to succeed at the beginning of the semester. Once students feel they can succeed, you can gradually increase the difficulty level. If assignments and exams include easier and harder questions, every student will have a chance to experience success as well as challenge. (Source: Cashin, 1979)

Vary your teaching methods. Variety reawakens students' involvement in the course and their motivation. Break the routine by incorporating a variety of teaching activities and methods in your course: role playing, debates, brainstorming, discussion, demonstrations, case studies, audiovisual presentations, guest speakers, or small group work. (Source: Forsyth and McMillan, 1991)

De-emphasizing Grades

Emphasize mastery and learning rather than grades. Ames and Ames (1990) report on two secondary school math teachers. One teacher graded every homework assignment and counted homework as 30 percent of a student's final grade. The second teacher told students to spend a fixed amount of time on their homework (thirty minutes a night) and to bring questions to class about problems they could not complete. This teacher graded homework as satisfactory or unsatisfactory, gave students the opportunity to redo their assignments, and counted homework as 10 percent of the final grade. Although homework was a smaller part of the course grade, this second teacher was more successful in motivating students to turn in their homework. In the first class, some students gave up rather than risk low evaluations of their abilities. In the second class, students were not risking their self-worth each time they did their homework but rather were attempting to learn. Mistakes were viewed as acceptable and something to learn from.

Researchers recommend de-emphasizing grading by eliminating complex systems of credit points; they also advise against trying to use grades to control nonacademic behavior (for example, lowering grades for missed classes) (Forsyth and McMillan, 1991; Lowman 1990). Instead, assign ungraded written work, stress the personal satisfaction of doing assignments, and help students measure their progress.

Design tests that encourage the kind of learning you want students to achieve. Many students will learn whatever is necessary to get the grades they desire. If you base your tests on memorizing details, students will focus on memorizing facts. If your tests stress the synthesis and evaluation of information, students will be motivated to practice those skills when they study. (Source: McKeachie, 1986)

Avoid using grades as threats. As McKeachie (1986) points out, the threat of low grades may prompt some students to work hard, but other students may resort to academic dishonesty, excuses for late work, and other counterproductive behavior.

Motivating Students by Responding to Their Work

Give students feedback as quickly as possible. Return tests and papers promptly, and reward success publicly and immediately. Give students some indication of how well they have done and how to improve. Rewards can be as simple as saying a student's response was good, with an indication of why it was good, or mentioning the names of contributors: "Cherry's point about pollution really synthesized the ideas we had been discussing." (Source: Cashin, 1979)

Reward success. Both positive and negative comments influence motivation, but research consistently indicates that students are more affected by positive feedback and success. Praise builds students' self-confidence, competence, and self-esteem. Recognize sincere efforts even if the product is less than stellar. If a student's performance is weak, let the student know that you believe he or she can improve and succeed over time. (Sources: Cashin, 1979; Lucas, 1990)

Introduce students to the good work done by their peers. Share the ideas, knowledge, and accomplishments of individual students with the class as a whole:

- Pass out a list of research topics chosen by students so they will know whether others are writing papers of interest to them.
- Make available copies of the best papers and essay exams.
- Provide class time for students to read papers or assignments submitted by classmates.
- Have students write a brief critique of a classmate's paper.
- Schedule a brief talk by a student who has experience or who is doing a research paper on a topic relevant to your lecture.

Be specific when giving negative feedback. Negative feedback is very powerful and can lead to a negative class atmosphere. Whenever you identify a student's weakness, make it clear that your comments relate to a particular task or performance, not to the student as a person. Try to cushion negative comments with a compliment about aspects of the task in which the student succeeded. (Source: Cashin, 1979)

Avoid demeaning comments. Many students in your class may be anxious about their performance and abilities. Be sensitive to how you phrase your comments and avoid offhand remarks that might prick their feelings of inadequacy.

Avoid giving in to students' pleas for "the answer" to homework problems. When you simply give struggling students the solution, you rob them of the chance to think for themselves. Use a more productive approach (adapted from Fiore, 1985):

- Ask the students for one possible approach to the problem.
- Gently brush aside students' anxiety about not getting the answer by refocusing their attention on the problem at hand.
- Ask the students to build on what they do know about the problem.
- Resist answering the question "is this right?" Suggest to the students a way to check the answer for themselves.
- Praise the students for small, independent steps.

If you follow these steps, your students will learn that it is all right not to have an instant answer. They will also learn to develop greater patience and to work at their own pace. And

by working through the problem, students will experience a sense of achievement and confidence that will increase their motivation to learn.



Motivating Students to Do the Reading

Assign the reading at least two sessions before it will be discussed. Give students ample time to prepare and try to pique their curiosity about the reading: "This article is one of my favorites, and I'll be interested to see what you think about it." (Sources: Lowman, 1984; "When They Don't Do the Reading," 1989)

Assign study questions. Hand out study questions that alert students to the key points of the reading assignment. To provide extra incentive for students, tell them you will base exam questions on the study questions. (Source: "When They Don't Do the Reading," 1989)

If your class is small, have students turn in brief notes on the day's reading that they can use during exams. At the start of each class, a professor in the physical sciences asks students to submit a 3" x 5" card with an outline, definitions, key ideas, or other material from the day's assigned reading. After class, he checks the cards and stamps them with his name. He returns the cards to students at a class session prior to the midterm. Students can then add any material they would like to the cards but cannot submit additional cards. The cards are again returned to the faculty member who distributes them to students during the test. This faculty member reports that the number of students completing the reading jumped from 10 percent to 90 percent and that students especially valued these "survival cards." (Source: Daniel, 1988)

Ask students to write a one-word journal or one-word sentence. Angelo (1991) describes the one-word journal as follows: students are asked to choose a single word that best summarizes the reading and then write a page or less explaining or justifying their word choice. This assignment can then be used as a basis for class discussion. A variation reported by Erickson and Strommer (1991) is to ask students to write one complex sentence in answer to a question you pose about the readings and provide three sources of supporting evidence: "In one sentence, identify the type of ethical reasoning Singer uses in his article 'Famine, Affluence, and Morality.' Quote three passages that reveal this type of ethical reasoning" (p. 125).

Ask nonthreatening questions about the reading. Initially pose general questions that do not create tension or feelings of resistance: "Can you give me one or two items from the chapter that seem important?" "What section of the reading do you think we should review?" "What item in the reading surprised you?" "What topics in the chapter can you apply to your own experience?" (Source: "When They Don't Do the Reading," 1989)

Use class time as a reading period. If you are trying to lead a discussion and find that few students have completed the reading assignment, consider asking students to read the material for the remainder of class time. Have them read silently or call on students to read aloud and discuss the key points. Make it clear to students that you are reluctantly taking this unusual step because they have not completed the assignment.

Prepare an exam question on undiscussed readings. One faculty member asks her class whether they have done the reading. If the answer is no, she says, "You'll have to read the

material on your own. Expect a question on the next exam covering the reading." The next time she assigns reading, she reminds the class of what happened the last time, and the students come to class prepared. (Source: "When They Don't Do the Reading," 1989)

Give a written assignment to those students who have not done the reading. Some faculty ask at the beginning of the class who has completed the reading. Students who have not read the material are given a written assignment and dismissed. Those who have read the material stay and participate in class discussion. The written assignment is not graded but merely acknowledged. This technique should not be used more than once a term. (Source: "When They Don't Do the Reading," 1989)



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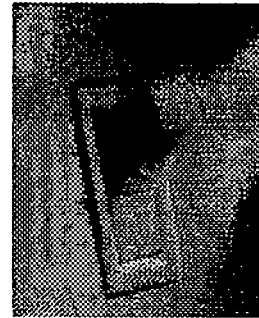
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Motivating students whether in a traditional classroom or an online course can present challenges. Online students may need extra motivation at times.



Encouraging Students

- Frequent, early, positive feedback.
- Early in the course provide opportunities for success.
- Provide students ways to personally find meaning in the material.
- Create an open and positive environment.
- Help students become a part of the learning community.
- Present a well-organized course.

Instructional Behaviors

- High, but realistic, expectations.
- Help students set their own goals.
- Tell students what they need to succeed.
- Avoid intense competition.
- Increase the difficulty of the material as the students master content.
- Give students feedback quickly.

What Do Students Say About Motivation?

Eight characteristics emerged when students were asked what aspects influenced the student's motivation.

- Instructor's enthusiasm.
- Relevance of material.
- Course organization.
- Appropriate difficulty of material.
- Active involvement of students.
- Variety.
- Rapport between instructor and students.
- Use of appropriate, concrete and understandable *examples*

Chapter VI

We'll Leave the Light on for You: Keeping Learners Motivated in Online Courses

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Introduction

Motivating online learners is a key challenge facing instructors in both higher education and corporate settings. Attrition rates and low participation levels in course activities are frequent instructor complaints about online learning environments. Part of the problem is a lack of sophistication in online tools and courseware (Bonk & Dennen, 1999). Added to this problem is that, even when tools exist for engaging and motivating students, instructors lack training in how to effectively use them. Instructors not only need to know the types of online and collaborative tools for engaging students, but also how to embed effective pedagogy when the technologies are weak.

Consider for a moment a traditional classroom. Why do students attend their classes? Perhaps their presence is being recorded by the instructor, or perhaps they are particularly interested in the topic. Regardless, upon enrolling in a face-to-face course, learners are aware that they are expected to devote significant blocks of time each week to that course. But why do students participate in face-to-face course activities? To start, they already are seated in the classroom, so they may as well participate. Additionally, the

effects of instructor modeling of desired activities and peer participation can motivate the reluctant learner to become more active.

In the online class, attendance is distinctly different. Unless explicitly told how their attendance will be noted, such as through a minimum number of messages posted per week, online learners do not know how or if their course participation will be determined. Consequently, online students turn to required assignments outlined in the course syllabus (Dennen, 2001). The end result is that students complete the basic graded components of the course, but little more.

Learner participation in an online class has sometimes been called an "act of faith" (Salmon, 2000). Key problems learners encounter include not knowing participation expectations, not feeling comfortable engaging in activities with people they have never met, and not having enough time to participate in activities. Whereas these first two reasons are clearly linked to motivation, the time factor is also related since highly motivated students will typically budget adequate time to participate.

In reviews of the research on motivation, certain key strategies are consistently found to be effective in conventional classrooms. For instance, effective instructors create a supportive but challenging environment, project enthusiasm and intensity, provide choice, create short-term goals, and offer immediate feedback on performance settings (Pintrich & Schunk, 1996; Reeve, 1996; Stipek, 1998). As these researchers have shown, instructors might also attempt to stimulate student curiosity, control, and fantasy. Naturally, they should make content personal and concrete by using relevant and authentic learning tasks and by allowing learners to create and display finished products. Finally, instructors should foster interaction with peers, create fun and game-like activities, embed structure as well as flexibility in assignments, and include activities with divergence or conflict.

Many of these principles relate to the highly regarded learner-centered psychological principles from the American Psychological Association (1993) and can be incorporated in Web-based instruction (Bonk & Cummings, 1998). In a recent Delphi study of top distance learning experts in the United States, many of these same principles (i.e., relevancy, authenticity, control, choice, interactivity, project-based, collaborative, etc.) were identified as key indicators of effective online learning environments (Partlow, 2001).

If so much is known, why are online courses often suffering from a lack of motivational elements? Problems exist in part because instructors are unsure of how to manipulate this instructional medium, and in part because adequate instructor support is not yet available. According to recent surveys of college instructors and corporate trainers (Bonk, 2001, 2002), the proliferation of Web courseware and training programs has yet to match the pedagogical needs of higher education and industry. When corporate respondents were asked about various intrinsic motivational techniques, activities such as job reflections, team projects, and guest mentoring were considered highly engaging and useful online. When asked about tools and activities that were more motivational for adult learners in the workplace, respondents favored Web-based learning that contained relevant materials, responsive feedback, goal-driven activities, personal growth, choice or flexibility, and interactivity and collaboration. Unfortunately, such techniques were rarely used online.

Table 1. Motivational elements addressed by different online activities

Motivational Element	Online Activity →									
	1. Ice Breakers	2. Self-Assessments	3. Surveys and Polling	4. Cases	5. Conference Tracks	6. Brainstorming	7. Electronic Guest Lectures	8. Debates and Role Play	9. Critical Friends and Peer Feedback	10. Gallery Tours
1. Tone/Climate	X					X				X
2. Feedback		X	X	X					X	X
3. Engagement	X		X	X		X		X		
4. Meaningfulness			X	X	X		X	X		X
5. Choice			X	X	X	X				
6. Variety					X	X	X			
7. Curiosity			X			X	X		X	X
8. Tension				X				X		
9. Peer Interaction	X			X	X			X	X	
10. Goal Driven		X		X	X	X		X	X	X

According to the findings of these surveys, the motivational climate of online instruction is currently deficient. Therefore, in addition to the evaluation of student learning and completion rates, organizations should step back and evaluate the motivational characteristics embedded within their courses. Of course, there also is a need for further research here since the key motivational principles for online training are only starting to emerge.

As Bonk and Dennen (in press) contend, online instruction is not a simple task; most instructors still do not understand how to adapt different technology tools to engage their students. At the same time, few designers of e-learning tools have thoroughly considered the motivational or pedagogical principles behind adult learning (Firdyiwiek, 1999; Oliver, Omari, & Herrington, 1998). How can such tools motivate adult learner participation while fostering student thinking and collaboration? And what can be done to motivate learners in online environments? These questions must be addressed in order for online education to thrive and be a positive learning experience for students.

This chapter focuses on 10 key elements for motivating online learners. Each element is discussed separately, along with corresponding course activities that can be used to address that element. Indeed, it is possible to address multiple motivational principles with one well-designed activity (see Table 1). At the same time, not every instructional situation calls for the use of each motivational element. Context-based instructional design and pedagogical decisions should always be made by the individual instructor.

Tone/Climate

The tone or climate of an online class is set at the beginning. These opening moments have the potential to engage and interest learners so that they want to be active

participants for the semester, or alternatively to isolate them and provide little motivation to participate (Salmon, 2000). Much like in the physical world, if one visits an online location and finds little reason to go back, feels uncomfortable in that place, or is uncertain of its purpose, one is not likely to participate actively in that space.

Social ice-breaking activities can be used to set the tone of an online class as well as to help learners become acquainted with one another. They also serve the purpose of familiarizing learners with the course tools without the stress of dealing with course-related subject matter. Some activities that might be employed include:

- **Two Truths and One Lie:** Everyone must post two truths and one lie about themselves. Fellow classmates then try to determine which one is the lie. This activity generates a series of messages and responses, and is a quick way to bring out learner personalities (Kulp, 1999).
- **8 Nouns:** In this activity, everyone is required to post eight nouns that describe him or herself. Near the end of this task, it becomes difficult to come up with nouns, thereby forcing participants to share a good deal of information about themselves that their peers as well as the instructor might refer to later in the course. In effect, it creates some initial shared understandings and common knowledge (Schrage, 1990).
- **Coffee House Expectations:** In this activity, students share their expectations for the class—why they enrolled and what they hope to get out of it. Not only does this activity help the instructor shape the class, it is vital for the goal-oriented behavior of adult learners. In effect, posting expectations gives adults with chaotic schedules something definitive to work toward. As an extension, students also can be asked to share what they have to offer to the class community.

These activities are often fun ways of sharing personal information. While learners may not share this much personal information at the beginning of a traditional course, in an online course it is a way of discovering student commonalities and differences. From our experience, both instructors and learners tend to refer back to the messages generated by these activities to get a better sense of who their classmates are. Using the eight nouns activity, for instance, we have had males describe themselves as “knitters,” “tea kettles,” and “dishwashers.” Such comments have made for interesting, and often humorous, social interactions in each of these courses.

Research by Dennen (2001) indicates that the instructor should model the expected responses to such activities. An instructor, for instance, might post eight nouns about himself so that learners can know him better. Just as the learners need to know who their peers are, they need to know that their instructor is more than a name.

Feedback

Feedback motivates online learners by letting them know how well their performance meets course expectations. Monitoring one’s progress toward a goal is motivational to

many students (Anderson, 2001). Whereas feedback points are typically built into all courses in the form of graded assignments, in an online class, students often feel the need for feedback at other, more formative points in time. This feedback helps them gauge their own performance and motivates them to either maintain or improve the quality of their work. Feedback may come in many forms:

- **Self-assessments:** Self-assessments can easily be built with most courseware tools, thereby allowing the technology to control the feedback.
- **Reading reactions:** Discussion activities in which learners post their reactions to course readings are useful because they allow the learners to know if they are on-track, and let the instructor know if the learners understand the material. Additionally, learners are more motivated to do the required readings if they know they must discuss them. Peer feedback opportunities can be built into such activities, making sure all learners get a response in a manner that is pedagogically beneficial, yet not labor intensive for the instructor.
- **Instructor feedback:** Feedback to instructors is also critical to online course success. Instructors, for instance, might have anonymous suggestion boxes on the Web. Watson (2000) recommends that the instructor post the suggestions as well as the corresponding decisions for learners to read. Similarly, Brown (2002) indicates that one-minute reflection and muddiest point papers using e-mail or threaded discussion forums also are highly effective in providing formative course feedback.

Engagement

Motivated learners are engaged learners. While all of the motivational methods mentioned in this chapter are in some way engaging, electronic voting and polling is one technique that can be used to engage learners at the beginning of a new unit of instruction. An instructor might survey class attitudes on an upcoming topic using a free survey tool such as Zoomerang, SurveyShare, or SurveyMonkey, and keep the results sealed until an appropriate point during the instruction. The instructor might then use the results to engage learners in a discussion of the minority point-of-view and then have learners revote or self-assess whether their attitudes have changed as a result of the discussion or additional course instruction.

Meaningfulness

Extensive research points to the importance of task meaningfulness and problem-based learning (Singer, Marx, & Krajeik, 2000; Williams, 1992). Simply put, people want to

participate in activities that they deem meaningful, authentic, and relevant (Blumenfeld et al., 1991; Savery & Duffy, 1996). In the traditional classroom, meaningfulness is important, but an instructor still can corral students to participate just because they are physically present. In contrast, in the online class, meaningfulness might make the difference between participation and non-participation.

Online activities that are meaningful to students often involve real-world scenarios and allow learners to discuss or present their own opinions and experiences relative to these scenarios. For example, students might be asked to post reflection statements that relate their job or field experiences to the concepts being learned. They also might be asked to develop written cases that exemplify a concept, and then respond to the case of a peer with a possible solution or alternative perspective (Bonk, Daytner, Daytner, Dennen, & Malikowski, 2001; Bonk, Hara, Dennen, Malikowski, & Supplee, 2000). Such meaningful and motivating activities give learners an opportunity to practice and apply what they know with peers around the globe.

Choice

Helping students make a personal investment in a course is one way of providing motivational support (Maehr, 1984). Giving learners choices allows them to be active participants and feel in control of some aspect of their learning environment (Bonk, Fischler, & Graham, 2001). It also demonstrates that the instructor is aware that the learners have entered the learning situation with their own personal goals.

Online classes can be highly designed experiences wherein learners feel they have no choice and must follow the course outline in a lockstep order. Fortunately, there are many ways in which choice may be built into an online experience. Using a motivational perspective, learners may be given the opportunity to select which discussion topics they wish to participate in. In some cases, they may even be asked to help develop the discussion topics as appropriate. Learners might also sign up for leadership roles in the weekly discussion according to personal interests and expertise (Hara, Bonk, & Angeli, 2000). Similarly, the selection of roles or personalities for online role play gives the learners a sense of control over their learning environment as well as an opportunity to be creative and spontaneous. Some classes might use a conference track approach, in which parallel sets of course requirements are proposed, each addressing a slightly different focus. Learners can then choose to fulfill the requirements that most closely match their goals or interests.

Variety

Repeating the same set of online tasks for each course activity or module will be boring for learners. Our experience indicates that learners enjoy variety in online courses—

knowing that there is something new for them to master keeps them alert and attentive as well as interested. Thus, instructors should select a range of different online activities rather than redundantly relying on the same ones.

Brainstorming is one simple activity that can interject new life and variety into a course. Learners can be asked to generate as many ideas as possible on a particular topic, without worrying about backing them up, demonstrating the applicability or practicality of the ideas, or ranking them in any way. The results of a brainstorming session might be topics or activities to be addressed or completed later in the course. Collecting multiple class responses, instead of allowing some students to dominate discussion or team projects, is another way to vary the course activities. To really make the course spontaneous, an instructor might utilize "just-in-time teaching" or a "just-in-time syllabus" (Novak, 2000). In this technique, the course skeleton is completed at the start of the semester, but can be modified in response to student interests and course performances as well as current events.

Curiosity

Learner curiosity should be cultivated in an online course, including allowing them to explore ideas beyond those expressed by the instructor. If all learners look to the instructor for answers, their curiosity can only be addressed through limited perspectives. To spark learner curiosity and bring in additional viewpoints, electronic guests may be invited into the online class for short, synchronous chat sessions, some with follow-up asynchronous discussions with those who seek further information. Along these same lines, learners may be mentored electronically by peers or practitioners to help bring in diverse perspectives.

Tension

Points of tension are points of discussion; if we all agree then we probably have little to discuss. The term "tension" frequently has negative connotations, but it can be used to generate fruitful learning discussions. Students however, may not elect to engage in tension on their own, so debates and assignments that involve role play dialogues can be particularly useful to generate tension in a manner that feels safe to students. Frequently, when students are assigned roles that promote unpopular points of view, they will preface their remarks with statements like "I was told to be the protagonist, so ..." or "As the devil's advocate here ...". Such declarations allow them to engage in the activity while distancing themselves from the viewpoints they uphold in the activity.

Peer Interaction

Peer interaction helps engage students with each other. In traditional courses, even when the instructor does not explicitly facilitate peer interaction, students tend to discuss course-related topics before or after class. In an online class, that informal peer interaction is absent since it is often self-paced or the instructor does not grasp how to facilitate it. As a result, the students may feel extremely isolated and drop the course.

Many of the techniques referenced in this chapter involve peer interaction on various levels. Discussion-based activities tend to require peer interaction in order to be successful; one-person conversations generally are not motivating. Moving beyond generic discussion, goal-oriented interactions such as collaborative problem solving activities are particularly motivating to learners because of both the peer interdependence and the ability to judge their own knowledge and skills against that of their peers (Hacker & Niederhauser, 2000). Student interaction can also be promoted through activities such as online symposia, press conferences, and expert panels. Our research indicates that these techniques are effective, since students in online classes are motivated by measures of how they are performing not only as compared to the instructor's expectations, but also as compared to classmates (Dennen, 2001).

Peer interaction may be considered a key course goal or activity. One technique found effective is the use of the critical friend activity (Bonk, Ehman, Hixon, & Yamagata-Lynch, 2002). In this activity, learners are matched or partnered to provide each other with constructive feedback on assignments. Alternatively, they might be required to send each other reminder messages of upcoming assignments and due dates. These activities may take place publicly via courseware or privately via e-mail. Peer interaction activities help ensure that students are receiving valuable feedback with a minimum of burden on the instructor.

Goal Driven

Student motivation to participate in online class activities tends to be goal driven. If the goals as presented and valued within the course structure and assessments focus on test performance, students are motivated to study for the test. Group problem-solving activities are a great way of avoiding such isolated, low-motivation scenarios. Students who have group goals or final projects to work toward will be motivated to interact with each other. Group problem-solving activities can be semester-long projects or small group-sharing activities akin to a 15-minute group brainstorm in a traditional class. And final projects might be posted online in an online gallery of student work.

Group Based vs. Self-Paced

One of the dimensions of online courses that influences an instructor's motivational options is whether or not it is possible to facilitate group interactions. Many people choose distributed learning to meet their educational needs because they desire the flexibility of working at their own pace. Working in isolation, however, can provide some motivational challenges. In part, motivation must come from within, and in part, it is affected by the design of the learning environment and activities. In group-based activities, learners often are motivated by the knowledge that peers will be reading and commenting on their contributions. However, fostering motivation for the independent learner who operates in the absence of social motivators can pose some extra challenges. Allowing for choice, variety, and independent learning styles can help in this regard, as can using active terminology such as "seek" and "explore" when describing learner tasks (Canada, 2000). Self-assessments also serve to motivate the independent learner who might be hungry for feedback.

Synchronous vs. Asynchronous Communications

Most of the activities presented here may be adapted to accommodate either synchronous or asynchronous communication technologies and may be used across disciplines. Certainly some activities seem better-suited to live interaction, whereas others might be more fruitful when learners take advantage of a lengthy time span for participation or reflection as afforded by asynchronous technologies. In addition, each activity might be varied to further motivate online learners. Table 2 presents some of the adaptations that might be made based on the differences in the communication tools.

Regardless of whether one's communication tools are synchronous or asynchronous, careful consideration should be given to the archiving of learner interactions and work. Such archives prove useful both in promoting learner reflection, as well as in enabling learners who have fallen behind to catch up. For example, a learner who has missed a guest lecture that occurred via a synchronous chat might feel disenfranchised if there were no event archive tools to replay what transpired.

Conclusion

The 10 motivational elements presented here are essential to the success of online learning environments. Online, as well as live, instructors should look for pivotal points where they can comfortably address these principles within their course design. The important point here is to focus on motivational elements and principles, not just on the

Table 2. Synchronous and asynchronous learning issues and elements within different online activities

Type of Activity	General Structure and Elements	Synchronous Issues	Asynchronous Issues
Ice Breakers	Everyone gets an opportunity to share or participate. There are a wide variety of potential activity frameworks, including Two Truths and One Lie, Coffee House Expectations, and Favorite Web Site Postings.	Turn taking is necessary since it is difficult to hear from everyone. Of course, certain activity frameworks will work better than others.	Learners may only selectively participate and read messages. Effort must be taken to encourage them to "meet" all classmates or read all messages in a new topic ice breaker.
Role Play	Learners are assigned a role or personality to play such as optimist, pessimist, journalist, coach, sage, etc. Alternatively, they might be assigned a particular person or author to assume such as Kant, Nietzsche, Mother Teresa, Sir Edmund Hillary, etc.	Learners must fully understand their roles in order to be able to play them out in real time. Some form of turn-taking must be in place to ensure that all participants are active.	Learners must have participation guidelines and deadlines to ensure that dialogue takes place. Summarization of discussion is important to bring closure, though effort must be taken to encourage learners to read the summaries.
Guest Lectures	Guests from outside of the class, such as experts in the field or authors/scholars that the students have read, are invited to join students for a discussion during a particular period of time. Typically, the guest answers learner questions, although the guest may be asked to comment on work the class has already completed.	Turn-taking must be carefully facilitated or the chat should be moderated to ensure the guest is not bombarded with too many questions at once. Preparation of questions in advance is useful.	Expectations of guest participation (how many times the guest will contribute and when) need to be clear for all participants. Early questions should be posted in advance of the guest's first interactions.
Debates	Learners may be assigned a topic and a side, either as an individual or group, and given time to research and generally prepare for the topic.	Turn-taking must be carefully facilitated to ensure equality for both sides and all members of a group.	Timing must be carefully structured to allow for dialogic interchange between sides. Rebuttals should be deeper and more reflective than in a synchronous debate and appropriate resources and references should be cited.
Peer Feedback	Learners are asked to review and comment on each other's ideas and work. Rubrics may be provided to help students focus on the appropriate criteria.	Students providing feedback must review material in advance and be prepared. Students receiving feedback benefit from the ability to seek clarification of muddly points in real time. It is important to have a way of saving feedback for later use.	Asynchronous peer feedback encourages more highly reflective feedback than synchronous feedback sessions. As a result, the timing of making the work available for critique and providing feedback is critical. The instructor may wish to

Table 2. cont.

			allow learners who receive feedback time to ask their respondents for clarification.
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range of possible tasks, since activities are simply vehicles through which effective motivation and learning can take place. In addition, the activities presented in this chapter are not intended to be exhaustive in terms of their exemplification of how to motivate online students. Instead, our intention was to provide a few useful examples and ideas that can be adopted and adapted by online instructors in higher education as well as business learning environments (for additional ideas, see Bonk & Dennen, in press). And as online motivational ideas are modified and expanded, they can now be instantaneously shared with other instructors around the globe. When that occurs, there will hopefully be fewer bored online learners and frustrated online instructors.

Acknowledgment




Portions of this chapter were presented at the 2001 and 2002 annual meetings of the Wisconsin Distance Teaching and Learning Conference, Madison, Wisconsin.

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Motivational Strategies	Can You Use? (Fill in the boxes with strategies that you could NOT Use, Might Use, or Will Definitely Use)		
Online Motivation	No Way 	Maybe 	Definitely 
1. Social Ice Breakers, Tone, Climate			
2. Feedback			
3. Engagement			
4. Meaningfulness: Relevant, Authentic			
5. Choice			
6. Variety			
7. Curiosity: Fun			
8. Tension: Challenge, Dissonance, Controversy			
9. Interactive: Collaborative, Team, Community			
10. Goal Driven: Product-Based			

CREATIVE

THINKING:

THEORY,

TECHNIQUES,

AND

ASSESSMENT

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Creative Thinking

(A Common Quote: "I'm Not Creative!!!")

a. **Creativity Definition: Young (1985):** Creativity "is the skill of bringing about something new and valuable...Creative people do more than break away from old patterns. They do more than find alternatives. They diverge from familiar patterns, but then they converge on new solutions. They break laws to remake them. They make hard decisions about what to include and what to eliminate. Creative people innovate. They aim toward newness. This can be considered in several senses:"

b. **10+ Creative Thinking Ideas:**

1. **Brainstorming** More ideas/wilder the better, no eval, combo to improve
(How to study better? How to raise test scores? What are best tchg techniques)
2. **Reverse Brainstorming**
(How to study worse? How to lower test scores? What are worst tchg techniques)
3. **Creative Writing and Story Telling**
(Object obituaries, Tell a tall tale, cartoons, jokes/quips, story starters, wrap arounds, forced responses, newsletters, object talking, etc., Golub, 1994)
4. **Idea-Spurring Questions, Checklists, or Cards** (e.g., Osborn's SCAMPER method): How do we: substitute, combine, adapt, modify/max-min, put to other uses, elim, rev/rearrange
5. **Six hats** (wear different color hats for different types of thinking)
6. **Free Writing/Wet Inking**
(write without lifting pen for 3-5 minutes on, e.g., Best teacher ever had)
7. **Checkerboarding, Attribute Listing, Morphological Synthesis**
(Analyze or combine 2 key variables/components in grid/matrix; e.g., CT & CR)
8. **Analogies, Metaphorical Thinking, Synectics, or Forced Associations**
(This school is like a ___; An good presenter is like a ___? IU hoops is like ___?)
9. **Semantic Webbing/Chaining/Linking/Mapping of Ideas, Free Association Activities**
(What is a greenhouse effect? What is a good curric? What is effective tchg?)
10. **Simulations and Role Plays**
(computer sims, act out plays or literature, simulated games or performance)
11. **Other techniques**
 - **The Second Best Answer, What else, > 1 Right Answer** (What else applies)
 - **Elaboration/Explication** (Another reason is)
 - **Diaries, Personal Journals** (When in the field, I want to jot down...)
 - **Just Suppose/What If Exercises** (What if we had cooperative exams?)
 - **Creative Dramatics/Improvisation** (imagine hearing, seeing, feeling)

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Pedagogical Strategies:

A. Creative Thinking

- 1. Brainstorm, Reverse BS: Top Ten Lists**
- 2. Simulations, Creativity License Cards, Six Hats**
- 3. Wet Inking, Freewriting, or Diaries**
- 4. Role Plays & Assigning Thinking Roles**
- 5. Forced Wrap Arounds**
- 6. Semantic Webbing or Mapping**
- 7. Idea-Spurring Questions, Think Sheets**
- 8. Metaphors, What Ifs, Analogies**
- 9. Checkerboarding, Attribute Listing**
- 10. Exploration and Web Link Suggestions**

Activities—Creativity Tasks

- 1. Metaphorical Thinking**
- 2. New Perspectives**
- 3. Webbing**
- 4. Just Suppose**
- 5. Creativity Awareness**
- 6. Creative Dramatics**
- 7. Creative Writing and Story Telling**
- 8. Wet Ink or Freewriting**
- 9. Brainstorming**
- 10. Reverse Brainstorming**

For example:

Attribute Listing, Modification, and Transformation (Davis pp. 178-186)

- Attribute Webbing/Listing: "XYZ" shapes, colors, sizes, purpose, numbering.
- Attribute Modification: "XYZ"--after listing attributes, think of ways to improve each.
- Alternative Uses: Uses for "XYZ" for this class or for teaching in general.
(find the second best or third best suggestion)
- Attribute Transferring: "XYZ"--transfer ideas from one context to the next.
(with idea spurring questions--p. 80; Davis 184-186)
(What else is this like? What have others done? What else is this like? What could we copy? What has worked before?)
(What can we borrow from a carnival, funeral parlor, track meet, wild west)
- Idea Spurring Questions: how MAXimize, MAGnify, arrangeRE, combine-adapt, subtutesti,
EEEXXAAGGGGGEEERRRAAATTTEEE. *add new twist, modifie, ChAnGe*

Rearrange facts/what if (**Pick one** and write for a minute):

1. What-if no one studied creativity and we had no understanding of creative processes?
2. What-if no one assessed creativity? There were no cr measures or researchers?
3. Just suppose you were in charge of curriculum? How would you address cr?
4. What if we had standardized creativity or coop. learning tests in Indiana?
5. What-if creative thinking was more prevalent in dogs than human beings?
6. If people didn't need to sleep, would we be more creative in morning or at night?
7. Suppose the Japanese were well known for creativity and creativity assessment?
8. What-if more creative people lived 20 years longer than non less creative?
9. What-if in 20 years, creativity became equated with intelligence?
10. What would teaching creative thinking be like if we lived life in reverse...???
11. Just suppose Indiana assessed the level of dept. thoughtfulness? Would tchg be different?

Which items would you like on your teacher report card?

12. Just suppose teachers were asked to assess the level of student thinking?
Select questions that could be added to a student report card.
What would teaching be like? What would learning be like?

Flexibility/Breaking Set Activity

a. New Perspectives, Metaphoric Thkg, Analogies, Synectics, Breaking Set, Imagery, Aesthetics,

Finding New Patterns, Juxtaposing Ideas, Seeing Functional Fixity, etc...

(See: Word games; Which one is different; Nine dots; Flying Pig; Davis pp. 125 & 133); Synectics: Direct, Personal, and Fantasy Analogies; Concealed colors, sentences/words; 13 original colonies

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The Creative Insights of Heraclitus (as interpreted by Von Oech) (2002)

1. The cosmos speaks in patterns.
2. Expect the Unexpected, or you won't find it.
3. Everything flows.
4. You can't step in the same river twice.
5. That which opposes produces benefit.
6. A wonderful harmony is created when we join together the seemingly unconnected.
7. If all things turned to smoke, the nose would become the discerning organ.
8. The Sun will not exceed its limits, because the avenging Furies, ministers of Justice, would find out.
9. Lovers of wisdom must open their minds to very many things.
10. I searched into myself.
11. Knowing many things doesn't teach insight.
12. Many fail to grasp what's right in the palm of their hand.
13. When there is no sun, we can see the evening stars.
14. The most beautiful order is a heap of sweepings piled up at random.
15. Things love to conceal their true nature.
16. Those who approach life like a child playing a game, moving and pushing pieces, possess the power of kings.
17. Sea water is both pure and polluted: for fish it is drinkable and life-giving; for humans undrinkable and destructive.
18. On a circle, an end point can also be a beginning point.
19. It is disease that makes health pleasant. hunger that makes fullness good. and weariness that makes rest sweet.
20. The doctor inflicts pain to cure suffering.
21. The way up and the way down are one and the same.
22. A thing rests by changing.
23. The barley-wine drink falls apart unless it is stirred.
24. While we're awake, we share one universe. but in sleep we each turn away to a world of our own.
25. Dogs bark at what they don't understand.
26. Donkeys prefer garbage to gold.
27. Every walking animal is driven to its purpose with a whack.
28. There is a greater need to extinguish arrogance than a blazing fire.
29. Your character is your destiny.
30. The sun is new each day.

How can we Kill children's Creativity?

- 1. Surveillance:** Hovering over kids, making them feel that they're constantly being watched/under constant observation while they are working, the new ideas hardly appear from their mind.
- 2. Evaluation:** When we constantly make kids worry about how they are doing, they ignore satisfaction with their accomplishments.
- 3. Rewards:** The excessive use of prizes deprives a child of the intrinsic pleasure of creative activity.
- 4. Competition:** Putting kids in a win-lose situation, where only one person can come out on top results in negating the process children progress at their own rates.
- 5. Exceeding control:** Constantly telling kid how to do things right makes children feel their originality as a mistake and think any exploration as a waste of time.
- 6. Restricting choice:** Telling children which activities they should engage in instead of letting them follow where their curiosity and passion doesn't lead to creative discovery and production.
- 7. Pressure:** Establishing unreasonably high expectations for a child's performance often ends up instilling aversion for a subject or activity. They often pressure children to perform and conform within strictly prescribed guidelines so as to deter experimentation, exploration, and innovation. They are often beyond children's developmental capabilities.

* This was adapted from a book,

Goleman, D., Kaufman, P., & Ray, M. (1992). *The creative spirit*. NY: Penguin Books.

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Ten Creative Ways to Teach Math (Lena Lee, Ph.D., 2007)

Here are some activities for your classroom to add a bit of sparkle and creativity. As children work, ask critical questions such as "Did you try this?" "What would have happened if?" "Do you think you could?" to enhance children's understanding of mathematical ideas and vocabulary.

1. **Use dramatizations**. Invite children pretend to be in a ball (sphere) or box (rectangular prism), feeling the faces, edges, and corners and to dramatize simple arithmetic problems such as: Three frogs jumped in the pond, then one more, how many are there in all?
2. **Use children's bodies**. Suggest that children show how many feet, mouths, and so on they have. When asked to show their "three arms," they respond loudly in protest, and then tell the adult how many they do have and show ("prove") it. Then invite children to show numbers with fingers, starting with the familiar, "How old are you?" to showing numbers you say, to showing numbers in different ways (for example, five as three on one hand and two on the other).
3. **Use children's play**. Engage children in block play that allows them to do mathematics in numerous ways, including sorting, seriating, creating symmetric designs and buildings, making patterns, and so forth. Then introduce a game of Dinosaur Shop. Suggest that children pretend to buy and sell toy dinosaurs or other small objects, learning counting, arithmetic, and money concepts.
4. **Use children's toys**. Encourage children to use "scenes" and toys to act out situations such as three cars on the road, or, later in the year, two monkeys in the trees and two on the ground.
5. **Use children's stories**. Share books with children that address mathematics but are also good stories. Later, help children see mathematics in any book. In *Blueberries for Sal*, by Robert McCloskey (Penguin, 1993; \$9.99), children can copy "kuplink, kuplank, kuplunk!" and later tell you the number as you slowly drop up to four counters into a coffee can.
6. **Use children's natural creativity**. Children's ideas about mathematics should be discussed with all children. Here's a "mathematical conversation" between two boys, each 6 years of age: "Think of the biggest number you can. Now add five. Then, imagine if you had that many cupcakes." "Wow, that's five more than the biggest number you could come up with!"
7. **Use children's problem-solving abilities**. Ask children to describe how they would figure out problems such as getting just enough scissors for their table or how many snacks they would need if a guest were joining the group. Encourage them to use their own fingers or manipulatives or whatever else might be handy for problem solving.
8. **Use a variety of strategies**. Bring mathematics everywhere you go in your classroom, from counting children at morning meeting to setting the table, to asking children to clean up a given number or shape of items. Also, use a research-based curriculum to incorporate a sequenced series of learning activities into your program.
9. **Use technology**. Try digital cameras to record children's mathematical work, in their play and in planned activities, and then use the photographs to aid discussions and reflections with children, curriculum planning, and communication with parents. Use computers wisely to mathematize situations and provide individualized instruction.
10. **Use assessments to measure children's mathematics learning**. Use observations, discussions with children, and small-group activities to learn about children's mathematical thinking and to make informed decisions about what each child might be able to learn from future experiences. Also try computer assessments. Use programs that assess children automatically.

Adapted from the Building Blocks project's DLM Early Childhood Express Math; Clements & Sarama, 2003; Schiller, Clements, Sarama, & Lara-Alecio, 2003

TOP TEN TIPS: A SURVIVAL KIT FOR STUDENT WRITERS
By Scott Lankford (Professor of English, Foothill College)

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CREATING CREATIVITY: The Top Ten Ways to Add "Spice" to Your Writing

A good cook adds a subtle combination of spices to bring out the flavor in foods. The same is true in writing -- except that in writing the "spice" is food for thought. To provide that extra pinch of creativity to any essay you might add:

1. **Six-Senses Descriptions**
What do you see, hear, smell, taste, touch, and feel?
2. **Time-Travel Flashbacks**
Jump back in time to the most dramatic, most memorable moment.
3. **Slow Motion/ Zoom In**
Slow down time to a crawl. Describe one minute, one second, one moment in delicious detail, like a slow-motion movie. Tiny, telling details create unforgettable images.
4. **Comparisons/Contrast**
What is your subject "like"? What is your subject unlike? Like sweet and sour in cooking (or in love), opposites attract--and explode with fresh flavor and energy.
5. **Show Don't Tell**
Instead of writing "I was angry" or "She felt sad," think what actions or words or gestures could you use to show - literally to "act out" - the essence of an emotion or idea. How can you "show" the reader what you mean without "telling" them directly?
6. **Humor**
Even serious situations have hidden humor. Just be sure to laugh with people, not at them. Used wisely, humor is the most efficient way to use (not lose) an audience.
7. **Quotes, Dialogue, and Slang**
Use famous quotes, dialog, slang, foreign phrases, and technical terms to add creative zest to your descriptions.
8. **Suspense**
Tease, taunt, and tantalize your reader with hints and cliffhangers. Let every page leave them begging for more.
9. **Point of View**
Nothing to say? Change perspectives: use You, He, She, We, or They instead of I.
10. **Imagine That**
Ask your reader to imagine a perfect world in which the issues you describe no longer exist—or a nightmare world where those same problems have expanded!

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January 17, 2005

Measuring Literacy in a World Gone Digital

By TOM ZELLER Jr.

There was a time when researching a high school or college term paper was a far simpler thing. A student writing about, say, Count Ferdinand von Zeppelin, might have checked out a book on the history of aviation from the local library or tucked into the family's dog-eared Britannica. An ambitious college freshman might have augmented the research by looking up some old newspaper clips on microfilm or picking up a monograph in the stacks.

Today, in a matter of minutes, students can identify these and thousands of other potential resources on the Internet - and, as any teacher will attest, they are not always adept at sorting the wheat from the chaff.

Now the Educational Testing Service, the nonprofit group behind the SAT, Graduate Record Examination and other college tests, has developed a new test that it says can assess students' ability to make good critical evaluations of the vast amount of material available to them.

The Information and Communications Technology literacy assessment, which will be introduced at about two dozen colleges and universities later this month, is intended to measure students' ability to manage exercises like sorting e-mail messages or manipulating tables and charts, and to assess how well they organize and interpret information from many sources and in myriad forms. About 10,000 undergraduates at schools from the University of California, Los Angeles to Bronx Community College are expected to take the test during the first offering period, which ends March 31.

Still, just what is meant by "information" or even "technological" literacy remains a hotly debated topic in academic circles, and there is no widespread agreement on whether such skills can be taught, much less measured in a test. What seems certain, however, is that a lucrative market is emerging for testing companies that are willing to fill the perceived need.

The initial technology test is aimed at midlevel college students, but the Educational Testing Service says it has also received inquiries from high schools and businesses. And while the new assessment is not a high-stakes requirement for academic advancement like the SAT, it seems inevitable that most students will one day need to prove themselves along these lines.

Part of the problem, many educators say, is that the traditional vetting process for information is now so easily bypassed.

"In an earlier time, information came, really, from only one place: the university library," said Lorie Roth, the assistant vice chancellor of academic programs for the California State University system, one of seven school systems that worked with the testing company over the last two years to develop the test. "Now it is all part of one giant continuum, and often the student is the sole arbiter of what is good information, what is bad information and what all the shades are in between."

But not everyone agrees that measuring information literacy can be done, even with a standardized test.

"There is a basic problem with identifying a single set of skills that could possibly relate to all people," said Stanley Wilder, the associate dean of the River Campus Libraries at the University of Rochester in New York, who wrote a withering assessment of the information literacy movement in *The Chronicle of Higher Education* two weeks ago. "There isn't a serious critique of any of the assumptions that info-literacy makes," Mr. Wilder said in an interview. "They'll tell you that it teaches critical thinking, but there's never been a study that measures whether students are really lacking this, or whether libraries can impact this."

Be that as it may, it is true that the information literacy movement could prove a windfall for companies like the Educational Testing Service.

Developing metrics for measuring how much students know - or how much they have yet to learn - has become a lucrative market. Eduventures, a research firm in Boston, estimated the assessment market for prekindergarten to Grade 12 - excluding the college years and beyond - at \$1.8 billion for 2003. Given President Bush's announcement last Wednesday that he plans to expand the standardized testing mandated under the No Child Left Behind Act - which includes a commitment to "ensuring that every student is technologically literate by the time the student finishes the eighth grade" - the market for assessments is certain to grow.

Beyond the SAT, the Educational Testing Service controls a separate boutique market of higher-level tests like the Graduate Record Examination and the Graduate Management Admission Test. Despite its nonprofit status, it is the world's largest private educational testing and measurement organization. The company administers and scores nearly 25 million tests annually in more than 180 countries, and posted \$825 million in revenues for fiscal year 2004.

In an extensive report, "Tech Tonic: Towards a New Literacy of Technology," published in September, the Alliance for Childhood, a nonprofit group that is often skeptical of technology in schools, was critical of the new test. "For E.T.S., this is part of a broader global plan to develop and promote international technology literacy standards, and then offer countries around the world a chance to buy a full array of assessment products and services that can be used to implement their standards," the report said.

But if critics see this as an unjustified entry into an already littered field of standardized tests, the company argues that the information age - and a new culture of accountability - demand it.

"I think there's always that tension," said Teresa Egan, the project manager who is steering the test's release at the end of this month. "People feel there's too much testing across the board now. Or they ask whether we are focusing so much time on testing that students don't have time for other educational experiences.

"But the public wants accountability. People want to ensure that colleges are actually preparing students for the future - the future being an information society." The technology test will cost colleges around \$25 a student - discounted to \$20 for institutions that sign up during the first testing period. Students will take the Web-based exam in classrooms or instruction labs, logging on with access codes purchased by their schools. Scores in the first round will be aggregated for each institution; the company aims to make scoring for individual students available in 2006.

In 2001, the testing company brought together an international consortium of educators, technology specialists and government representatives to begin defining the core characteristics of information consumption at the college level.

Knowing where and how to find information, they agreed, was just the beginning. Interpreting, sorting, evaluating, manipulating and repackaging information in dozens of forms from thousands of sources - as well as having a fundamental understanding of the legal and ethical uses of digital materials - are also important

components.

"Critical thinking is a central aspect of the new economy," said Robert B. Reich, the secretary of labor in the Clinton administration, who is now a professor of social and economic policy at Brandeis University. Professor Reich is also the author of the 1991 book "Work of Nations: Preparing Ourselves for 21st Century Capitalism," which provided a something of a touchstone for the information literacy movement. "Our high school curricula are locked into an industrial age that may have only a tangential relationship to the information age," he said in an interview.

To the extent that efforts like the new technology test help reshape curriculums along these lines, Mr. Reich said, they probably will help.

According to Ms. Egan of the Educational Testing Service, the test is also fun.

"Can you help me find a good source of products and gifts designed for left-handers?" reads a sample question from a fictitious office manager. "I'd like someplace that offers a wide range of merchandise with product guarantees - also that has an online catalog and online ordering. Discounts would also be a plus."

Fictitious colleagues might then make suggestions via e-mail, and the test taker might also get input by instant message from people using screen names like SkyDiver, JJJunior and TVJunkie. The test taker would be asked to consider the various sources and suggestions, and to rank them by relevance to the original request.

Other parts of the test ask students to do everything from the seemingly mundane (like sorting e-mail messages into appropriate folders) to head-scratching tasks like "reordering a table to maximize efficiency in two tasks with incompatible requirements," according to a brochure.

Asked if she had taken the test herself, Ms. Egan responded, "What a cruel question.

"I took it earlier on, when there was no way to produce a score from it. But I knew myself that there was a lot I needed to learn."

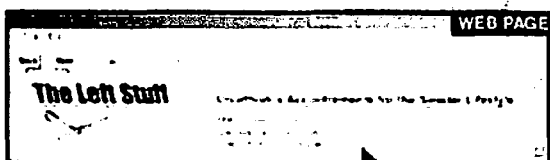
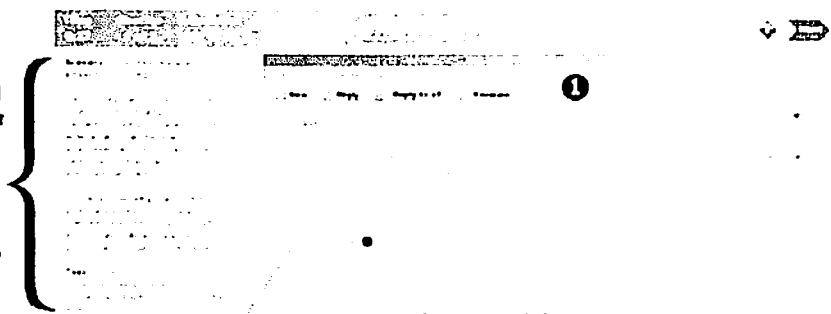
Testing Your Cybersmarts

The Educational Testing Service, which also administers the SAT, has developed the Information and Communications Technology test to gauge a student's ability to navigate digital information from a variety of sources. Here is one sample from the test:

The problem: Comparing information

The examinee works for an architectural firm and is asked to find a source of products for its many left-handed architects.

SEARCH CRITERIA
Wide range of products with product guarantees, an online catalog and online ordering discounts.



1 Examining the sources

The examinee receives three e-mail messages from potential sources. The examinee must go through the e-mail to identify and gather the necessary information.

THE E MAIL MESSAGES
One has a link to a Web page, one has an attached advertisement and the other is a detailed message.

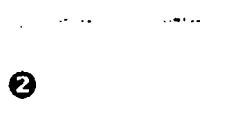
Source: Educational Testing Service

TABLE

Source	Product	Price
Source 1	Product 1	Price 1
Source 2	Product 2	Price 2
Source 3	Product 3	Price 3

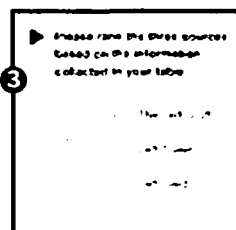
2 Summarizing the data

After gathering the data, the examinee is presented with a table that includes the three sources, and must select the appropriate fields for comparison.



3 Ranking the sources

After completing the table, the examinee must interpret the results and rank the three sources correctly.



Close Window

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The New York Times

Horse or Frog ?

Turn the picture sideways and you decide.

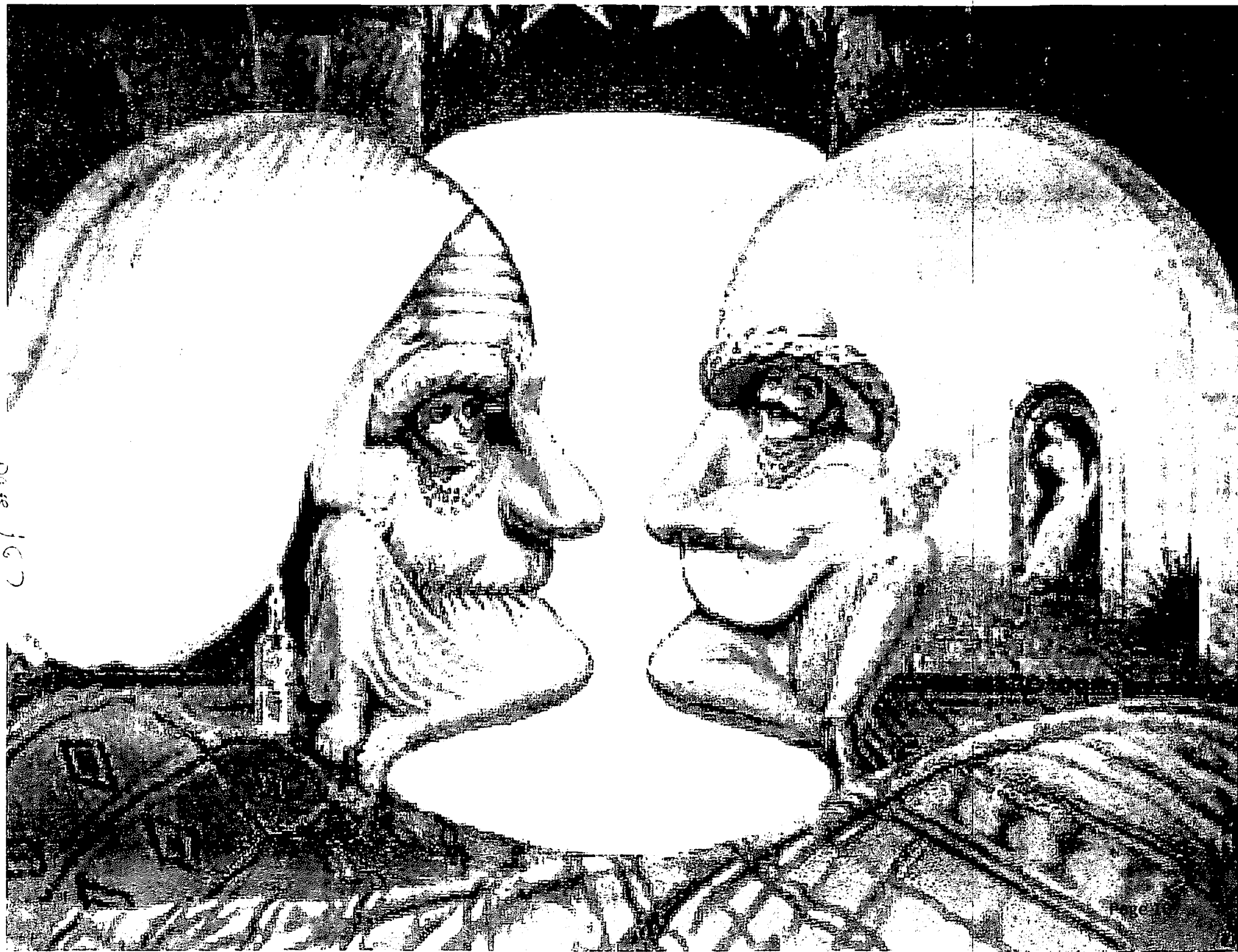


Ancient Japanese Proverb

木は右に傾くは
人の心を傾くは

If you cannot understand Japanese,
tilt your head to the right.

page 166



Page 167

25 Creative Thinking Techniques:

Visual Thinking Activities:

1. Perceptual Exercises and Visual Demonstrations
Figure-Ground, Hidden Figures, playful perception
2. Imagery, Guided Visualization, Fantasizing, Daydreaming
Finding muse, insights, overcoming emotional blocks, mental image
3. Metaphoric Thinking, Similes, and Forced Associations
Life like a ___ ? School like a ___ ?
4. Synectics and Analogical Thinking
Figural, Direct, Personal, Fantasy, Compressed Conflict/Oxymorons
5. Breaking Set and Finding New Patterns
Break out of functional fixity, Make familiar strange

Idea Listing Activities:

6. Attribute Listing (problem or product is divided into key attributes addressed separately)
(also referred to as Checkerboarding and Jot Charting)
Modifying--list main attributes of a problem object and think of ways to improve.
Transferring--borrowing attributes or ideas from another place; analogical thinking.
7. Morphological Synthesis (combine two attributes in the form of a grid)
8. The Second Best Answer, > 1 Right Answer, What else, Elaboration/Explication
9. Idea Spurring Checklists and Cards; e.g., Osborn's SCAMPER method:
substitute, combine, adapt, modify/max-min, put to other uses, elim, rev/rearrange
10. Just Suppose/What If?/Rearrange Facts/Reorganize Information

Writing Activities:

11. Semantic Webbing/Chaining/Linking/Mapping
12. Free Writing/Wet Ink
13. Reflection Writing: Diaries, Personal Journals
14. Creative Writing
Newsletters, Cartoons, Quips, Riddles, Jokes, Humor, Stories, Books, Twisted Fairy Tales, Object Talking, Telling Lies, Third Eye, Object Obituaries, Telling Tall Tales
15. Sentence Stems/Story Starters/Openers/Warm-up (e.g., Another reason is, In contrast to)

Group Interaction Activities:

16. Simulations/Role Plays/Sociodramas/Mock Trials/Show & Tell
17. Creative Dramatics/Improvisation/Pantomime
Movement, imagine, hear, touch, smell, tastes...
Hold up roof, biggest thing, stretching, mirrors, toe tips, people machines, puppets
18. Fish Bowl
19. Six Hats (an example of Lateral Thinking)
20. Nominal Group Process, Brainstorming, Reverse Brainstorming
More ideas/wilder the better, hitchhiking encouraged, no eval, combo to improve

Process-Product Oriented Activities:

21. Problem Finding and Defining
22. Future Problem Solving, Odyssey of the Mind, and Science Olympiad
Multistep probs, unknowns, decisions, teams, communicate, self-directed, ambiguity
23. Creativity by Design/Problem-Based Learning/Make a Creative Product/Inventing
Use design q's, possib/ideas b/4 commitments/details, explore models, think on paper
Good results, easy to use, safe, durable, attractive, comfortable, reasonable cost
24. Creative Problem Solving, Guided Design, AUTA, Incubation Model,
25. Model Building

Young (1985): Creativity (p. 78) "is the skill of bringing about something new and valuable."

p. 82 "Creative people do more than break away from old patterns. They do more than find alternatives. They diverge from familiar patterns, but then they converge on new solutions. They break laws to remake them. They make hard decisions about what to include and what to eliminate. Creative people innovate. They aim toward newness. This can be considered in several senses:"

Six General Principles of Creativity (Perkins, 1984)

1. Involves aesthetic (i.e., original, powerful, fundamental) as much as practical thinking.
2. Depends on attention to purpose (i.e., structure, standards, goals) as much as to results.
3. Depends on mobility (i.e., flexibility, divergency, revision) more than fluency.
4. Depends on working at the edge (i.e., challenge) more than at the center of competence.
5. Depends as much on being subjective as on being objective.
6. Depends on intrinsic, more than extrinsic, motivation.

(Schools shun aesthetics, purpose, mobility/divergency, challenge, multiple viewpoints, internal motivation)

Overview of Perkins Smart Schools (1992) (Chapters 1-6)

1. Inert, unconnected knowledge is inferior to classroom emphasizing higher-order thinking.
2. Need effort-related definition of intelligence not single entity
3. Cultural and classroom expectations impact on effort.
4. There are multiple theories of learning and multiple ways to teach; pick a good one(s).
5. There are many ways to teach for understanding and to test student understanding.
6. Meta-awareness of our understanding is of primary importance in the metacurriculum.
7. There are a # of overlapping trends in education: whole language, concept mapping, etc.
8. Dispositions of good thkg (e.g., broad, adventurous, curious, plan, strategic, eval) are impt.
9. Transfer is not automatic; need a good shepard or bridging/scaffolding learning.
10. Good classroom learning results from realizing the distributed nature of intelligence.

Roger von Oech from A Whack in the Side of the Head (1983):

Soft Thinking: metaphor, dream, play, child, hunch, ambiguous, fantasy, approximate, humor.

Hard Thinking: logic, reason, work, adult, analysis, consistency, reality, exact, precision.

Whack in the Head Tips:

1. Challenge the rules and play the revolutionary.
2. #1 has its dangers.
3. Periodically inspect your ideas to see if they help your thinking.
4. Avoid falling in love with ideas.
5. Hold rule inspecting and rule discarding sessions in your organization.
6. Take advantage of ambiguity and think of how else you might use something.
7. Cultivate your personal resources so as to look for more than 1 meaning.
8. Write an ambiguous job description for yourself.
9. If you make an error, use it as a stepping stone to a new idea.
10. Strengthen your risk muscle at least once every 24 hours.

p. 65 "TIP: For more effective thinking, rotate your ideas every 10,000 thoughts. Creativity involves not only generating new ideas, but escaping from obsolete ones as well."

Davis (1992) Principles of Creativity:

1. Creativity is not just for artists, inventors, scientists.
2. Creativity is a way of thinking and living.
3. Creative people are "creatively conscious."
4. Creative people see things from different viewpoints.
5. Creative people do not grab the first idea that comes along.
6. Creative people are willing to take some risks and fail.
7. Creative people are aware of conformity pressure and are not afraid to be different.
8. Creative people play with ideas and act like a child and think up "wild" possibilities.
9. Creativity is not mysterious; it is the modification of an old idea or new combo of old.
10. Creative people use special techniques and talents to find new idea combinations.

Creativity Research.

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information	activities	research	education
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What is creativity?

Creativity is defined as the interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context (Plucker, Beghetto, Dow, 2004). The perceptual product can be an object such as a painting, book, or drawing, or it can be an intangible object such as an idea, or new way of doing something. The concept of "novel" refers to the statistical infrequency within the population and the useful refers to the value that society places on the product.

Can anyone be creative?

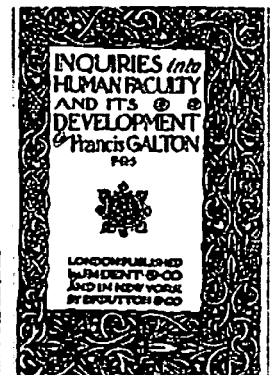
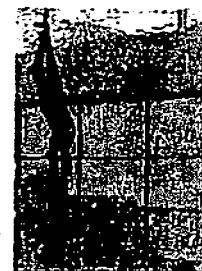
The distinction between creativity, as defined above, and everyday creativity is often referred to as big "C" little "c" creativity (Gardner, 1993). Big "C" creativity has global significant and is valuable to society, whereas little "c" creativity has personal value to either an individual or a few others.

Examples of a big "C" creativity include the invention of the automobile, the Mona Lisa, and the internet. Examples of little "c" creativity include your child's kindergarten painting, your high school poem that was never published, the novel way you get your child to brush his or her teeth. Sometimes little "c" creativity can evolve into big "C" creativity.

History of Creativity

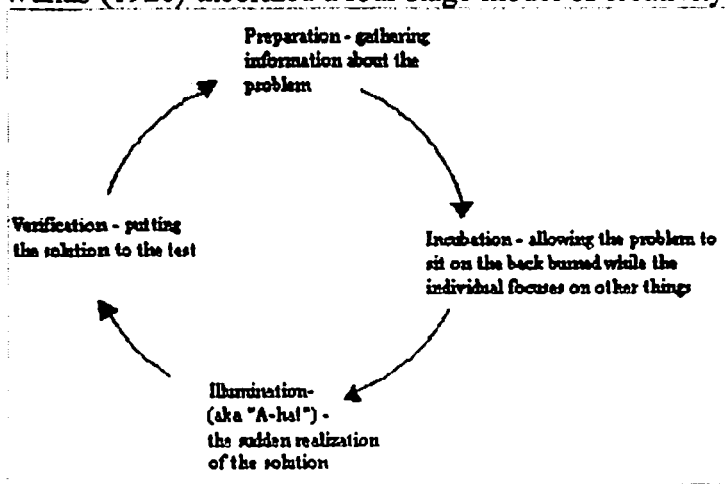
The methodological inquiry into human creativity stems from early research into intelligence, most notably Galton's seminal publication entitled *Inquires into Human Faculty*, 1883. In this book Galton explored the nature of intelligence and creativity as determined by imagination.

Following Galton, additional intelligence researchers, most notably, Kohler (1927) studied problem solving among chimpanzees. While stranded on an island due to the war he began studying army chimpanzees. His famous work with Sultan was on problem solving. Kohler noticed that when Sultan, while trying to obtain bananas suspended overhead, out of reach, he sat down and appeared to think, he then suddenly jumped up and retrieved some crates to stack them in order to reach the bananas. Kohler termed this problem solving



"insight" Insight is defined as the sudden realization of the correct solution, often as a result of taking a novel approach.

Wallas (1926) theorized a four stage model of creativity. The first stage, **preparation**, the individual gathers information about the problem he or she is attempting to solve. The more information obtained the higher the chances are that you will solve the problem



In the second state, **incubation**, the individual puts aside the problem and works on other projects. This is the point at which the subconscious mind continues to work on the problem.

Stage three **illumination** (also known as "A-ha!") is the sudden realization of the correct solution.

The final stage four, **verification**, consists of the individual returning to the problem to determine if the solution is acceptable. If the solution is not acceptable then individual returns to the initial stage of preparation and gathers additional information (including the failed solution)

In 1950, Guilford, who is considered the father of creativity, spearheaded a campaign to revive the dying field of creativity inquiry in his Presidential address given at the American Psychological Association. His speech sparked new interest in the once fading field and led to a flurry of interest in creativity and the desire to disentangle creativity intelligence. Guilford arguing against the prevailing, contemporary theories about a single, general intelligence presented compelling evidence for distinct components of intelligence in his famous Structure of Intelligence (SOI) model. The SOI model is a comprehensive theoretical framework of over 100 components of human intelligence which includes those pertaining to creativity. Within this model lies convergent and divergent thinking.

Gayle's Gazette .50 ¢

June 1950

EXTRA EXTRA! Read all about it!

Man gives birth to Creativity

Guilford named as baby's father. J.P. Guilford was on hand for the American Psychological Association Conference in 1950, Guilford, who is considered the father of creativity, spearheaded a campaign to revive the dying field of creativity inquiry in his Presidential address given at the American Psychological Association.

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Convergent thinking is the process toward obtaining a single, successful solution. For example, a math problem such as 33×14 yields a single correct solution.

Divergent thinking is the process of finding many, successful solutions. Divergent thinking typically occurs when individuals are attempting to solve a problem that has no unique solution, or are presented with a novel problem situation when a solution has not yet been discovered.

In contrast, convergent thinking occurs when thought is directed towards one correct and socially accepted solution. Creative problem solving involves both convergent and divergent thinking. First divergent thinking is employed to generate a diverse assortment of possible solutions to a problem, then convergent thinking to narrow down the multiple possibilities to converge on a single best solution to successfully solve the problem.

As a result of Guilford's efforts, research into creativity grew as others sought to further isolate creativity from intelligence and to develop approaches to measure creativity to determine the

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successfully solve the problem. As a result of Guilford's efforts, research into creativity grew as others sought to further isolate creativity from intelligence and to develop approaches to measure creativity to determine the factors that influence creativity.

How to researchers measure creativity?

There are many tests that have been devised to measure creativity. Unfortunately not everyone has agreed upon the same definition, so the tests can be very different.

Creativity, traditionally, is measured with four components.

1. Originality = infrequency of response, product, or idea
2. Fluency = number of responses,
3. Flexibility = the degree of difference of the responses, in other words do they come from a single
4. Elaboration = the amount of detail

Creativity Tests

The Unusual Uses Test (Guilford, Merrifield, & Wilson, 1958) is a test of divergent thinking in which individuals are asked to give as many substitute uses for common items, such as a brick or paperclip, newspaper, etc).

Responses for the brick example range from not very original "use as a door stop" to very original "a child uses it as a mock coffin at a Barbie funeral".

Another, and perhaps the most popular, assessment of creativity is the Torrance Tests of Creative Thinking (Torrance, 1974). This assessment presents the test taker with an abstract figure (such as three wavy, parallel lines) and asks "list all the things this figure could be" the student might then respond with "a river, ocean waves, dancing snakes" etc. Scoring for divergent thinking tests typically address fluency (number of responses), originality (rarity of responses), flexibility (the variety of responses), and elaboration (amount of detail in the response)

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Creativity Research.

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<u>information</u>	<u>activities</u>	<u>research</u>	<u>education</u>
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Books on Creativity

Cracking Creativity: The Secrets of Creative Genius by Michael Michalko ISBN: 1580083110

Creative Intelligence: Toward Theoretic Integration by Donald Ambrose and Mark A. Runco ISBN: 1572734663

Creative Whack Pack by Roger Von Oech ISBN: 0880793589

Creativity : Flow and the Psychology of Discovery and Invention by Mihaly Csikszentmihalyi ISBN: 0060928204

The Creativity Research Handbook, Vol. 1 and 2 edited by Mark A. Runco

Creativity and Affect by Melvin P. Shaw, Mark A. Runco ISBN: 1567500129

Creativity as an Educational Objective for Disadvantaged Students by Mark A. Runco ISBN: 0788104403

Divergent Thinking by Mark A. Runco ISBN: 0893917001

Eminent Creativity, Everyday Creativity, and Health by Mark A. Runco, Russell Eisenman, Ruth Richards, Albert Rothenberg, Arnold M. Ludwig ISBN: 1567501745

Encyclopedia of Creativity Vol 1 and 2 by Steven Pritzker and Mark Runco (Eds) ISBN: 0122270754

Expect the Unexpected or You Won't Find It: A Creativity Tool Based on the Ancient Wisdom of Heraclitus by Roger Von Oech and George Willet ISBN: 1576752275

Flow: The Psychology of Optimal Experience by Mihaly Csikszentmihalyi ISBN: 0060920432

Handbook of Creativity by Robert J. Sternberg (Editor) (Paperback) ISBN: 0521576040

A Kick in the Seat of the Pants: Using Your Explorer, Artist, Judge, & Warrior to Be More Creative by Roger Von Oech ISBN: 0060960248

Thinkertoys: A Handbook of Business Creativity by Michael Michalko ISBN: 0898154081

A Whack on the Side of the Head: How You Can Be More Creative by Roger Von Oech and George Willet ISBN: 0060960248

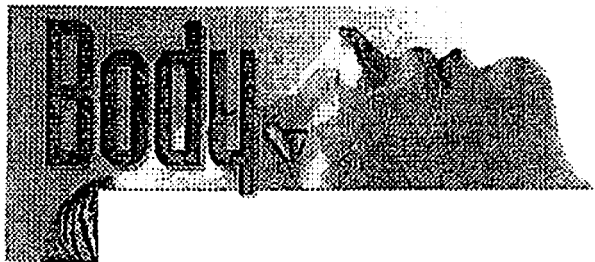
0446674559

Journals in the Field

Creativity Research Journal Editor Mark A. Runco ISBN: 0805899308

Journal of Creativity Behavior Editor Thomas B. Ward

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THE ART OF GENIUS

Eight Ways to Think Like Einstein

The Bright Idea

Thinking Like a Genius



How do geniuses come up with ideas? What links the thinking style that produced Mona Lisa with the one that spawned the theory of relativity? What can we learn from the thinking strategies of the Galileos, Edisons, and Mozarts of history?

For years, scholars tried to study genius by analyzing statistics. In 1904, Havelock Ellis noted that most geniuses were fathered by men older than 30, had mothers younger than 25, and usually were sickly children. Other researchers reported that many were celibate (Descartes), fatherless (Dickens), or motherless (Darwin). In the end, the data illuminated nothing.

The Art of Genius

Academics also tried to measure the links between intelligence and genius. But they found that run-of-the-mill physicists had IQs much higher than Nobel Prize-winner and extraordinary genius Richard Feynman, whose IQ was a merely respectable 122. Genius is not about scoring 1600 on your SATs, mastering 14 languages at the age of 7, or even being especially smart. As psychologist Joy P. Guilford and others have demonstrated, creativity is not the same as intelligence.

Mind and Matter

The Genius and the Nut

Most people of average intelligence can figure out the expected conventional response to a given problem. For example, when asked "What is one-half of 13?" most of us immediately answer six and one-half. That's because we tend to think reproductively. When confronted with a problem, we sift through what we've been taught and what has worked for us in the past, select the most promising approach, and work within a clearly defined direction toward the solution.

Brain Stretch



Geniuses, on the other hand, think productively. They ask "How many different ways can I look at this problem?" and "How many

ways can I solve it?" A productive thinker, for example, would find a number of ways to "halve 13":

6.5

1|3 = 1 and 3

THIR TEEN = 4

XI|II = 11 and 2

XIII = 8

The mark of genius is the willingness to explore all the alternatives, not just the most likely solution. Asked to describe the difference between himself and an average person, Albert Einstein explained that the average person faced with the problem of finding a needle in a haystack would stop when he or she located a needle. But Einstein would tear through the entire haystack looking for all possible needles.

Reproductive thinking fosters rigidity. This is why we so often fail when we're confronted with a new problem that appears on the surface to be similar to others we've solved, but is, in fact, significantly different in its deep structure. Interpreting such a problem through the prism of past experience will inevitably lead you astray. If you think the way you've always thought, you'll get what you've always gotten.

For centuries the Swiss dominated the watch industry. But in 1968, when a U.S. inventor unveiled a battery-powered watch with no bearings or mainspring at the World Watch Congress, every Swiss watch manufacturer rejected it because it didn't fit their limited paradigm. Meanwhile, Seiko, a Japanese electronics company, took one look at the invention and proceeded to change the future of the world watch market.

Biologists have long known that a gene pool lacking in variation will sooner or later be unable to adapt to changing circumstances. In time, the genetically encoded wisdom will convert to foolishness, with consequences fatal to the species. Similarly, we all have a rich repertoire of ideas and concepts based on past experiences that enable us to survive and prosper. But without any provision for variation, they become stagnant and ineffectual.

When Charles Darwin returned to England after his famous trip to the Galapagos Islands, he showed the finch specimens he found there to distinguished zoologist John Gould. But Gould didn't know how to interpret them. Thinking the way he had been conditioned to think, he assumed that, since God made one set of birds when he created the world, the specimens from different locations would be identical.

As a result, he thought Darwin's finches, which looked quite different from the English variety, represented a distinct species -- and missed the textbook case of evolution right in front of him. As it turned out, Darwin didn't even know the birds were finches, but because of his unorthodox way of thinking, he came up with an idea that would reshape the way we see the world.

By studying the notebooks, correspondence, and conversations of some of the world's great thinkers in science, art, and industry, scholars have identified eight thinking strategies that enable geniuses to generate original ideas:

Einstein's theory of relativity is, in essence, a description of the interaction between different perspectives. Sigmund Freud's analytical methods were designed to find details that didn't fit traditional paradigms in order to come up with a completely new point of view. To solve a problem creatively, you must abandon the first approach that comes to mind, which usually stems from past experience, and reconceptualize the problem. Thus geniuses do not merely solve existing problems; they identify new ones.

Once geniuses have a certain minimal verbal facility, they develop visual and spatial abilities that allow them to display information in new ways. The explosion of creativity in the Renaissance was intimately tied to the development of graphic illustration during that period, notably the scientific diagrams of Leonardo da Vinci and Galileo Galilei. Galileo revolutionized science by making his thought graphically visible while his contemporaries used more conventional means. Similarly, Einstein thought in terms of spatial forms, rather than along purely mathematical or verbal lines. In fact, he believed that words and numbers, as they are written or spoken, did not play a significant role in his thinking process.

Thomas Edison held 1,093 patents, still the record. He guaranteed a high level of productivity by giving himself idea quotas: one minor invention every 10 days and a major invention every six months. Johann Sebastian Bach wrote a cantata every week, even when he was sick or exhausted. Wolfgang Mozart produced more than 600 pieces of music. In a study of 2,036 scientists, Dean Keith Simonton of the University of California at Davis found that the most respected scientists produced more "bad" works than their less successful peers.

Like playful children with buckets of building blocks, geniuses constantly combine and recombine ideas, images, and thoughts. Einstein didn't invent the concepts of energy, mass, or speed of light; he simply combined them in a novel way. The laws of heredity

were developed by Gregor Mendel, who combined mathematics and biology to create a new science of genetics.

Their facility to connect the unconnected enables geniuses to see things others miss. Da Vinci noticed the similarity between the sound of a bell and a stone hitting water -- and concluded that sound travels in waves. Organic chemist F.A. Kekule intuited the shape of the ringlike benzene molecule by dreaming of a snake biting its tail. When Samuel Morse was trying to figure out how to produce a telegraphic signal strong enough to transmit coast to coast, he observed teams of horses being exchanged at a relay station. His solution? Give the traveling signal periodic boosts of power.

Geniuses, according to physicist David Bohm, are able to think differently because they can tolerate ambivalence between two incompatible subjects. Another physicist, Niels Bohr, argued that if you hold opposites together in your mind, you will suspend your normal thinking process and allow an intelligence beyond rational thought to create a new form. Example: Bohr's ability to imagine light as both a particle and a wave led to his conception of the principle of complementarity.

Aristotle believed that the ability to perceive resemblances between two separate areas of existence -- to think metaphorically, in other words -- is a special gift. Alexander Graham Bell compared the inner workings of the ear to a stout piece of membrane moving steel -- and, in the process, conceptualized the telephone. Einstein made some of his most stunning discoveries by drawing analogies between abstract principles and everyday occurrences such as rowing a boat or standing on a platform watching a train pass by.

Whenever we attempt to do something and fail, we end up doing something else. That's the first principle of creative accident. We may ask ourselves why we have failed to do what we intended, which is a reasonable question. But the creative accident leads to the question: What have we done? Answering that one in a novel, unexpected way is the essential creative act. It is not luck, but creative insight of the highest order.

Alexander Fleming was not the first physician studying deadly bacteria to notice that mold formed on an exposed culture. A less gifted physician would have dismissed this seemingly irrelevant event, but Fleming thought it was "interesting" and wondered if it had potential. It did: penicillin. One day, when Edison was pondering how to make a carbon filament, he found himself mindlessly twisting a piece of putty in his fingers. He looked down at his hands and found the answer to his problem: Twist the carbon like rope.

This may be the most important lesson of all: When you find something interesting, drop everything and go with it. Too many talented people fail to make significant leaps of imagination because they've become fixated on their preconceived plan. But not the truly great minds. They don't wait for gifts of chance; they make them happen.

by **MICHAEL MICHALKO**

Adapted from an article that originally appeared in the May 1998 issue of The Futurist. Used with permission from the World Future Society, 7910 Woodmont Av., Suite 450, Bethesda, MD 20814; 301/656-8274; www.wfs.org.

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I. Rate yourself on 1-10 scale (do #21 if you skipped one):

SCALE:

- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------|----------|-----------------------|----------|----------|----------|----------|----------|----------|---|
| ___ | 1. | censors | | | | | | | feels |
| ___ | 2. | evaluates | | | | | | | takes risks |
| ___ | 3. | reassures & supports | | | | | | | takes risks |
| ___ | 4. | analyzes | | | | | | | makes connections |
| ___ | 5. | is realistic | | | | | | | plays |
| ___ | 6. | looks at consequences | | | | | | | speculates |
| ___ | 7. | is logical | | | | | | | is curious |
| ___ | 8. | alert to danger | | | | | | | sees the fun in things |
| ___ | 9. | avoids surprises | | | | | | | likes surprises |
| ___ | 10. | avoids wrongness | | | | | | | open to anything |
| ___ | 11. | punishes wrongness | | | | | | | in touch with total experience |
| ___ | 12. | is serious | | | | | | | does not mind being confused |
| ___ | 13. | is pessimistic | | | | | | | is optimistic |
| ___ | 14. | is judgmental | | | | | | | focus on what is going for the idea |
| ___ | 15. | argue | | | | | | | waste no energy evaluating early |
| ___ | 16. | inattention/distant | | | | | | | listen and interested |
| ___ | 17. | be noncommittal | | | | | | | wholly open to being available |
| ___ | 18. | correct and precise | | | | | | | set up win/wins--nobody loses |
| ___ | 19. | dominant/commands | | | | | | | deal with as an equal--eliminate rank |
| ___ | 20. | point out flaws | | | | | | | see the value in/assume valuable implic's |
| ___ | 21. | fearful | | | | | | | is impetuous |

(over)

II. Now rate yourself on the following items on a 1-10 scale (10 being high and 1 being low).

SCALE: Low Medium High
 1 2 3 4 5 6 7 8 9 10

- ___ 1. self-confident
- ___ 2. risk-taking
- ___ 3. high in energy
- ___ 4. stubborn
- ___ 5. curious
- ___ 6. playful, childlike
- ___ 7. resists domination
- ___ 8. enthusiastic
- ___ 9. wide interests
- ___ 10. non-participation in class activities
- ___ 11. good sense of humor
- ___ 12. idealistic
- ___ 13. reflective
- ___ 14. uncooperative
- ___ 15. need privacy, alone time
- ___ 16. artistic interests
- ___ 17. capriciousness
- ___ 18. low interest in details
- ___ 19. too emotional
- ___ 20. adventurous
- ___ 21. aesthetic interests
- ___ 22. attracted to novelty, complexity, and the mysterious
- ___ 23. sometimes uncommunicative
- ___ 24. forgetful, absentmindedness, mind wanders
- ___ 25. egocentric
- ___ 26. too demanding
- ___ 27. autonomous
- ___ 28. open-minded
- ___ 29. ambitious
- ___ 30. temperamental
- ___ 31. sloppiness and disorganization with unimportant matters
- ___ 32. dresses differently
- ___ 33. does things different from standard procedures
- ___ 34. imaginative
- ___ 35. is full of ideas
- ___ 36. is a "what if?" person
- ___ 37. high verbal, conversational ability
- ___ 38. not afraid to try something new
- ___ 39. uses all senses in observing
- ___ 40. ability to regress and transform items

effective

satisfying

in order

novel

yielding potential improvement

beautiful

useful

fruitful

applicable

surprising

coherent

good

truthful

appropriate

sensible

tenable

now

minimal in requirements, expenditure, or input cost

a change for the better

"Creativity researchers" seem to agree that creative products, in general, meet two criteria: novelty and appropriateness. The words around are extracted from a sample of literature that inquired the characteristics of creative products. The words apply to the above mentioned criteria and also to creative products of "higher" levels (i.e., those creative products that possess creativity characteristics beyond satisfying the "appropriately novel" criterion, and are thus more creative). Albeit most people believe the criteria of novelty to be most central to creativity, most words appear to be subsumable under the appropriateness criteria. Can you find with words might pertain to "higher" levels of creativeness?

simple

insightful

valuable

reorganized

comprehensive

relevant

important

generalizable

meaningful

logical

warranting intrinsic worth

responsive

pragmatic

necessary

fitting

valid

right

fetchingly precious

solved problems

Albeit most people believe the criteria of novelty to be most central to creativity, most words appear to be subsumable under the appropriateness criteria. Can you find with words might pertain to "higher" levels of creativeness?

different

fresh

goal-directed

words appear to be

recognizable

workable

subsumable under the appropriateness criteria. Can you find with words might pertain to "higher" levels of creativeness?

fulfilling

constructive

aesthetic

obvious

true

ingenious

divergent

intelligible

efficient

of high quality

inspirational

intrinsically motivated

new solutions

clever

transformations

intrinsically motivating

understandable

stimulating

elegant

apt

practical

condensations

savoring

pleasurable

controlled

correct

harmonious

adaptive to reality

free

adequate

chaos

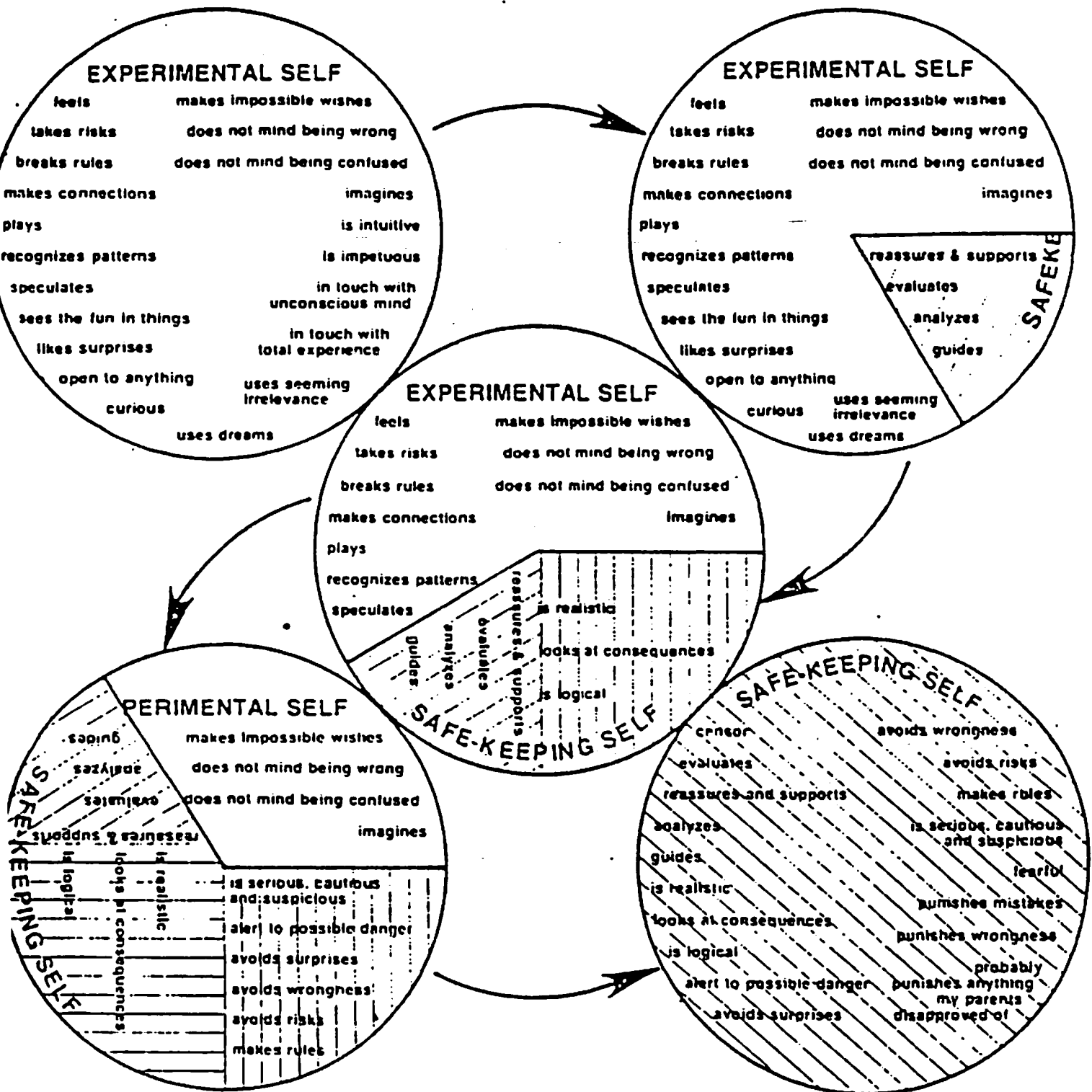


Figure 2

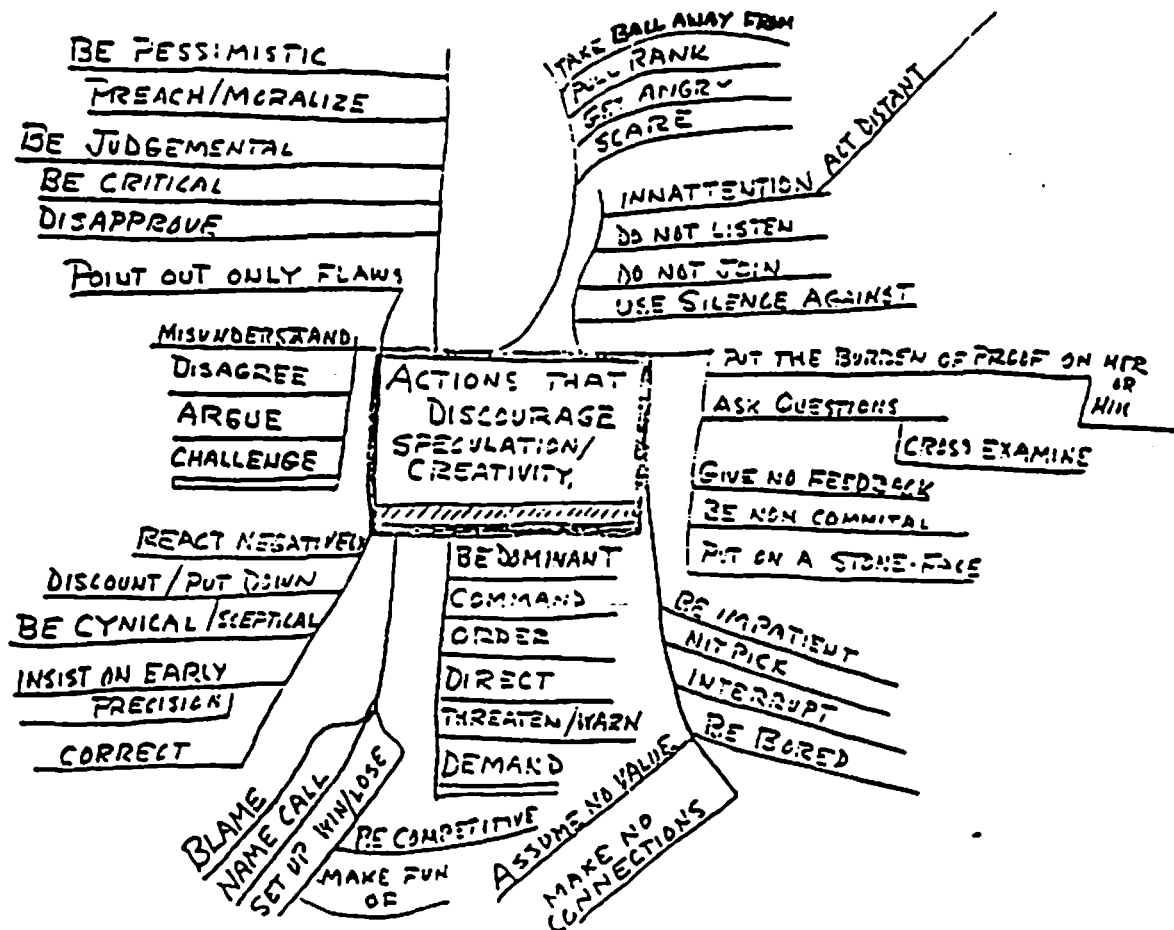
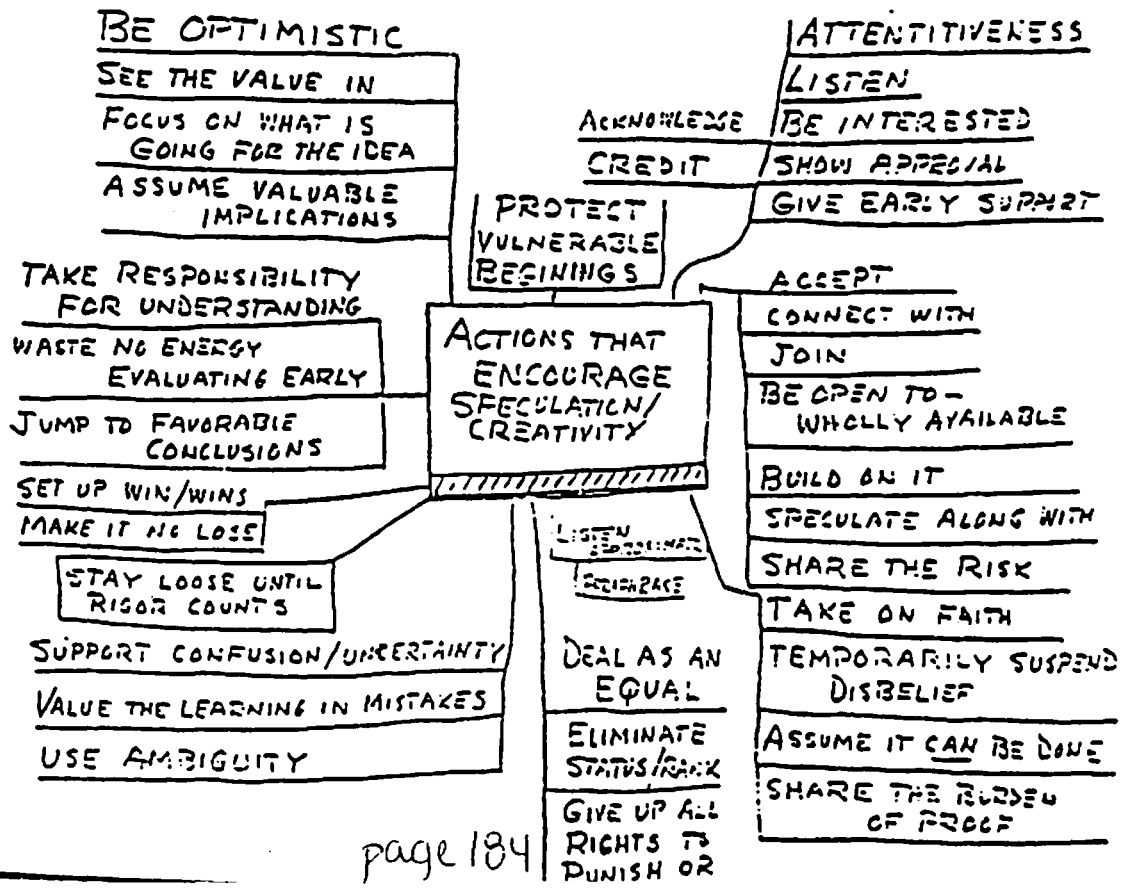
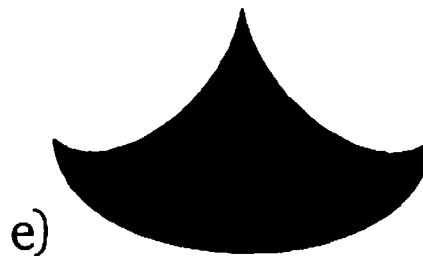
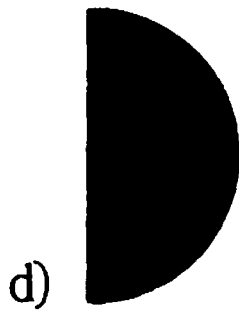
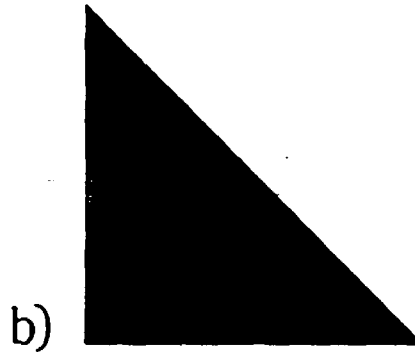
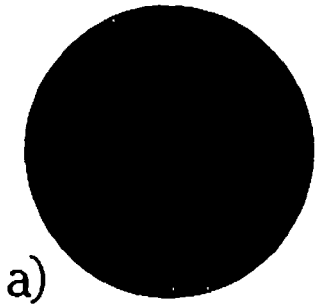


Figure 8



1. "The Right Answer."
2. "That's Not Logical."
3. "Follow The Rules."
4. "Be Practical."
5. "Avoid Ambiguity."
6. "To Err Is Wrong."
7. "Play Is Frivolous."
8. "That's Not My Area."
9. "Don't Be Foolish."
10. "I'm Not Creative."

Exercise. Five figures are shown below. Select the one that is different from all of the others.

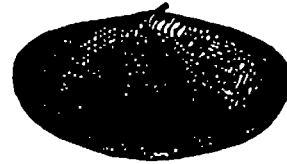


Here, then, is my recommendation for high creative performance:



When you're searching for new information, be an Explorer.

When you're turning your resources into new ideas, be an Artist.



When you're evaluating the merits of an idea, be a Judge.

When you're carrying your idea into action, be a Warrior.



Exercise: Now, here's a chance for you to rate each of your creative roles.

How would you rate your **Explorer**?

- 1. My friends call me "ostrich head."
- 2. I see only what's in front of me.
- 3. I make time to explore.
- 4. "Go and find it" is my middle name.
- 5. Columbus, Madame Curie, and Apollo 11 all rolled into one.

How would you rate your **Artist**?

- 1. My imagination's in prison.
- 2. I can follow a recipe.
- 3. I'm usually good for a new insight.
- 4. Part magician, part poet, part child.
- 5. Picasso and Einstein, make room!

How would you rate your **Judge**?

- 1. Decision-making: what's that?
- 2. Flipping a coin would get better results.
- 3. I can usually pick out what's worth building on in a new idea.
- 4. I'm right more often than not.
- 5. Wisdom of Solomon.

How would you rate your **Warrior**?

- 1. A real wimp.
- 2. I'm fine until I hit a good excuse or two.
- 3. I get up when I'm knocked down.
- 4. I get things done.
- 5. In the ranks of Caesar and Patton.

Explore of Technology Web Sites and Ideas

(e.g., see ResourceShare.com)

In order to help you better understand potential e-learning technology, we will examine some popular technology sites and resources. These sites are not meant to be comprehensive, but to simplify this task, many sites that provide demos and downloads were selected. Please explore these Web sites and write down your impressions in the attached observation sheets for later discussions.

Observation Sheet

Company/Tool and/or Site or Project Name	Tool or Web Site Options or Design Features	Strengths	Weaknesses	Other Comments (e.g., interesting features, pedagogy, partnerships, free stuff, etc.)

Rating Scheme for Web Site Resources

CourseShare.com has rated the applicable Web sites for overall effectiveness. The following three dimensions were used to evaluate effectiveness: ease of use, content richness, and resourcefulness. These dimensions and their characteristics are described in the table below.

First, each Web site was assigned a value between 1 and 3 points for each dimension, where 1 is poor, 2 is average, and 3 is a good. Second, we added the points from each dimension into a single score that ranges from 3-9 points. Finally, we used the following formula to convert points into stars for the overall effectiveness ranking.

- 9 points = 5 stars
- 8-7 points = 4 stars
- 5-6 points = 3 stars
- 4 points = 2 stars
- 3 points = 1 star

Each site was scored by at least two CourseShare.com consultants. When they did not agree on a final score, agreement was reached through discussion and deliberation. Additionally, the consultants provided summary comments describing each site. Web sites receiving less than three stars are not included in our final list of resources.

Dimensions	Evaluated Characteristics
Ease of use within the Web site	<ul style="list-style-type: none"> • Simple and effective navigation • Quick download rate • Sound organizational structure • Intuitive user interface • The site is regularly updated (i.e., no dead links or outdated information)
Content richness within the Web site	<ul style="list-style-type: none"> • Content is insightful • Content is creative • Provides thorough descriptions • Provides full articles when applicable • The site/host is trustworthy
Resourcefulness in links to other Web sites	<ul style="list-style-type: none"> • Includes relevant links to other sites • Cites relevant resources such as books, articles, and reports • Cites relevant people and organizations to contact

A PERIODIC TABLE OF VISUALIZATION METHODS

Data Visualization Visual representations of quantitative data in schematic form (either with or without axes)		Strategy Visualization The systematic use of complementary visual representations in the analysis, development, formulation, communication, and implementation of strategies in organizations		Information Visualization The use of interactive visual representations of data to complete cognitive tasks. This means that the data is transformed into an image, it is mapped to screen space. The image can be changed by users as they proceed working with it.		Metaphor Visualization Visual Metaphors position information graphically to organize and structure information. They also convey an insight about the represented information through the key characteristics of the metaphor that is employed.		Concept Visualization Methods to represent concepts, or abstract concepts, data, plans, and processes.		Compound Visualization The complementary use of different graphic representation forms in one single screen or frame.																									
C cuboctahedron	Tb table	Ca cathart cathartism	He helium helium	Mm matrix map	Tm tangent	St story storytelling	Tr tree	Gt ghost	Co communication diagram	Fp flight plan	Cs conceptual diagram	Br bridge	Fu funnel	Ri risk picture																					
Pi pie chart	L line chart	B bar chart	Ac area chart	R radar chart cobweb	Pa parallel coordinates	Hy hyperbolic tree	Cy cycle diagram	T timeline	Ve venn diagram	Mi mindmap	Sq square of opposition	Ce conceptual diagram	Ar argument diagram	Sw swim lane diagram	Ge goal diagram	Pm process diagram	D diamond diagram	Pr paracenter ruler	Kn knowledge map																
Hi histogram	Sc scatterplot	Sa sawtooth diagram	In information tree	E entity relationship diagram	Pt point plot	Fi flow chart	Cl clustering	Lc layer chart	Py pyramid diagram	Ce conceptual diagram	Ti timeline map	Dt diamond diagram	Gp goal oriented task analysis	Cf conceptual diagram	Co conceptual diagram	Ic iceberg	Lm learning map	tk task box plot	Sp spectrogram	Da data map	Tp treemap	Cn cone tree	Sy system diagram / simulation	Df data flow diagram	Se semantic network	So soft system modeling	Sn strategy map	Fo force field diagram	Ib iceberg diagram	Pr process event chart	Pe perspective diagram	Ev event diagram	V venn diagram	Nh network diagram	I inflectional

Note: Depending on your location and connection speed it can take some time to load a pop up picture.

version - 5

Cy Process Visualization

Hy Structure Visualization

- Overview
- Detail
- Detail AND Overview
- Divergent thinking
- Convergent thinking

Su supply demand curve	Pe performance diagram	St strategy map	Oc organization chart	Ho house of quality	Fd fishbone diagram	Ft future tree	Mq map diagram	Ld life-cycle diagram	Po poem's line layout	S s-cycle	Sm salesletter map	Is ishikawa diagram	Tc technology roadmap
Ed efficiency box	Pf portfolio diagram	Sg strategic game board	Mz maslow's organogram	Z zinky's morphological box	Ad advertising diagram	De discovery diagram	Bm big matrix	Stc strategy cann	Vc value chain	Hy hype-cycle	Sr salesletter strategy map	Ta top	Sd spray diagram

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BRAINSTORMING PERFECTED

Having trouble coming up with new ideas? Author Kishore Dharmarajan suggests these tips for generating innovative ideas and breakthrough solutions:

ASK QUESTIONS. Ask questions for which you have no answers. It forces you to leave your comfort zone and stretch your imagination.

SEEK INSPIRATION FROM OTHER FIELDS. For example, if you are in banking, look at scuba diving for ideas. Jot down five things that come to your mind when you think of scuba diving, such as goggles, floating objects, oxygen tanks, and coral reefs. Now think of banking ideas that relate to those items.

COMBINE DIVERSE ELEMENTS. All new ideas are combinations of old concepts. Look for existing ideas in your workplace that you can combine to create a new entity.

TAKE A 180-DEGREE LOOK. When you are looking for a solution, try solving the opposite of the problem.

VISUALIZE THE SITUATION. If you have difficulty describing your problem, draw it. Even simple scribbles can help turn complex problems into easy-to-understand situations.

USE RAPID-THINKING TECHNIQUES. If it is difficult to generate one idea, try to think of 10. Often, the thought of getting many optional solutions to a problem will lessen the strain of the idea-generating process. Plus, the act of generating multiple solutions in rapid succession will improve your innovative skills.

SKIP THE OBVIOUS. Initial ideas will often be the weakest. Keep your eyes open for these thoughts and use them as a support to move ahead.

USE HUMOR. Think of a hilarious comment or observation about your problem. Humor can trigger unexpected, creative ideas.

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Young women are finding it challenging to develop a leadership style. Many are caught between being seen as weak leaders or—if they are forceful—as unfeminine, according to a recent *Wall Street Journal* article.

To find success, women must enlist several strategies, including joining a professional association, seeking out a mentor and soliciting feedback on leadership styles, and being direct and straightforward when managing others.

Although women can learn management styles from observing others, the article suggested that they find female role models who can help navigate the female stereotypes that exist.

Professional associations can give young women the chance to find female role models as well as offer safe environments in which they can test out different management styles.

But, simply joining different associations won't solve women's battle to reach leadership positions. The fact is that few women will make it into that boardroom chair without a strong network, according to Herminia Ibarra, a professor at INSEAD business school, who has studied women's leadership styles.

"More often than not, mixed work and play networks do not work for women. Male executives may go off for a round of golf over the weekend, forging bonds this way, but how often would a female executive be included in this kind of 'old-boy' network event? Where then will she develop her socio-professional network?" asks Ibarra in a company press release.

"Women therefore need to develop two distinct networks—one within the company with male peers to gain relevant 'instrumental' information on company technical knowledge, workings, culture and people; and a second with a mix of men and women to meet 'psychosocial needs,' such as sharing experiences, getting mentoring, and building identity."

—Paula Ketter
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Idea Squelchers:

"We've never done it before."

"It won't work."

"Too modern" or "Too old fashioned."

"It's not in the budget."

"You've gotta be kidding."

"What bubblehead thought that up?"

"Let's wait and see."

"That's not our job."

"It's not in the curriculum."

"It's too late"

"Don't rock the boat."

"That's not our department."

"I'll bet some professor suggested that."

The Creativity Case

Lebanon High School has heard enough about the need to increase worker creativity, problem solving, and higher-order thinking skills. After an initial community meeting, it was decided the high school (and entire school district for that matter) needs to address these skills in a master plan.

Assume you have been assigned to (or volunteered for) a committee to embed creative thinking techniques into this high school. **Reluctant and supportive** teachers (1-4), parents (5-8), principals (9-11), real estate agents (12-13), community leaders (14-17), students (18-19), corporate executives (20-21), professors from IU and Purdue (22-23), and other distinguished guest are in attendance (24-26) at this second planning meeting. You will be assigned one of these roles as well as a thinking rôle.

As in most initial meetings, there are lots of ideas, limited leadership and direction, and excitement as well as pessimism in the air. However, you should concentrate on the following:

1. What is your opinion about what need to be done?
2. What should be done next?
3. Be sure to comment on the ideas of the others.
4. Any resolutions????

=====

Later on: Assume this committee is loaded with "Idea Squeechers." You keep hearing: "it'll Never Fly Wilbur!" I want to identify ways to increase creative thinking in this teaching/learning environment. First you must identify the barriers.

1. What are 4-5 blockers, hinderances, barriers, roadblocks, problems to achieving increasing creative thinking here in Lebanon?
2. In groups of 3-4 people put 3 roadblocks on 4 X 6 cards (or on paper)
3. Collect and read comments and problems foreseen.
4. Redistribute cards and creatively think of ways to solve these.
5. Report back

Idea Spurring--Osborn

1. Put to other uses? Other uses if modified?
2. Adapt? What other ideas does this suggest? What could I copy?
3. Modify? New twist? Change color, meaning, motion, sound, odor, form?
4. Magnify? Stronger? Higher? Longer? Thicker? Exaggerate? Multiply?
5. Minify? What to subtract? Smaller? Miniature? Streamline? Omit?
6. Substitute? What else instead? Other material? Other place? Approach?
7. Rearrange? Other pattern? Other layout? Change pace? Change schedule?
8. Reverse? How about the opposite? Turn it backward? Turn tables?
9. Combine? Combine units? Combine appeals? Combine ideas?

Attribute Listing (changing an attribute or quality of something)

Attribute Modifying. The problem solver lists main attributes (characteristics, dimensions, parts) of a problem object, then thinks of ways to improve each attribute.

Attribute Transferring. Using metaphorical thinking to transfer ideas from one context to another (artists, cartoonists, composers, and writers).

Checkerboarding. To analyze problems with two key variables or components. Interactions among attributes of two variables are investigated for possible problem solution.

Webbing: A process to determine directions of interest in a specific topic or subject, illustrated by a graphic organizer. For example, a semantic web/map is a diagram to help children see the relatedness of words.

Idea Checklists: A way of forcing relationships and analogies, often used to facilitate the flow of ideas during dry spells. For instance, one might ask, "How could making part X become bigger or smaller or possibly come to life help in solving this problem?"

Synectics: Derived from the Greek word "synecticos" meaning the joining together of apparently unrelated elements. Originated by William J. J. Gordon to make strategies that people use unconsciously, better known and teachable. Through connection making, one can bring a strange concept into a familiar context and foster the understanding of new information. Synectics uses "direct analogy" (How have animals and plants solved this problem?); "personal analogy" (If I became a computer, how would I feel?); "fantasy analogy" (How can we get ovens to clean themselves?); "compressed conflict" (two-word phrase that sums up the conflicting nature of an object or idea--peaceful conflict, useful dirt, careful collision).

Attribute Listing

Notes from "Creating Workforce Innovation" by Michael Morgan - published by Business and Professional Publishing 1993

Attribute listing is a great technique for ensuring all possible aspects of a problem have been examined. Attribute listing is breaking the problem down into smaller and smaller bits and seeing what you discover when you do.

Let's say you are in the business of making torches. You are under pressure from your competition and need to improve the quality of your product. By breaking the torch down into its component parts - casing, switch, battery, bulb and the weight - the attributes of each one - you can develop a list of ideas to improve each one.

Attribute Listing - Improving a torch

Feature	Attribute	Ideas
Casing	Plastic	Metal
Switch	On/Off	On/Off low beam
Battery	Power	Rechargeable
Bulb	Glass	Plastic
Weight	Heavy	Light

Attribute listing is a very useful technique for quality improvement of complicated products, procedures for services. It is a good technique to use in conjunction with some other creative techniques, especially idea-generating ones like brainstorming. This allows you to focus on one specific part of a product or process before generating a whole lot of ideas.

A related technique is that of morphological analysis.

Last updated: 17th October 1996

Morphological Forced Connections

This application of attribute listing is contained in **The Universal Traveler** which authors Koberg and Bagnall call "Morphological Forced Connections". They give the following rules for their "foolproof invention-finding scheme" along with an example showing how their scheme works. Here it is:

1. List the attributes of the situation.
2. Below each attribute, place as many alternates as you can think of
3. When completed, make many random runs through the alternates, picking up a different one from each column and assembling the combinations into entirely new forms of your original subject.

After all, inventions are often new ways of combining old bits and pieces.

Example: Improve a ball-point pen

Cylindrical	Material	Cap	Ink source
Faceted	Metal	Attached Cap	No Cartridge
Square	Glass	No Cap	Permanent
Beaded	Wood	Retracts	Paper Cartridge
Sculptured	Paper	Cleaning Cap	Cartridge Made of Ink

Invention: A Cube Pen; once corner writes, leaving six faces for ads, calendars, photos, etc.

Another use of attribute listing, credited to Fritz Zwicky, is called **Morphological Analysis** and is an automatic method of combining parameters into new combinations for the later review of the problem solver. A selection of parameters or attributes is chosen and combinations explored. You could imagine three attributes as X, Y and Z axes.

An excellent way of implementing this method is with a computer program to enumerate the combinations and prompt the user with random combinations. Often the combinations are useful idea prompters and stepping stones to other solutions. I have such a program written in Hypercard, but the technique is not difficult.

Of additional value is to have a collection of attribute lists for plugging into your morphological analysis. Here are some of mine:

Human Ages	Baby, Toddler, Pre-Schooler, Child, Adolescent, Adult, Retired
Time Units	Milli-seconds, Seconds, Minutes, Hours, Morning/Afternoon/Evening, Days, Weeks, Fortnight, Month, Quarters, Years, Decades, Century
Colours	Red, Orange, Yellow, Green, Blue, Indigo, Violet, Black, White, Brown, Pink, Crimson
Meals	Breakfast, Snack, Lunch, Dinner, Supper, Snack
Six Questions	Who, What, When, Where, How, Why

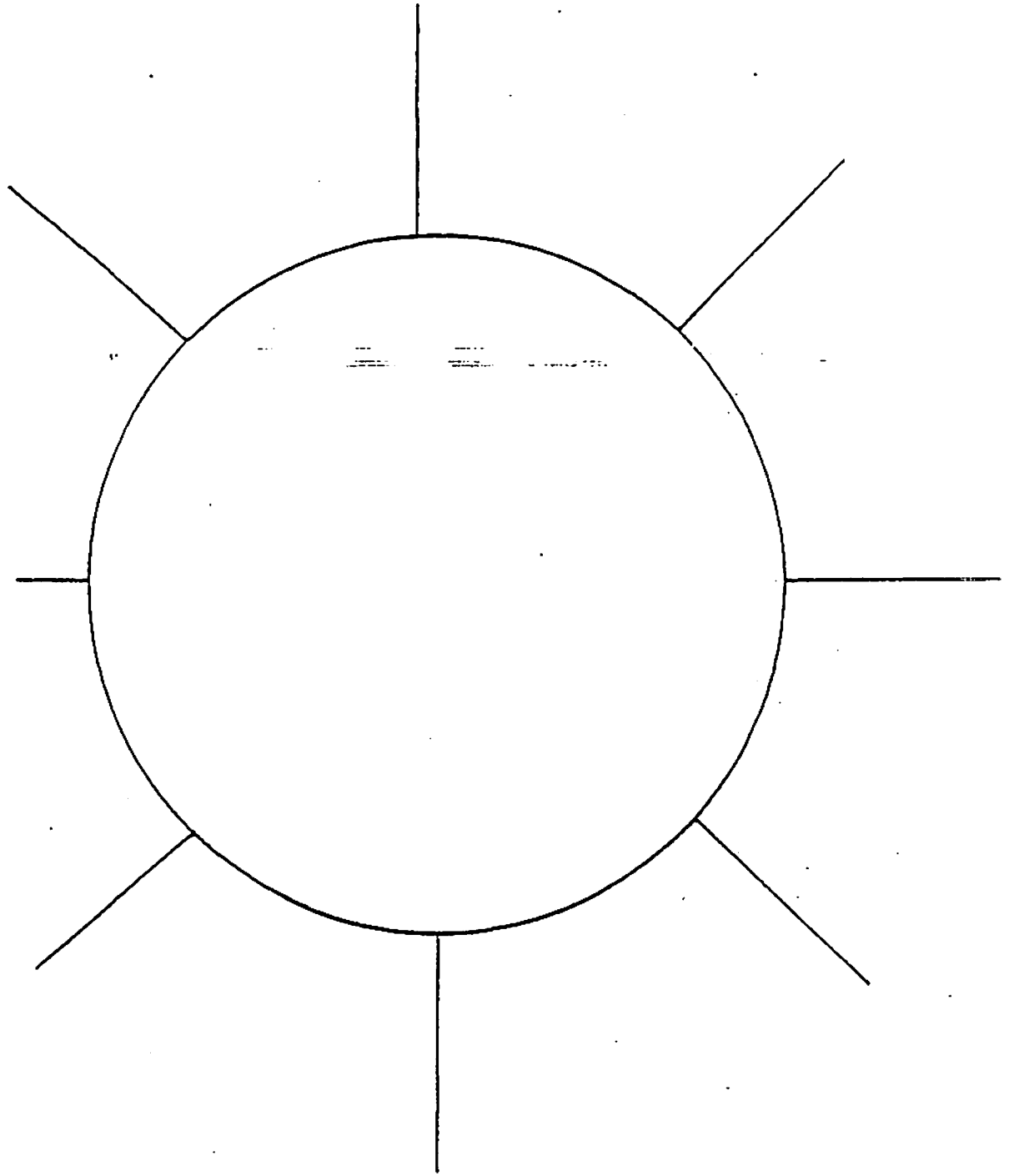
Think of the very popular books produced by Rick Smolan (photographer) which included **A Day in the**

Life of Australia and his more recent **A Day in the Life of Cyberspace**. My using morphological analysis, you could replace **A Day** with the list of time units, **Life** could be replaced with **Birth/Death/Growth/Decay** and the last word could be replaced with a list of your areas of interest, eg **My Family, My Country, My Dog**.

As you evaluate the combinations, you will encounter such combinations as: "A Year in the Death of my employer" which could prompt you to examine the decline of your employer following your retrenchment. (I speak from experience!).

Last updated: 18th October 1996

Send your comments to [Charles Cave](#)



7

Concept Mapping

Concept mapping is a technique that allows you to understand the relationships between ideas by creating a visual map of the connections. Concept maps allow you (1) to see the connections between ideas you already have (which can be helpful in studying for a test); (2) to connect new ideas to knowledge that you already have (which can help you organize ideas as you find them in researching a paper; and (3) to organize ideas in a logical but not rigid structure that allows future information or viewpoints to be included (which can help you decide how you want to organize a paper). Concept mapping looks like clustering (a type of freewriting that is almost completely unstructured and that works by free association), but it goes one step further by revealing a clear relationship between the ideas that you're writing about. While concept mapping is more structured than prewriting, it is less structured and more flexible than formal outlining (which puts ideas in a sequence and organizes them by hierarchy or levels of importance), and so it allows you to see more complex relationships between ideas than just sequence and hierarchy.

To create a concept map, you should first read widely on your subject until you can list 10-15 key concepts or ideas and several examples. A concept is an abstract idea that is not limited to just one place or time. An example is one instance of a concept. For example, "subliminal advertising" is a concept and "Seagram's advertisement in Newsweek" is an example of the concept. The following steps allow you to build a concept map; remember that you can create many different maps from the same list, depending on how you interpret the relationships between ideas.

1. Transfer the concepts and examples to small pieces of paper or post-it notes (you may want to use different colors for concepts and examples).
2. Arrange the pieces of paper on a large sheet of paper or poster board, with the broadest or most abstract ideas at the top and the most specific ideas at the bottom. Do not include the examples yet.
3. If possible, arrange the concepts so that ideas go directly under ideas that they are related to (often this is not possible because ideas relate to several other concepts. At this point, you may wish to add concepts that help explain, connect, or expand the ideas that you have.
4. Draw lines from upper concepts to lower concepts that they're related to; do the same for any related concepts that are on the same level. You may decide to rearrange the pieces of paper during this stage.
5. This is the most important and most difficult step: on the connecting lines, write words or phrases that explain the relationship of the concepts. For example, you could connect the concept "extracurricular activities" to the concept "resume," with the phrase "should not be included on" (in other words, a resume should not contain a list of extracurricular activities. You

may continue to rearrange the pieces of paper to make the relationships easier to visualize.

6. Put the examples under the concepts they belong with, and connect the concept to the example with a phrase like for example.

7. Copy the results of the above steps onto a single sheet of paper. Instead of post-it notes, draw circles around the concepts. Do not draw circles around the examples.

Here is an example of a partial concept map of terms from American History. (Note: this sample concept map does not contain examples--each term is treated as an idea or concept.)

Concepts: Reconstruction; presidential reconstruction; radical reconstruction; racial equality; Fourteenth Amendment; Fifteenth Amendment; Black codes; Johnson's plan; Congressional plan.

The broadest term is Reconstruction, since it encompasses all the other terms. Presidential and Radical Reconstruction are phases of Reconstruction, so they'd go directly under Reconstruction. Since Johnson's Plan and the Congressional Plan help define the two phases, they'd probably go next. The terms in order would be:

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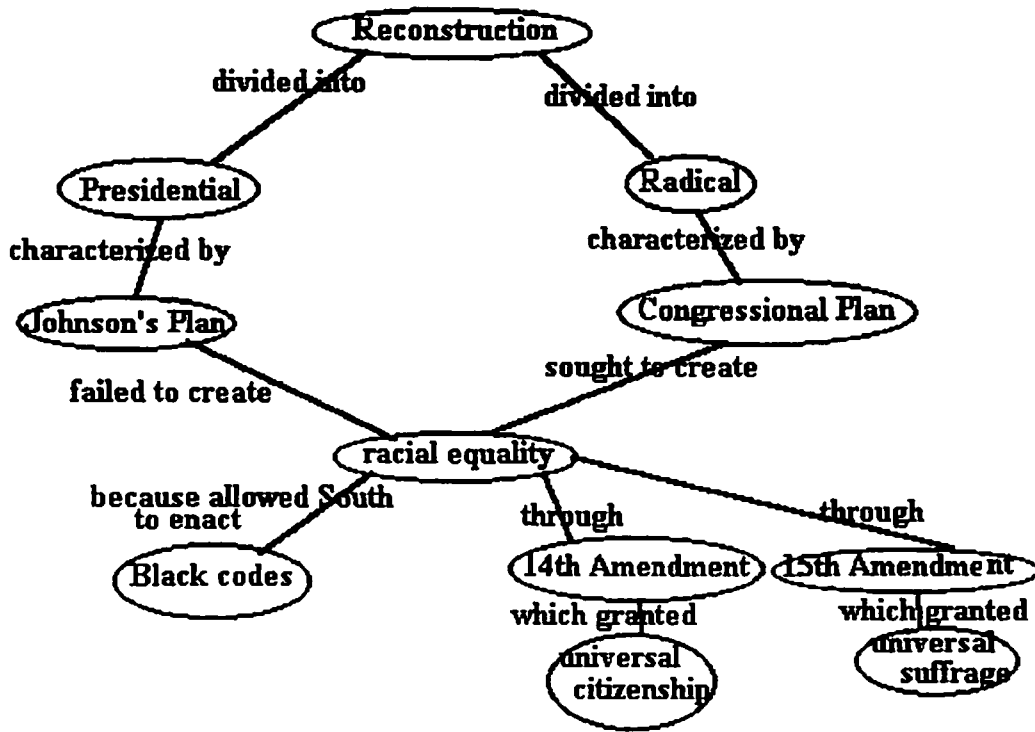
Reconstruction
  Presidential      Radical
    Johnson's Plan  Congressional plan
      racial equality
Black codes      Fourteenth Amendment      Fifteenth Amendment
  
```

Several terms or concepts would help expand the relationships. The expanded list might look like this:

```

Reconstruction
  two periods:
    Presidential      Radical
      moderate reform  radical reform
    Johnson's plan    Congressional plan
      racial equality
Black codes      Fourteenth Amendment      Fifteenth Amendment
                  Universal citizenship      Right to vote
  
```

With circles and links, the finished concept map would be:



For more information on concept mapping, see [Resources on concept mapping](#)

[Return to Handouts page](#)

Checklists

Alex Osborn in his pioneering book **Applied Imagination** talks about "Questions as spurs to ideation", and outlines about 75 idea-spurring questions in his book.

The simplest set of questions comes from the six basic questions described in the Ask Questions section of the Creativity Web.

1. **Why** is it necessary?
2. **Where** should it be done?
3. **When** should it be done?
4. **Who** should do it?
5. **What** should be done?
6. **How** should it be done?

The **What other uses?** is a good question for by adding uses we can often add value. By piling up alternatives by way of other uses, a still **better** use is likely to come to light.

Osborn went on with the following questions:

- Adapt?
- Modify?
- Substitute?
- Magnify/Maximise?
- Minimise/Eliminate?
- Rearrange?
- Reversal?
- Combine?

Thinkertoys

Michael Michalko, in his book **Thinkertoys** describes the rearrangement of the above questions (by Bob Eberle) into the mnemonic SCAMPER (Substitute, Combine Adapt, Modify, Put to other uses, Eliminate, Reverse).

Start applying these questions to your problems and see what ideas come forth.

Last updated: 18th October 1996

Send your comments to Charles Cave

Analogies & Synectics

1. Use the *direct analogy* strategy to think of ideas for removing three inches of water from your basement floor. (E.g., ask "How do animals, plants, or other phenomena in nature move water from here to there?")

2. Use the *personal analogy* method to help you think of ideas for encouraging elementary children to finish their cafeteria lunches, and not waste food. (E.g., ask "What would I be like if I were a lunch that was ALWAYS 100 percent eaten?" Or "What would my attitude or personality be if I were a kid that ALWAYS finished his or her lunch?" Or "What kind of cafeteria would I be if I STRONGLY encouraged kids to finish their lunches?")

3. Use the *fantasy analogy* method to think of ideas for improving school attendance ("What in my wildest imagination would make kids hate to miss school?")



The term Synectics from the Greek word *synectikos* which means "bringing forth together" or "bringing different things into unified connection."

Since creativity involves the coordination of things into new structures, every creative thought or action draws on synectic thinking.

Creative behaviour occurs in the process of becoming aware of problems, deficiencies, gaps in knowledge, missing elements, disharmonies, bringing together in new relationships available information; identifying the missing elements; searching for solutions, making guesses, or formulating hypotheses.

- *E Paul Torrance*

Creativity is the marvellous capacity to grasp mutually distinct realities and draw a spark from their juxtaposition - *Max Ernst*

A man becomes creative, whether he is an artist or scientist, when he finds a new unity in the variety of nature. He does so by finding a likeness between things which were not thought alike before - *Jacob Bronowski*

Buckminster Fuller summed up the essence of Synectics when he said all things regardless of their dissimilarity can somehow be linked together, either in a physical, psychological or symbolic way.

Synectic thinking is the process of discovering the links that unite seemingly disconnected elements. It is a way of mentally taking things apart and putting them together to furnish new insight for all types of problems.

William Gordon set forth three fundamental precepts of synectic theory:

1. Creative output increases when people become aware of the psychological processes that control their behaviour
2. the emotional component of creative behaviour is more important than the intellectual component; the irrational is more important than the intellectual component
3. the emotional and irrational components must be understood and used as "precision: tools in order to increase creative output.

Three Lessons

1. The Synectic Attitude

<http://members.ozemail.com.au/~caveman/Creative/Techniques/synectics.htm>

1/15/2003 Page 205

- Synectics encourages the ability to live with complexity and apparent contradiction
- Synectics stimulates creative thinking
- Synectics mobilises both sides of the brain, the right brain (the dreamer), and the left brain (the reasoner)
- Synectics provides a free-thinking state of consciousness

In a free-thinking state, analogies between perceptions, concepts, or even systems and abstractions tend to occur repeatedly. - *Silvano Arieti*

Creativity demands flexibility and imaginativeness but also tightly organised thought processes, matched by a high degree of emotional and psychological freedom. - *R. L. Razik*

2. The Synectic Trigger Mechanisms

- Synectic Trigger mechanisms catalyse new thoughts, ideas and inventions
- Synectic Theory is based on disruptive thinking - similar to the PO operation of Edward de Bono

The creative process is a matter of continually separating and bringing together, bringing together and separating, in many dimensions - affective, conceptual, perceptual, volitional and physical - *Albert Rothenberg*

3. The Synectic Ways of Working

- Synectics is based on the fusion of opposites
- Synectics is based on analogical thinking
- Synectics is Synergistic. Its action produces a result which is greater than the sum of its parts.

The world is totally connected. Whatever explanation we invent at any moment is a partial connection, and its richness derives from the richness of such connections as we are able to make. - *Jacob Bronowski*

The Synectic Pinball Machine

Synectic thinking is like a mental pinball game. Stimulus input bounced against the scoring bumpers (the Trigger Questions) is transformed. Ordinary perceptions are turned into extraordinary ones; the familiar or prosaic is made strange. Synectic play is the creative mind at work.

Let's get started!

Ideas are not born in a vacuum. First of all, you must identify the problem you have and write it down. Next, you must gather information about it to mix in with the information already stored in the brain.

Now do something. Take creative action by using the Trigger Questions to transform your ideas and information into something new. These questions are tools for transformational thinking and may lead you to some great discoveries.

Books

Design Synectics - Stimulating Creativity in Design
Nicholas Roukes, Published by Davis Publications 1988.
Synectics by W.J.Gordon (possibly out of print)
The Practice of Creativity by Gordon Prince.

Software

The Axon Idea processor contains a set of Synectics questions as part of its checklist system.

MacSynectics is a Hypercard stack (for Apple Macintosh) of trigger questions allowing the user to be presented with questions at random, and to record the ideas generated during the session. Go to the Hypercard Software section.

Last updated: 5th April 1997

Forced Analogy

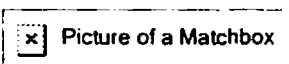
Forced analogy is a very useful and fun-filled method of generating ideas. The idea is to compare the problem with something else that has little or nothing in common and gaining new insights as a result.

You can force a relationship between almost anything, and get new insights - companies and whales, management systems and telephone networks, or your relationship and a pencil.

Forcing relationships is one of the most powerful ways to develop ways to develop new insights and new solutions. A useful way of developing the relationships is to have a selection of objects or cards with pictures to help you generate ideas. Choose an object or card at random and see what relationships you can force.

Use mind-mapping or a matrix to record the attributes and then explore aspects of the problem at hand.

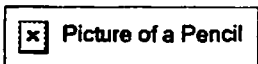
Corporation as a matchbox



Robert Olson in his book *The Art of Creative Thinking* describes the problem of examining a corporate organisation structure by comparing it to a matchbox.

Matchbox Attributes	Corporation
Striking surface on two sides	The protection an organisation needs against strikes
Six Sides	Six essential organisational divisions
Sliding centre section	The heart of the organisation should be slidable or flexible
Made of cardboard	Inexpensive method of structure - disposable

Marriage as a pencil



Betty Edwards in her book *Drawing on the Artist Within* shows the example of a pencil used to examine aspects of a marriage.

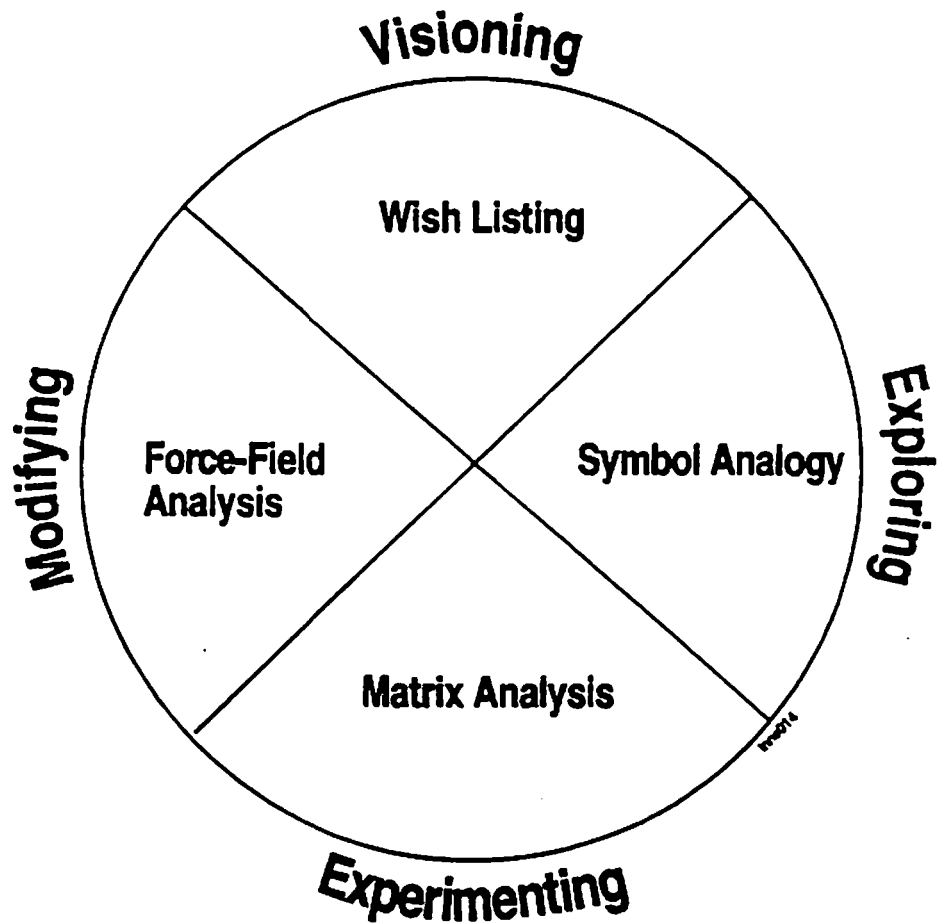
Pencil	Marriage
Gold Ring	Remember promises
Blue Ring	Clean the tub. I share depression too often with family
Yellow	Too timid. Harold needs to know my true feelings
Flat side	Dull daily routine. Change activities

Six sides	6 things to do: Budget, Take a class, Improve discipline, be more assertive, start now!, improve communications
Eraser	Rub him out! Forgive and forget past mistakes
Money	Spend too much. Need a budget. Take a job
Superior	I feel inferior to my husband
Wood shaft	Feel closed in. Need other interests. Am I getting shafted?
Lead	Get the lead out! Do It! if I press any harder I will break.
Write	Send a note telling Harold that I love him.

Last updated: 18th October 1996

Send comments to [Charles Cave](#)

Idea Generation Techniques

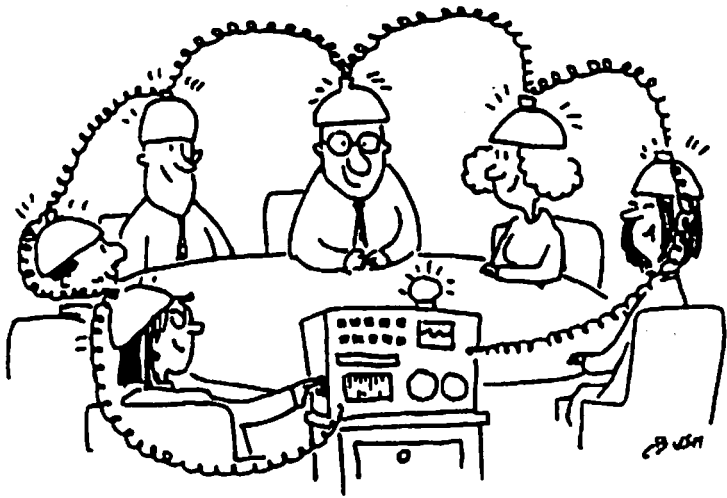




Issue

Based on the work you completed during the Introductory module, rewrite the issue you will be working on.


Issue:





Wish Listing: Techniques

Directions

1. Define and describe the challenge for which you want some new, creative ideas.
2. Close your eyes and relax.
3. Imagine an ideal outcome to the problem.
4. Write a wish list of ideas about the ideal unlimited solution.
5. Generate more specific ideas to make each wish practical.



Wish Listing: Example

Challenge: Develop breakthrough approaches to selling cars at our dealership.

List the wishes that represent your ideal, unlimited solution.

Customers would enjoy the experience of coming into the dealership just to browse.

Customers would feel free of pressure while getting information.

Customers would be offered unique services.

The cars would "sell themselves."

Representatives would see themselves as helpers rather than salespeople.

Price would not be the focus on haggling and bargaining.

Wish List Item

Customers would enjoy the experience of coming into the dealership just to browse.

Specific Idea

Free refreshments

Unique "living room" decor

Cars are shown off in a great variety of ways

Wish List Item

Customers would feel free of pressure while getting information.

Specific Ideas

Interactive computer and CD-ROM systems placed conveniently for use

Reps trained to serve as "guides" rather than salespeople

Wish Listing: Application

Directions

1. Identify the challenge that you are facing.
2. Work individually for 5 minutes on steps 1-5 of the Wish-List technique. Use the worksheets on the following pages, or other idea gathering approaches, as assigned.
3. After 5 minutes, form groups of 4-5 people.
4. Work with your small group at a flipchart for 5 minutes.
 - List your ideas.
 - Generate additional ideas.
5. Be prepared to share your ideas with the large group.

Wish Listing: Ideas

Challenge:

List the wishes that represent your ideal, unlimited solution.

Wish List Item
Specific Ideas

Wish List Item
Specific Ideas

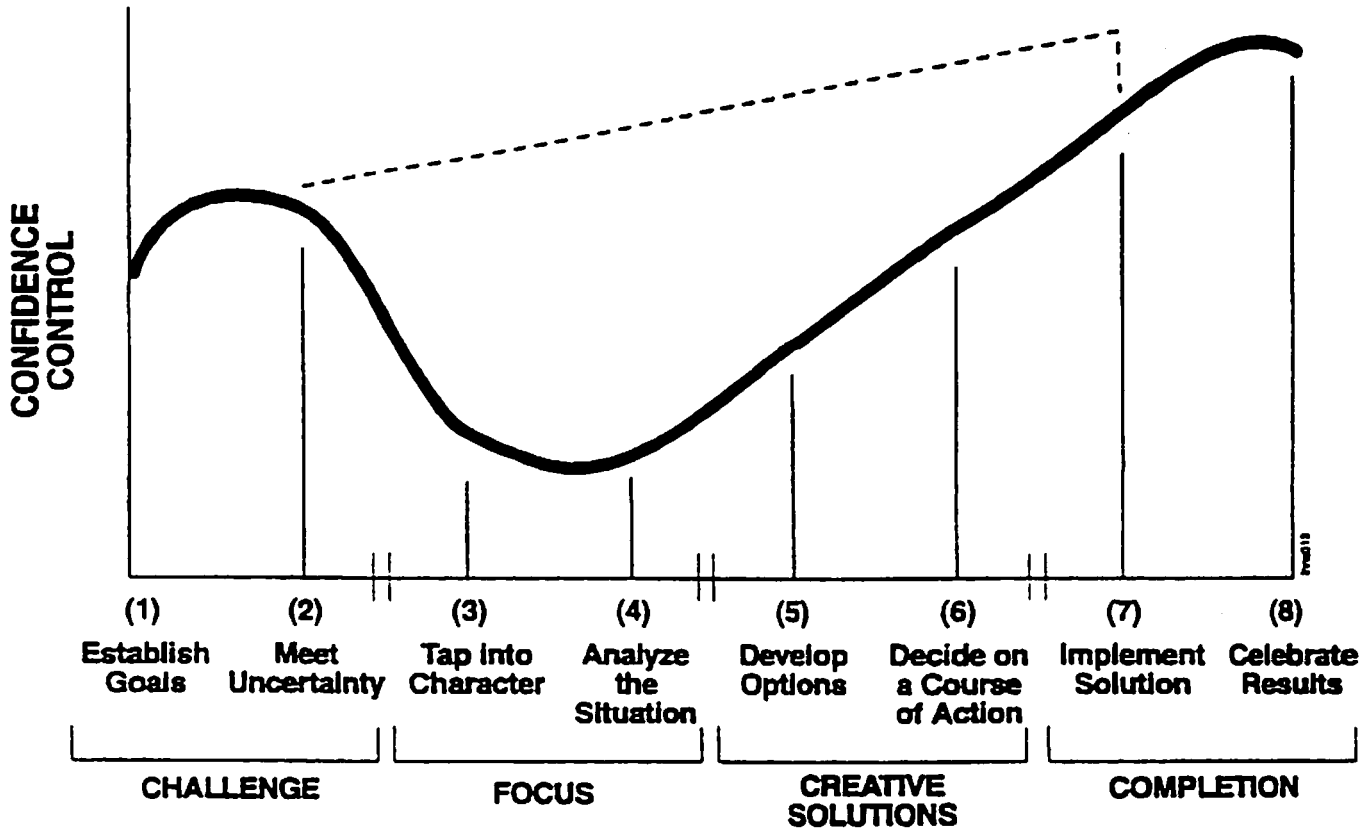
Wish List Item
Specific Ideas

Wish List Item
Specific Ideas

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Confidence and Control Chart



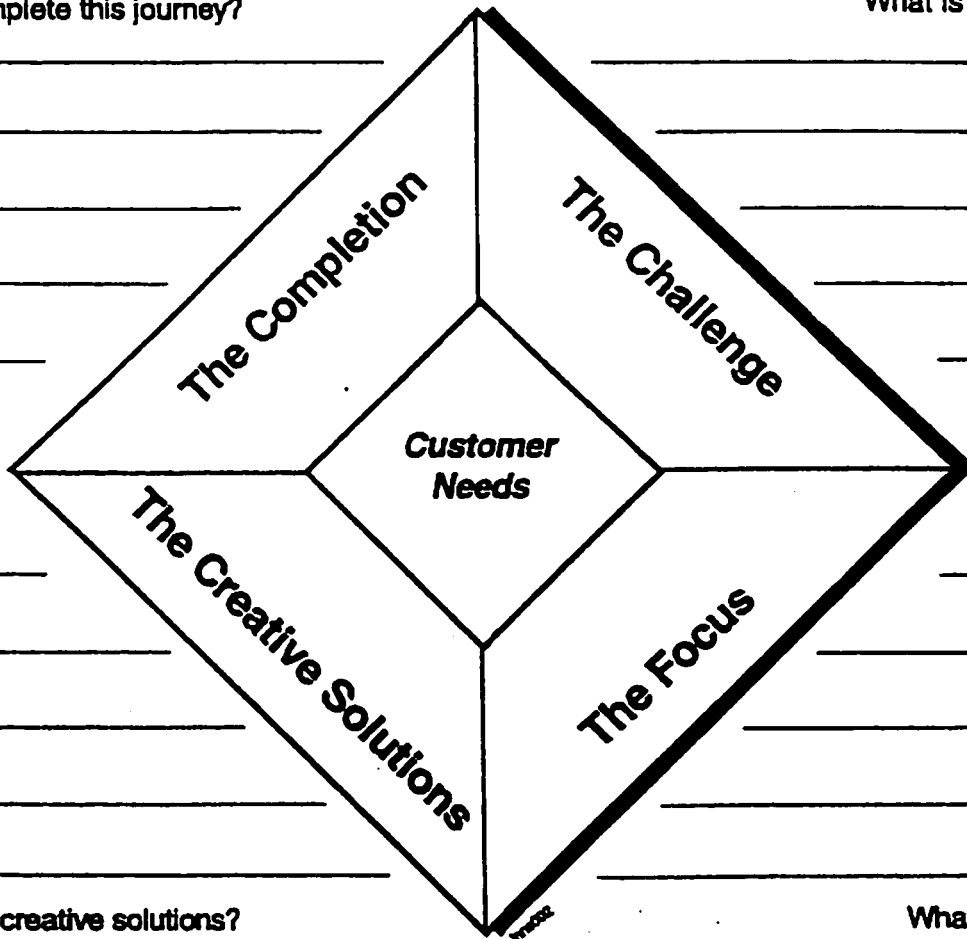

Notes

The Creative Journey Worksheet (Level One)

_____ 

How will I complete this journey?

What is my challenge?



What are my creative solutions?

What do I focus on?



The Creative Journey Worksheet (Level Two)

The Completion

Step 7: Implement Solution

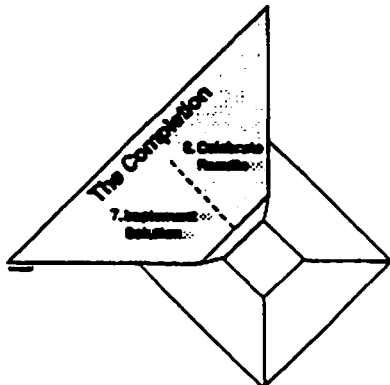
Question: What is the best way to implement our solution with quality?

Solution	Short Term	Long Term
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Step 8: Celebrate Results

Question: What measures and satisfactions give us a sense of accomplishment and learning?

Measures of Success	Satisfaction/Rewards
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



'What if?' game can be of use in making points about issues

Morton Marcus is an economist with the IU School of Business where he serves as director of the Indiana Business Research Center with offices in Bloomington and Indianapolis.



MORTON MARCUS

The "What if?" game can be enjoyed by any number of players without special equipment. It can be played by the ignorant as well as the wise. Experience in life is often an asset, but experience can also stifle the imagination.

You can play "What if?" backwards or forwards in time. You can spin yarns about what could have been or you can imagine alternative futures.

In the retrospective format, "What if?" starts with a question about something that did not happen. What if Eve had resisted the snake's temptation? Would the world be different? What if the Colts hadn't left Baltimore? Would Indiana be any different?

Then, looking forward, you could ask: What if gambling comes to TV? Will riverboat casinos survive? What if Colin Powell decides to become Pope instead of president? Will Bill Clinton support prayer in the schools?

What if we gave up local and state regulation of telecommunications and other utilities? Would those industries function better? This question arises because we are confused about the regulation of cable TV, telephone, and electrical service, and other forms of economic activity.

To get a handle on the issue, we have to ask, What if we had never started to regulate water companies, taxi service, trolley cars, railroads, and other so-called public services? Without regulation, would we have telephones and electricity in our homes today?

We might have seen a less orderly development of those industries and the distribution of their services. There might have been, for a while, costly duplication of services in some densely populated areas. In lightly populated areas there

might have been no service, even to this day. We might have seen the wires of competing telephone companies strung next to each other in the big cities while remote rural areas would have been less attractive places (if we agree that the telephone is an asset).

But we might also have seen more technological advances, more managerial innovations, more imaginative pricing policies, if there had been competition. Out of fear, we gave up competition in favor of regulated monopolies. We thought we could not achieve universal service, stability, and the low user charges without regulation.

For the last 20 years, we have been trying to re-introduce competition into regulated markets. The results are often mixed. Some customers, in some cities, are clearly better off as a result of airline and trucking deregulation.

Competitive telephone services have not filled the air with unsightly wires, but with unbearable commercials and confusing combinations of services.

What should we expect of local and state regulators in the future? Should they be seeking ways to end monopolies and introduce competition, thus ending the need for regulation?

For example, do we need to regulate local cable TV companies? Is there sufficient competition from dish technology that local monopolies no longer exist? And if electric or telephone companies want to provide TV services, should local government have any say in the matter?

We had regulation to protect the public from high monopolistic prices and to extend service to areas where it might not

be offered on economic grounds. Do those conditions still exist? If not, why have local regulation of cable systems?

But what if the TV vendors are selling smut? Should we regulate the products offered to our children? It's like asking, What if clothing stores are selling outfits that make our daughters look like street walkers? Should we regulate dress shops?

And that brings us to another "What if?" What if we sold off the city, any city, to private enterprise? Would we get better services? For example, what if we sold Frankfort to a real estate development company? Would the people of the town be worse off?

The development company could offer a set of municipal services for a fee, just like taxes. We would have streets, garbage collection, fire and police protection (courts and prisons remain in the hands of the county and the state), libraries, schools, parks, street lighting, land use controls ... the works. If we did not like the way the company ran the town, we could move to another town. Simple, right?

That's the way we currently work with our long-distance telephone companies and it is the way we will work with our electric and TV companies in the future. Why not our cities? The current popularity of privatization surely is leading to this. What keeps us from going the distance, openly and honestly, instead of with stealth, step by step?

Office parks, industrial complexes, shopping centers, and many residential developments already offer some municipal services. What if we privatized our cities in full? Would Indiana get a reputation for innovation or for self-deception?

What if Indiana had a reputation for innovation...ah, but "What if" becomes such a silly game after a while.

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TRENDS



By Jennifer J. Salopek

Improvisation

When most of us think of *improvisation*, the term brings to mind stand-up comedy and TV shows like "Whose Line Is It Anyway?" Although comedians do use improvisation, it's not strictly their purview. It can be put to use for more serious pursuits, and those who use it for training find it extremely effective.

Alain Rostain discovered improvisation in 1991, while working as a consultant for PricewaterhouseCoopers. He immediately recognized its implications for business and began taking classes to become more adept. In 1993, he left to form Creative Advantage, a New York-based consultancy. Early on, he used improvisation as a tool for creativity and brainstorming; now, CA offers a full suite of innovation services. Rostain emphasizes that improvisation is a tool: "Our clients don't buy improv; they buy solutions."

Some of those clients include Kraft, Starbucks, GE, R.J. Reynolds, and Blockbuster, which hire CA to work on projects ranging from reducing costs in a product category to training new managers in conducting difficult conversations.

"Improv in business is exploding. It is a powerful tool that had to overcome the idea that it's some kind of metaphor, or that it's frivolous. Improvisation is about real people doing stuff in the moment," Rostain explains.

Effective improvisation embraces several basic concepts:

- Pay attention and be present.
- Make your partner look good.
- Don't censor yourself.
- Say, "Yes, and..." instead of "Yes, but..."
- Listen generously.
- Take risks and embrace failure.
- Say the obvious thing—in other

words, the first thing that comes to mind. There are no wrong answers.

Many of those concepts are the same ones that govern productive brainstorming. But why is improvisation so effective in training?

"The most fundamental skill in improv is listening," says Rostain. "People are pretty poor at it in general. Improv forces you to focus on what the other person is saying. It makes people very present."

One enthusiastic convert is Janet Bezmen, associate executive director of psychiatric nursing at Elmhurst Hospital Center in Elmhurst, New York. She took an improv workshop at New York-based Performance of A Lifetime several years ago: "It was a life-altering experience; it was amazing," she says. She has since sent staff to train-the-trainer courses and has worked with POAL to help her staff find more creative approaches to patient care.

◀ www.performanceofalifetime.com

Performance of A Lifetime president and CEO, Cathy Salit, originally founded the company as a personal-growth center and school. She entered the corporate training arena when her students began begging her to tailor programs for their workplaces.

"At first, I really thought it was too out there," she says. "And my colleagues and I were purists; we were reluctant to take our work and fit it into the mold of what companies wanted people to get better at. I thought it would corrupt the experience if we were trying to serve very specific outcomes."

Salit's first incursion into corporate training was a teambuilding program for Thomson Financial Services. Since then, she says, "Our clients have met us halfway and have become our strategic

Not Just
Funny Business

partners. We leave room for unexpected learnings."

That suits Salit just fine. A junior-high dropout, she describes herself as someone who has "always sought out alternative forms of education and learning." She pursued a successful career as a professional actor and singer before forming POAL in 1996.

When beginning a client engagement, Salit doesn't perform a classic needs assessment. She meets with stakeholders to try to understand their language and their issues, then she and her staff create customized scenarios for the improv exercises. However, she's careful always to use a different industry or business type in the scenarios. "Participants need to work on their skills without being overwhelmed with the technicalities of their own situation," she says. In other words, if scenarios were too close to real life, participants might start talking about last week's meeting or next week's product launch and veer away from the issues at hand.

Rostain takes a similar approach. When working on the topic of difficult conversation with new managers recently, he had participants suggest situations that presented challenges for them. "We don't use a preplanned case study," he says. "We model situations live. It's more than a role play; it's a real play, made up on the fly." Using improv to teach improv also provides valuable lessons: "We model making mistakes. The learning takes best when people are willing to take risks and make mistakes."

Rostain reports that improvisation techniques are now being used in training around corporate values and ethics. Improv's emphasis on participation and storytelling means that "participants internalize those values; they're not meaningless," he says.

Salit has used improvisation to provide training on many common workplace issues, such as teamwork, creativity, diver-

sity, corporate culture, and leadership development. She believes improv is effective in those areas because "they're all about using language.

"Improv is something that we are all able to do," she continues. "We are all performers. We try to show people that they have more choices. Everything participants put into a scene is accepted in creating something together. It is not transactional or competitive."

That acceptance of all offered ideas is crucial. The concept of "Yes, and..." is one that anyone could use to make training sessions more effective. Salit explains further: "By saying *yes, and...*, you accept what the other person has said, then add a little bit. You are building a conversation instead of just adding information.

"It's more than a role play; it's a real play, made up on the fly." Using improv to teach improv also provides valuable lessons....
"The learning takes best when people are willing to take risks and make mistakes."

People often think that what's most important is that you say what you have to say, regardless of whether anyone is listening—then you can check it off your list. But improv—and training generally—is a how-to process."

Improvisation in business is quickly gaining ground and credibility. Performance of A Lifetime partners with Duke Corporation Education (recently named the number 1 program in the United States by *Business Week* and *Financial Times*) to design its experiential learning offerings. Scholars at such prestigious institutions as the Richard Ivey School of Business in Toronto, are

doing research on improv, as well as using it in their own teaching.

Mary Crossan, a professor at Ivey, writes: *We extended our research in organizational learning and strategic renewal in order to investigate what it takes to improvise and how it differs from more traditional approaches. We studied improvisation, working with [The] Second City [Improvitational Company, of Chicago] to understand more about the craft. Soon the Ivey Business School and Second City were working together to provide the skills of improvisation to Ivey students and the business community.*

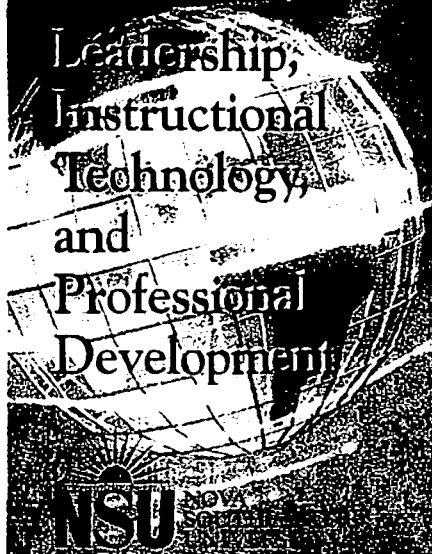
We discovered that not only does improvisation provide a way to understand what it takes to be spontaneous and innovative, but also that exercises used by

actors to develop their skill can be adopted by business as a means to experience and enhance individual and organizational capacity to be innovative and responsive.

Elmhurst Hospital's Bezmen is a living example of the truth of those words: She says that learning improv radically changed her management style. "I was very into knowing and control. Now, I feel as though I can give people options and build on what they're saying to me. The learning opportunity was a gift. I feel much closer to my staff."

Improvisation is also gaining credibility in the business world by organizing itself. Rostain is one of the founding

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TRENDS

members of the Association for the Advancement of Improvisation in Business, a group designed to share best practices and document how improv is creating value. In his vision statement for the organization, he wrote, "Until very recently, only a few people were applying improv to business. In the past year, however, most training, leadership, and learning conferences have included improv presentations. I've also noticed a growing number of improv practitioners at these events. But we have yet to come together as a large community.... I need to be with people who do what I do. If we don't share it, we won't grow."

<<www.improvinbiz.org

For trainers who are interested in incorporating improv techniques in their own work, Rostain notes that most of the exercises are in the public domain. The AAIB Website offers a wealth of articles on everything from theory to activities and exercises. Creative Advantage sells a card deck called "Juicers" that shows you how to conduct 36 activities. Rostain also recommends *58-1/2 Ways to Improve in Training: Improvisation Games and Activities for Workshops, Courses, and Team Meetings*, by Paul Z. Jackson. And, of course, you can attend AAIB's annual conference, to be held October 13-16, 2004, in San Francisco.

"There's a real need for new approaches, and it's growing by the hour," concludes Salit. "People are experiencing death by PowerPoint. They're open to improvisation, but we have to educate them, articulating learning objectives and so forth. We're teaching as opposed to selling."

Jennifer J. Salopek is contributing editor to T+D; jsalopek@convad.net.

strength

The quality of being strong

Not something made in a day

What a wish gives a child who is sick

If you know a child with a life-threatening illness, please call 1-800-722-WISH or visit www.wish.org. **MAKE A WISH**

What's The Big Idea?

Today's training professionals have probably never had a tougher economic time than today's business climate. We are challenged to develop high-quality training programs with fewer resources in order to deliver a more quantifiable return on investment. But this chaotic time also gives us an opportunity for innovation and creative problem solving. Most of us tend to look for that one big idea. However, by constantly creating a large quantity of ideas, we can net the one elusive big idea. From this, we can develop a customized solution, product, strategy or action plan.

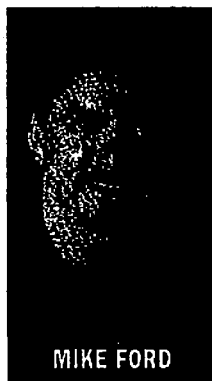
In this frenetic world where we seek immediate satisfaction, there is fortunately a tried-and-true repeatable process to provoke creativity and imaginative change. The Creative Problem Solving (CPS) process—developed more than 50 years ago by educator Sid Parnes and Alex Osborn, founder and partner of BBDO, a global advertising agency headquartered in New York—has been applied to everything from “where should we go for dinner tonight?” to “how do we resolve the apartheid issues in South Africa?” A learning organization that trains its people in CPS reaps many benefits. Using this process will provide a simple, repeatable process for groups (and individuals) to generate effective, even breakthrough, solutions. It will develop everyone's innate creative talents and tap employees' creativity, which empowers them to solve problems, be accountable and work as a team. Best of all, it will enable a company to move from imitation to origination.

Want to ignite creativity and imaginative change in your training programs? Try this:

1. Blow it up. When you think you have achieved a fair level of success with your program, it is time to recreate it. Pablo Picasso once said, “Every act of creation begins with an act of destruction.” Look at your programs and destroy them from the inside out. Imagine the possibilities of a new, bold and totally off-the-hook approach to experiential learning for your trainees.

2. Promote playtime. Adult learners are more self-directed and must take control of their own learning. Because of their life experiences, they are more goal-oriented, practical problem solvers. While many companies reward such behavior, it should be

LOOK AT YOUR
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IMAGINE THE
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TO EXPERIENTIAL
LEARNING FOR
YOUR TRAINEES.



MIKE FORD

balanced by reverting back to child-like thinking. This will elicit more creativity. Bringing out adults' playfulness during idea generation produces more successful solutions. Then get them to be adults again and make appropriate choices from their action list.

3. Add edu-tainment. In a world where people suffer from information and advertising overload and attention spans are measured in microseconds, comprehension and retention are achieved only through dynamic edu-tainment—a multi-sensory marriage between education and entertainment. To reach its full potential, the subject matter must be engaging and relatable or it's a waste of time for both the learner and the teacher. This is a lesson often missed in e-learning.

Using multimedia to create engaging training is relatively easy. Keeping it relevant is the real challenge. Unrelated fun doesn't effectively achieve the ultimate goal of having adult learners comprehend and retain the desired key learning.

4. Do it in style. Many training professionals ignore the impact of well-designed materials and visuals for their meetings and workshops, whether it is an e-learning module, PowerPoint presentation, workbook, poster or handout. Make it stylish and visually appealing to your learner. How might you make it appeal to visual, auditory or kinesthetic learning modalities? Apply some feng shui to your space. Get out of your boring training room and trade spaces for a more exciting learning environment.

5. Just do it. Subscribe to the ideology that action beats the pants off sitting around and thinking about action.

6. Go to the Creative Education Foundation's 50th Annual Creative Problem Solving Institute (CPSI)—started by Osborn and Parnes. If you want to learn to risk, to question, to collaborate and to celebrate the creative spirit, consider celebrating 50 years of teaching deliberate creativity at CPSI 2004, June 20-25, in Buffalo, N.Y.

MIKE FORD is director of coaching for Clear Channel University, the corporate training division of Clear Channel Worldwide, San Antonio. For more information about CPSI, go to www.cpsiconference.com.

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The brains behind creativity

Updated 8/27/2006 10:04 PM ET

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 Enlarge

AP

Creative genius at work Vincent Van Gogh's brilliantly done *Sunflowers*

How does the human brain create an evocative haiku, a beautiful painting, a sculpture or even a delicious new dinner?

Neuroscientist Nancy Andreasen tackles that question in her book to be released this fall in paperback: *The Creating Brain: The Neuroscience of Genius*.

HOW TO BE A CREATIVE GENIUS: Tips on giving your mind a workout

And who better to take on that topic than Andreasen, a psychiatrist who started her career with a Ph.D. not in neuroscience but in Renaissance literature?

USA TODAY's Kathleen Fackelmann talks to Andreasen about the muse, the link between genius and madness and the part of the brain that kicks in during the creative process.

Q: What is creativity?

A: The process starts with a person — an artist, musician, inventor or even someone who's trying to figure out a better way of doing a task at work or at home. That person must think about the problem or their project in a novel way and then come up with a solution. The creative process can go by in a flash or it can take years. But the end result, Andreasen says, is the production of something new and useful, such as the automobile, or beautiful, such as a painting by Vincent van Gogh.

Q: Do genes set a creative genius apart?

A: No one knows yet if the ability to produce a haunting symphony is a divine gift, the result of the environment or a genetic makeup that allows people to tap more easily into the creative process. Creativity does seem to run in certain families: For example, Johann Sebastian Bach was the most famous member of the Bach family, but there were 20 other eminent musicians who hailed from the same family, Andreasen says.

Q: What is ordinary creativity?

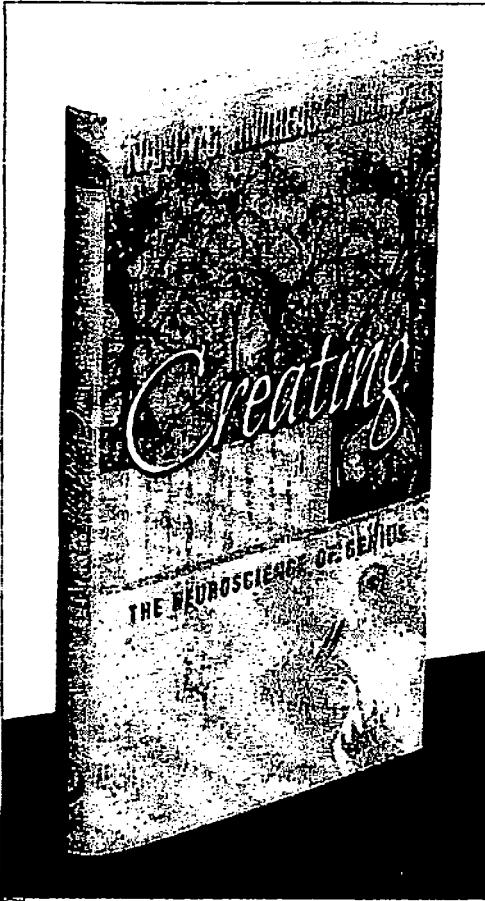
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[Enlarge](#)

Her book is out; she's speaking out

The Creating Brain: The Neuroscience of Genius is out in hardcover now (Dana Press, \$23.95). The paperback version arrives Oct. 30 (Plume, \$15).

To learn more: Nancy Andreasen is scheduled to give the keynote lecture this September in Japan at an annual meeting of biological psychiatrists, and in November she'll give a talk for the general public at the Smithsonian in Washington.

Q: Does the environment play a role in the creative process?

A: There have been hotbeds of creativity throughout history. For example, the city of Florence during the Renaissance period was home to both Leonardo da Vinci and Michelangelo. Both men came from families that didn't especially value creativity, yet someone noticed a spark of talent and both got the training and financial backing to produce extraordinary pieces of art.

How to give your mind a workout

So you say you're no Michelangelo. Nancy Andreasen, a neuroscientist at the University of Iowa Carver College of Medicine, says you can build a better, more creative brain. How? Spend 30 minutes a day on a creativity workout. She suggests:

A: Creativity is not limited to the masterpiece work of art but can be found in everyday tasks such as cooking or gardening, Andreasen says. A cook who changes a recipe or even makes one up using ingredients he or she has on hand is using the creative process to create novel taste sensations. A gardener who picks out colors and a pattern for a flower garden also is tapping into his or her creative potential, she says.

Q: Describe the creative process.

A: Artists, musicians and writers often describe periods during which they're relying on ordinary creativity, Andreasen says. For example, writers can spend hours at the keyboard stringing thoughts together — the process is similar to the way people put together novel ideas when talking. But many great artists also describe a dream-like state during which a symphony, a poem or the idea for the ending of a play comes to them in a flash.

Q: What's going on in the brain during a flash of inspiration?

A: No one knows for sure, but Andreasen says her research suggests that creative people often slip into a zone in which ideas and thoughts come up freely in a disorganized way. During that state, she says, a part of the brain known as the association cortex becomes very active. That brain region is known to be able to link up ideas or thoughts in potentially novel ways.

Q: What is the relationship between creativity and mental illness?

A: Folk wisdom has held that gifted people are prone to mental breakdowns. And in fact, there's a long list of artists, musicians, mathematicians and others who had well-known episodes of mental illness. For example, van Gogh had periods of mania and depression; he committed suicide at age 37. Andreasen's study of people attending the University of Iowa's Writers' Workshop found that many had a history of depression or bipolar disorder. Andreasen says mental illness is, on the whole, a handicap to the creative process.

Q: Is there a creative personality?

A: Gifted people in the arts or science tend to enjoy adventure, and they often like to explore new places or ideas, Andreasen says. They don't like being hemmed in by rules or convention and often look at problems from a different angle. They also tend to have a high tolerance for situations defined by shades of gray. They often have to move doggedly ahead on a project — even when the outside world rejects their art or new ideas.

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happens

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•Explore an unfamiliar area of knowledge. For example, people who use a lot of math on the job should sign up for a painting class.

•Spend time each day thinking. Don't censor your thoughts, but allow your mind to go freely to a problem and see what kinds of solutions or ideas surface.

•Practice the art of paying attention. Look for and really observe a person, an object or something in your daily commute that you hadn't really noticed before. Try describing or drawing that object in a journal or sketchbook.

•Use your imagination. Spend time each day imagining a different world. What would it look like? What would you do there?

To nurture creativity in children

•Read with your child every day. Make sure reading becomes an active experience in which you ask questions and point out new concepts to your child.

•Emphasize diverse topics of study. Make sure your child is exposed to both the arts and sciences.

•Encourage curiosity. Ask children interesting questions and get them to look around and think about the world in novel ways.

•Get children interested in music. Studies have shown that musicians have more gray matter than non-musicians. Children can listen to music while doing another activity, such as playing.

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PREOCCUPATIONS

The Google Way: Give Engineers Room

By BHARAT MEHRATTA, THE NEW YORK TIMES BOOK REVIEWER
Published: October 27, 2007

GOOGLE engineers are encouraged to take 20 percent of their time to work on something company-related that interests them personally. This means that if you have a great idea, you always have time to run with it.

E-MAIL
PRINT
SAVE
SHARE



Mr. Meheratta, a New York Times Book Reviewer, is taking part in a grouplet meeting at Google reflecting its emphasis on allowing employees time for independent projects.

It sounds obvious, but people work better when they're involved in something they're passionate about, and many cool technologies have their origins in 20 percent time, including Gmail, Google News and even the Google shuttle buses that bring people to work at the company's headquarters in Mountain View, Calif.

If your 20 percent idea is a new product, it's usually pretty easy to just find a few like-minded people and start coding away. But when the thing you really want to work on is to make a broad change across the whole organization, you need something new — you need a "grouplet."

These grouplets have practically no budget, and they have no decision-making authority. What they have is a bunch of people who are committed to an idea and willing to work to convince the rest of the company to adopt it.

Consider the collection of engineers who wanted to promote "agile programming" inside the company. Agile programming is a product development approach that incorporates feedback early and often, and was being done in a few scattered parts of the organization.

The Agile grouplet formed to try to take this idea and spread it throughout the organization. It did so by banding together and reaching out to as many groups as it could to teach the new process. It created "Agile Office Hours" when you could stop by and ask questions about the process. It handed out books and gave internal talks on the topic. It attended staff meetings and created the concept of the "Agile Safari," in which you could volunteer to work for a time in groups that were using Agile, to see how it ticks.

When you're moving as fast as Google is, you don't always get the chance to button up the little things, and over time they build up and become annoying. In addition to the efforts of our professional quality assurance team, we have the Fixit grouplet, which coordinates special Fixit days when it tries to have our engineers focus on solving one class of problems. Sometimes we have Documentation Fixits, when we try to catch up on all the internal documentation that we have let slide.

Or my favorite: the Customer Happiness Fixit, when we fix all those little things that bug our users and make them sad — for example, when the hotkeys aren't just right on mobile

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- 10. Mind: The New Year's Cocktail: Regret With a Dash of Bitters

Go to Complete List »

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phones. Many of these events come with special T-shirts and gifts to reward the engineers who take a little time out to work on them.

In my 20 percent time, I started the Testing grouplet. This was born of the idea — not mine — that if developers wrote automated tests as they wrote their code, their code would be better for it. Less time fixing bugs means more time building stuff.

We started with engineers from all over the company meeting every couple of weeks to brainstorm. Slowly, over time, we started turning into activists, planning to actually start improving things.

We started building better tools and giving informal talks to different technical groups. We started building a curriculum for our Nooglers — newly hired Google employees — so that they would start off right. With our pooled 20 percent time, we slowly turned the organization on its axis and made developer testing a common part of the development practice.

Google works from the bottom up. If you have a great technical idea, you don't have your V.P. send out a memo telling everybody to use it. Instead, you take it to your fellow engineers and convince them that it's good. Good ideas spread fast, and this approach keeps us from making technical mistakes. But it also means that the burden falls upon you to spread your idea.

In the Testing grouplet, our idea was to have developers start writing their own tests. But no matter how hard we tried, we weren't reaching engineers fast enough in our growing organization. One day, toward the end of a long brainstorming meeting, we came up with the idea of putting up little one-page stories, called episodes, in bathroom stalls discussing new and interesting testing techniques. Somebody immediately called it "Testing on the Toilet," and the idea stuck.

We formed a team of editors, encouraged authors to write lots of episodes and then bribed Nooglers with books and T-shirts to put up episodes every week. The first few episodes touched off a flurry of feedback from all corners of the campus. We received praise and flames, but mostly what we heard was that people were bored and wanted us to hurry and publish the next episode.

Eventually, the idea became part of the company culture and even a company joke, as in, "Excuse me, I need to go read about testing." That's when we realized that we had what we needed: a way to get our message out.

Of course, the grouplets need guidance to make sure they are aligned with the company interest. Having a lot of people who are self-organizing can be powerfully positive or negative, and not every idea is a good one. To help deal with that, a number of grouplet organizers meet once a week to make sure they are not at cross-purposes.

But when you give engineers the chance to apply their passion to their company, they can do amazing things.

Bharat Mediratta is a software engineer at Google.

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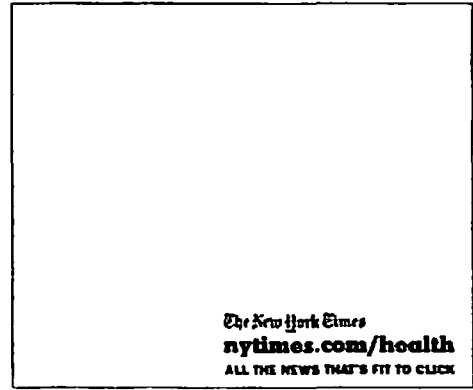
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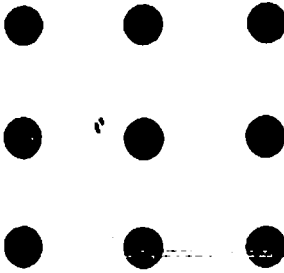
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The Nine-Dot Problem:
Connect 9 dots
with a series
of 4 lines
without lifting
your pencil
off the
page.

FIGURE 3-1



Robert J. Stenberg, *Intelligence Applied*

1986

55

Davis (1992)

Davis (1992)

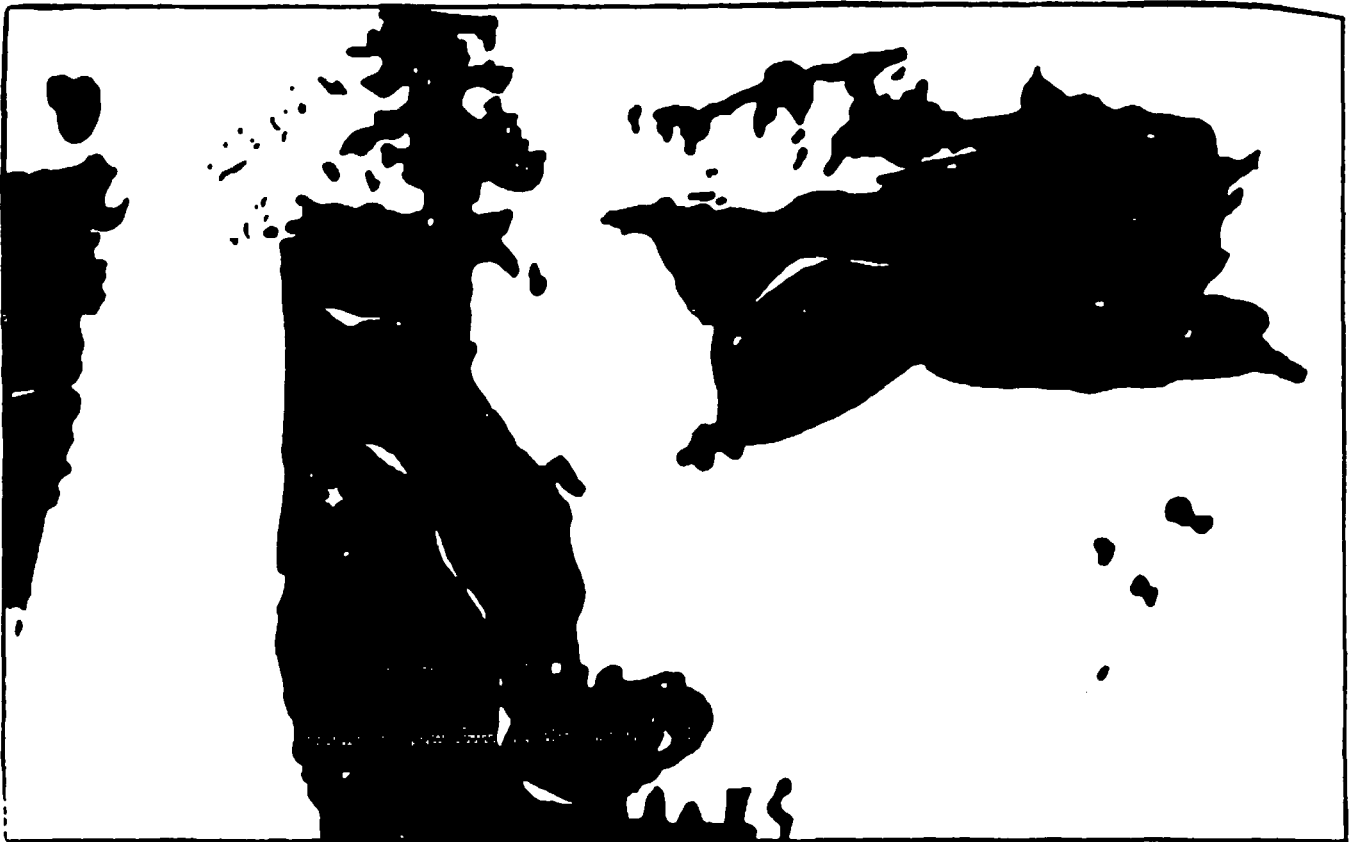
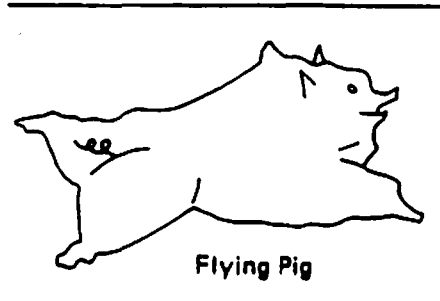
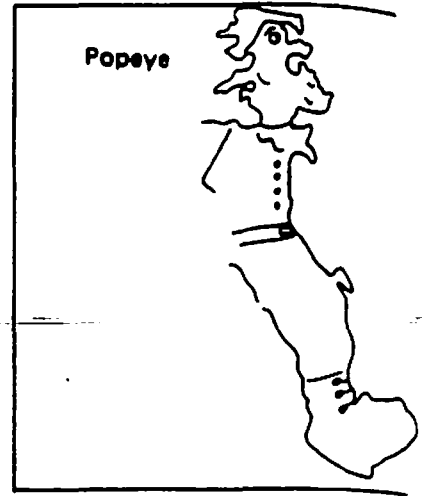


Figure 5.4. Mysterious picture. Can you find the one main picture? Ten other meaningful pictures? What else can you see? (Sidney J. Parnes, Ruth B. Noller and Angelo Biondi, excerpted from *Guide to Creative Action*. Copyright © 1976 Charles Scribner's Sons. Reprinted with the permission of Charles Scribner's Sons.)

Solutions to Visual Puzzle.

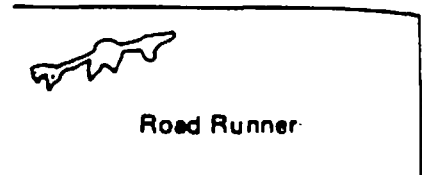
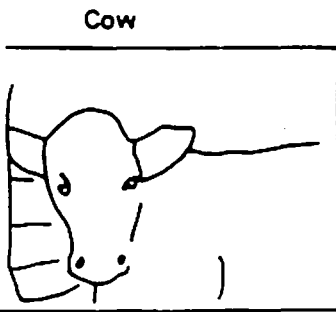


Flying Pig

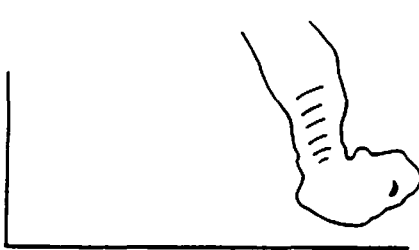


Popeye

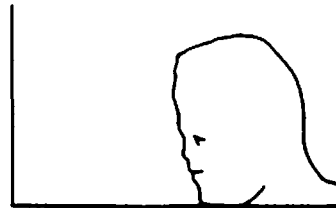
Dog Patch Person



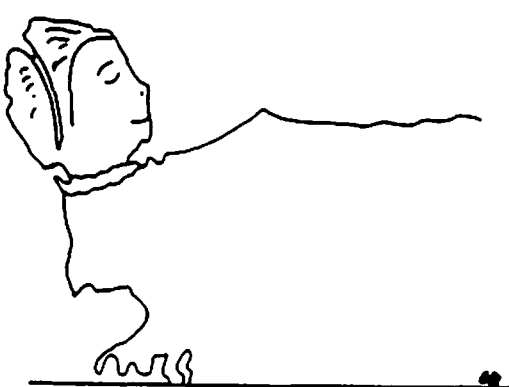
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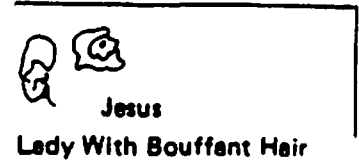
E.T.



Harry Belafonte



Napping Lady



Jesus

Lady With Bouffant Hair



Blackbeard

Part 1. Concealed Colors...The name of what color is concealed in each statement?

Examples: Newspaper editors decided to go strike.

The cab lacked the proper brakes to stop at the intersection.

Now try these:

1. The big, old hungry dog appeared at our door every morning.
2. The cop persuaded him not to create a disturbance.
3. The Brazilian student Paulo lives just around the corner from us.
4. You shouldn't let an upstart like him bother you.
5. He let out a big yell, owing to the injuries he received when he fell.
6. La Jolla vendors decided to cut their prices in half.
7. Long rayon fabrics were loaded on the truck.
8. You shouldn't sell this fossil very cheaply because it is a rare specimen.
9. The new law hit everybody's pocketbook pretty hard.
10. No one thought of awnings to protect the merchandise from the sun.
11. A huge dog called Lqbo ran gently toward me.
12. The kitten chased the big pear lying near the tree.

Part 2: Problems/Equations...Each of the following problems can be solved by substituting appropriate words for the letters. Have fun with them!

Examples: 3F. = 1Y (3 Feet = 1 Yard)

4L.C. = G.L. (4 Leaf Clover = Good Luck)

Now try these:

1. M. + M. + N.H. + V. + C. + R.I. = N.E.
2. "1B. in the H. = 2 in the B."
3. 8D. - 24H. = 1W.
4. 3P. = 6
5. T. = L.S. State
6. 23Y. - 3Y. = 2D.
7. A. & E. were in the G. of E.
8. My F.L. and South P. are both M.C.
9. H.H. & M.H. at 12 = N. or M.
10. S. + H. of R. = U.S.C.
11. 4J. + 4Q. + 4K. = All the F.C.
12. "R. = R. = R."
13. C. + 6D. = N.Y.E.

Part III. Sounds/Patterns

Turn over this sheet and listen to the instructor read the following phrase.

FINISHED FILES ARE THE RE-
SULT OF YEARS OF SCIENTIF-
IC STUDY COMBINED WITH THE
EXPERIENCE OF MANY YEARS

Blank Page 233

Imagery and Mnemonic Chains

(Covert Operants)

1. Imagine you have a tablecloth spread out on the floor and on it is an elegant set of DINNERWARE.
2. Stuck right in the middle of it is a huge four-foot fountain PEN.
3. The other end of the pen is jammed into the belly of a JERSEY cow, which is rocking back and forth.
4. On the top of the Jersey cow is King GEORGE in all his regalia.
5. King George has a cut on his forehead and there is a band-aid CONNECTING the two sides of the CUT.
6. Now, King George has his hands uplifted and is holding on his shoulders a tremendous MASS of ice.
7. On the top of the ice sits Marcus Welby freezing his rear end. On his white coat is a badge that reads MD.
8. Marcus Welby is holding his hands in front of him, and in them he has an old-fashioned train, called a CAR LINER, which is going SOUTH.
9. Stuffed in the top of the car liner's smokestack is a NEW HAM (one of those juicy registered ones).
10. The ham is wrapped in a piece of sheet music entitled "Carry Me Back to Old VIRGINY."
corner
11. In the upper right-hand/of the sheet music is a picture of the EMPIRE STATE BUILDING.
12. On top of the Empire State Building is another CAR LINER, but this one is going NORTH.
13. Finally, on top of the car liner, standing right on the smoke-stack and getting ready to lay an egg, is a big RED HEN--a RHODE ISLAND red hen, as a matter of fact.

LIST 1--Original Colonies
in order

1. Delaware
2. Pennsylvania
3. New Jersey
4. Georgia
5. Connecticut
6. Massachusetts
7. Maryland
8. South Carolina
9. New Hampshire
10. Virginia
11. New York
12. North Carolina
13. Rhode Island

LIST 2--Fewest Vocational Rehabs.
in order

1. Nevada
2. Wyoming
3. New Hampshire
4. Vermont
5. Idaho
6. South Dakota
7. Utah
8. Montana
9. Nebraska
10. Washington
11. Rhode Island
12. Oregon
13. North Dakota

SIX THINKING HATS

The Six Thinking Hat system is a simple and practical way to separate the different modes of thinking. There are six hats, each of a different color. Each hat represents one mode of thinking. A thinker may be asked to put on a hat of a certain color or to take off a hat of a certain color. A thinker may also indicate that he or she is choosing to put on a particular hat.

Note that the hat metaphor is carefully chosen because hats can easily be put on or taken off. The six hats do not represent personalities or types of thinker. Everyone is required to attempt to use all the hats.

White Hat: Think of white paper or a computer print-out. White hat thinking is a request to focus directly and exclusively on the information base.

Red Hat: Think of red for fire and warmth. Red hat thinking deals with emotions, feelings, hunches and intuitions.

Black Hat: Think of a black line that crosses something out. The black hat is probably the most valuable hat in the end because it is the judgment hat, and it prevents us from carrying out things that are stupid or dangerous.

Yellow Hat: Think of sunshine and optimism for the yellow hat represents the "logical positive." Wearing the yellow hat we look for the feasibility of a project, the profitability, the added value. Nevertheless, we must give logical reasons to support our statements. The yellow hat represents the logical positive and not just hope or wishful thinking.

Green Hat: Think of green vegetation, of growth and of energy, for the green hat is the creative hat. The green hat is a specific request for creative thinking, a specific request for proposals, alternatives, new ideas and even provocations.

Blue Hat: Think of calm blue sky that overlooks everything for the blue hat is the overview or process control hat. While the others hats are thinking about the subject matter, the blue hat is looking at the "thinking" that is taking place. Like the conductor of an orchestra, the blue hat asks for the other hats or different thinking operation.

De Bono's Thinking Hats

Six hats of critical thinking ...

In his book, *Six Thinking Hats*, **Edward deBono** asks you to imagine six coloured hats. Each hat represents a role your mind plays in the critical thinking process. By switching from one hat to another as you think about your topic, you are forced to look at your topic from a variety of perspectives.

For the exercise, start with six sheets of paper - one for each hat. Select a topic or problem that you would like to think about or work on. Decide which of the hats would be good to start with and work your way through all six, jotting down notes on the thoughts that come to you with each hat. The table below identifies the six hats, their characteristics and some of the questions you should ask with each one. You may think of other questions as well. If you have worked a problem through all six hats and have jotted down at least three points for each, you will know that you've covered the major points in the critical thinking process!

Hat	Characteristics	Questions
White hat:	<ul style="list-style-type: none"> Used to think about facts, figures, and other objective information (think of a scientist's white lab smock). 	<ul style="list-style-type: none"> What facts would help me further in making a decision? How can I get those facts?
Red hat:	<ul style="list-style-type: none"> Used to elicit the feelings, emotions, and other nonrational but potentially valuable senses, such as hunches and intuition (think of a red heart). 	<ul style="list-style-type: none"> How do I really feel? What is my gut feeling about this problem?
Black hat:	<ul style="list-style-type: none"> Used to discover why some ideas will not work, this hat inspires logical negative arguments (think of a devil's advocate or judge robed in black). 	<ul style="list-style-type: none"> What are the possible downside risks and problems? What is the worst-case scenario?
Yellow hat:	<ul style="list-style-type: none"> Used to obtain the positive outlook, this hat sees opportunities, possibilities and benefits (think of the warming sun). 	<ul style="list-style-type: none"> What are the advantages? What would be the best possible outcome?
Green hat:	<ul style="list-style-type: none"> Used to find creative new ideas (think of new shoots sprouting from seeds). 	<ul style="list-style-type: none"> What completely new, fresh, innovative approaches can I generate? What creative ideas can I dream up to help me see the problem in a new way?
Blue hat:	<ul style="list-style-type: none"> Used as a master hat to control the thinking process (think of the overarching sky, or a "cool" character who's in control). 	<ul style="list-style-type: none"> Review my thoughts. Sum up what I've learned and think about what the next logical step is

(<http://library.usask.ca/ustudy/critical/sixhats.html>)

Humor Corner

by David Eastman

By now, we're all probably familiar with Edward deBono's "Six Thinking Hats" technique where you wear six different colored caps to signify exploring a problem from six different perspectives. Less well-known is deBono's "Six Action Shoes" he added to the theory in 1991, featuring gumboots, brogues, slippers, and a few others to represent how to take action on those creative insights (hey, I'm not making this stuff up)!

While these are truly valuable tools for trainers, clearly another update is due for the toolbox. Voila! Enter, stage left, the recently invented, patent pending, politically incorrect SIX UNDERWEAR THINKING, referred to in the vernacular as the "Six U-Trou" method.

The next time your organization really needs to get to the bottom of a problem, try this inspiring experiential approach. For maximum impact, of course, you should actually bring the following pairs of undergarments to the group and slip them on and off while you take each perspective:

- 1) **BOXERS** — stability and tradition personified. Ask, "How have you traditionally solved these types of problems?" Look at historical precedents and time-honored procedures. How would your Dad solve this problem? Figure out what doesn't work.
- 2) **BRIEFS** — stated briefly, what is the problem? No bystuff overproblem-solving to get the bottom of an issue buzz words and mumbo jumbo. These aren't legal briefs, just a short, basic, no nonsense summary of the matter at hand.
- 3) **DEPENDS**™ — contingency planning. What would happen if news of this situation leaks out? Will there be any trickle-down effects? How can we guard ourselves against embarrassment while still lining our pockets when necessary? What urgent and unexpected pressure have we not accounted for?
- 4) **GIRDLE** — gird your loins for battle! Who will you have to fight to push a solution through? How much will you have to "suck it up" through cost-cutting and longer work hours? Where is the hidden fat in your organization?
- 5) **THONG** — be bold! You're about ready to crack this problem wide open! What can you uncover that's previously been hidden? What can we do to make this



problem sexy? How can we get people attracted to the problem so that they want to solve it? What kind of "sunscreen" (extra protection) might you need in order to cover your backside if it all falls through?

- 6) **COMMANDO** — the Emperor's New Underwear! Commando lets it all hang out in the time-honored tradition of Tarzan, Sharon Stone, Scottish Kilts, and Joey from the cast of "Friends." Throw out the baby, the bathwater, the underwear, and the problem. Start from scratch! What would you naturally want to do in this situation? Put it behind you and move on.

There you have it: a highly interactive, not-for-the-timid, whole body approach to problem solving — SIX U-TROU thinking! Look for the CD-ROM and Virtual Reality options coming soon to a training supply store near you.

David Eastman has been an academic advisor, bookstore owner, career consultant, lifeguard, psychotherapist, shoe salesman, and the guy who ran the drive-up window at Taco Bell. Currently he presides over Productive Solutions, an intergalactic training and development consortium headquartered in Bloomington.



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HEMISPHERICITY

LEFT (Analytic)

1. Verbal
2. Responds to word meaning
3. Recalls facts, dates
4. Sequential
5. Processes information linearly
6. Responds to logical appeal
7. Trusts logical appeal
8. Looks tidy, organized
9. Plans ahead
10. Punctual
11. Reflective
12. Recalls people's names
13. Speaks with few gestures

RIGHT (Global)

1. Visual, tactual, kinesthetic
2. Responds to word pitch, feeling
3. Recalls images, patterns
4. Random
5. Processes information in chunks
6. Responds to emotional appeal
7. Trusts intuition
8. Looks disorganized
9. Spontaneous
10. Less punctual
11. Impulsive
12. Recalls people's faces
13. Gestures when speaking

Lateral Thinking

Edward de Bono writes in "Serious Creativity", how he became interested in the sort of thinking that computers could not do: creative and perceptual thinking. The entry in the Concise Oxford Dictionary reads: "seeking to solve problems by unorthodox or apparently illogical methods."

Lateral thinking is about moving sideways when working on a problem to try different perceptions, different concepts and different points of entry. The term covers a variety of methods including provocations to get us out of the usual line of thought. Lateral thinking is cutting across patterns in a self-organising system, and has very much to do with perception.

For example: Granny is sitting knitting and three year old Susan is upsetting Granny by playing with the wool. One parent suggests putting Susan into the playpen. The other parent suggests it might be a better idea to put Granny in the playpen to protect her from Susan. A lateral answer!

The term "Lateral thinking" can be used in two senses:

- **Specific:** A set of systematic techniques used for changing concepts and perceptions, and generating new ones.
- **General:** Exploring multiple possibilities and approaches instead of pursuing a single approach.

Coming soon to this page will be a summary of de Bono's fundamental principles, and a nutshell guide of techniques.

Last updated: 5th October 1996

LATERAL THINKING

They are complimentary to each other

LATERAL THINKING

VERTICAL THINKING

- | | |
|--|--|
| 1. IS GENERATIVE | 1. IS SELECTIVE |
| 2. IS USED TO DIG A HOLE IN A DIFFRENT PLACE | 2. IS USED TO DIG THE SAME HOLE DEEPER |
| 3. IS CONCERNED WITH RESTRUC-
TURING CONCEPT PATTERNS (IN-
SIGHT) OR PROVOKING NEW
ONES (CREATIVTY) | 3. IS CONCERNED WITH PROVING OR
... DEVELOPING CONCEPT PATTERNS |
| 4. A SPECIAL SUBJECT TO BE
LEARNED | 4. IS ALMOST THE EXCLUSIVE EM-
PHASIS IN FORMAL EDUCATION |
| 5. RICHNESS IS WHAT MATTERS | 5. RIGHTNESS IS WHAT MATTERS |
| 6. DOES NOT SELECT, BUT SEEKS
TO OPEN UP OTHER PATHWAYS | 6. SELECTS A PATHWAY BY EXCLUD-
ING OTHER PATHWAYS |
| 7. GENERATES AS MANY ALTERNA-
TIVE APPROACHES AS POSSIBLE | 7. SELECTS THE MOST PROMISING
APPROACH TO A PROBLEM; THE
BEST WAY OF LOOKING AT A
SITUATION |
| 8. MOVES IN ORDER TO GENERATE
A DIRECTION | 8. MOVES ONLY IF THERE IS A
DIRECTION IN WHICH TO MOVE |
| 9. IS PROVOCATIVE | 9. IS ANALYTICAL |
| 10. CAN MAKE JUMPS | 10. IS SEQUENTIAL |
| 11. DOES NOT HAVE TO BE
CORRECT AT EVERY STEP | 11. HAS TO BE CORRECT AT EVERY
STEP |
| 12. THERE IS NO NEGATIVE | 12. NEGATIVE IS USED TO BLOCK
OFF CERTAIN PATHWAYS |
| 13. ONE WELCOMES CHANCE
INSTRUSIONS | 13. ONE CONCENTRATES AND EX-
CLUDES WHAT IS IRRELEVANT |

VERTICAL THINKING

LATERAL THINKING

They are complimentary to each other

14. CATEGORIES, CLASSIFICATIONS
AND LABELS ARE NOT FIXED

15. EXPLORES THE LEAST LIKELY
PATHS

16. IS A PROBABILISTIC PROCESS

17. INFORMATION IS USED NOT FOR
PROVOCATIVELY IN ORDER TO
BRING ABOUT RE-PATTERNING

14. CATEGORIES, CLASSIFICATIONS
AND LABELS ARE FIXED

15. FOLLOWS THE MOST LIKELY
PATHS

16. IS A FINITE PROCESS

17. INFORMATION IS USED FOR ITS
OWN SAKE IN ORDER TO MOVE
TO A SOLUTION

VERTICAL THINKING

'Dead Poets' inspiration is dismissed in Detroit

By Patricia Edmonds
USA TODAY

In the 1989 movie *Dead Poets Society*, the iconoclastic English teacher played by Robin Williams was fired by superiors but hailed by students in a defiant farewell.

But the real-life teacher who inspired Williams' portrayal didn't get to tell his students goodbye after he was fired this month.

John Campbell, 55, a teacher for 28 years at exclusive Detroit Country Day School, says officials dismissed him because "I don't fit the corporate image of what they conceive a teacher to be — although I think if you talk to my former students, they'll say I've been very successful."

As a high school student, Williams studied history, government and English under Campbell. He says he based his *Dead Poets* character, John Keating, partly on

Campbell's offbeat teaching style.

Headmaster Gerald Hansen wouldn't discuss the firing but said in a statement that Campbell had been "on probation for several years . . . and has not satisfactorily demonstrated a willingness to adhere to all the academic and professional standards" of the prestigious private academy in the tiny Detroit suburb of Birmingham.

Campbell's contract wasn't renewed for next year, and he was told not to resume teaching classes this spring after a brief leave. He says he'll probably retire.

Campbell — whose classroom techniques include throwing away books he deems inferior and moving desks while students are sitting in them — says he'll try "whatever happens to hit my mind" to excite students about learning. He wryly describes himself as "mildly crazy" and hardly indispensable because "there are thousands of good



By Audrey Shahyn, USA TODAY

CLASS ACT: John Campbell had a 'real love of knowledge and learning, just like the teacher Robin Williams portrayed,' a former student says.

teachers out there."

Former students say Campbell is one of a kind.

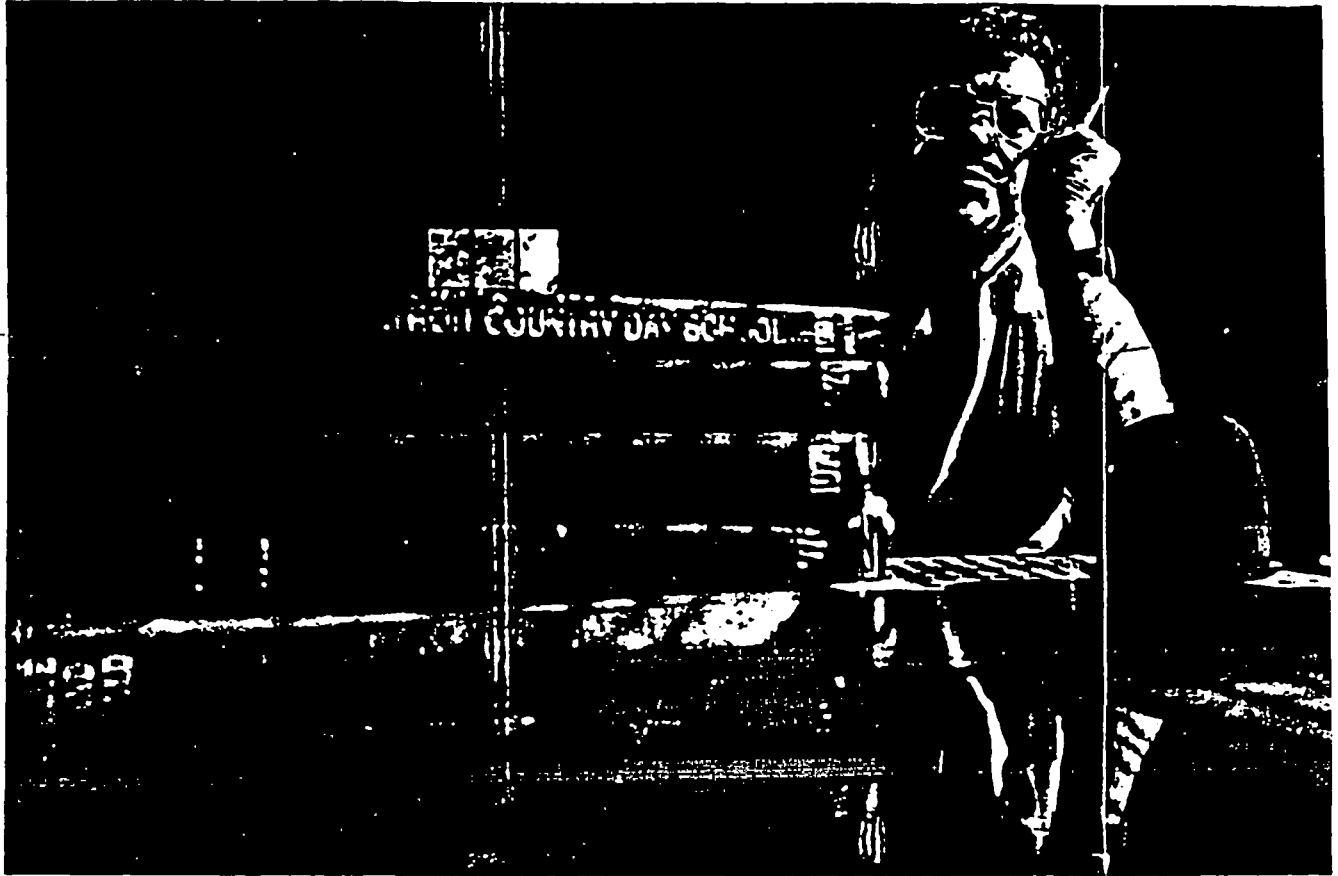
Michigan state Sen. David Honigman, Country Day Class of '74, says Campbell's government class inspired him to enter politics. To Honigman, Campbell's "eccentric-

ity was a good thing because he taught you, 'Don't worry about what other people think, be true to yourself and do your best.' He had a real love of knowledge and learning, just like the teacher Robin Williams portrayed — and he really loved the kids he taught."

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SCHOOL'S OUT

John Campbell, the real-life model for Robin Williams's character in *Dead Poets Society*, gets canned



YOU SAW THE MOVIE; NOW READ THE pink slip.

Robin Williams's 1989 performance as a passionate but iconoclastic teacher in the movie *Dead Poets Society* was largely based on John Campbell, who had taught Williams history at the posh Detroit Country Day School in Birmingham, Mich., in 1967. Three weeks ago, Campbell, 55, met the same fate as his celluloid counterpart: He was fired—and for similar reasons, say his supporters.

"John Campbell has been on probation for several years," announced Country Day headmaster Gerald T. Hansen. "[He] has not satisfactorily demonstrated a willingness to adhere to all the academic and professional standards of the school."

That would seem to put it mildly. By his own admission, Campbell's performance in the classroom was even more outrageous than Williams's in the movie. "Actually, Robin Williams wasn't as radical a teacher as I am," said



Campbell last week. "He tells the students to rip out the pages in their books. I tell them to throw the whole thing in the garbage."

The thrust of Campbell's pedagogy was to show his students they could

◀ Williams, the high-minded pedagogue in *Dead Poets Society*, has made no public comment about Campbell's firing.

▲ "I didn't fit the corporate image," says Campbell, "and [the school administrators] couldn't deal with that."

teach themselves. One day, Campbell, who had been at Country Day for 28 years, told a class that anybody could teach them. "We went out on the street and stopped the first car. I asked the guy to come in and teach history that day," remembers Campbell. Asked how the class went, Campbell responds. "I don't know. I left."

Although Country Day's officials claim they've received few complaints about the firing, students and their parents seemed stunned. "I am shocked," says Nora Peters, a member of the Mothers' Association, a PTA-like organization. "He was not just a good teacher, he was one of the few that didn't bore parents at Meet the Faculty night." ■

Indiana students face challenges in Odyssey of the Mind contest

Associated Press

GREENWOOD — Indiana schoolchildren rapped to a Robert Louis Stevenson poem and built objects out of marshmallows during Saturday's Indiana Odyssey of the Mind competition.

"We were just having fun," said 10-year-old Matthew Hickman from Cumberland Elementary in West Lafayette.

Hickman and other members of the fourth-grade Cumberland team donned sunglasses as they rapped their way through Stevenson's "Where Goes the Boats?" poem during the competition at Center Grove High School.

Teams from schools around the state competed in three divisions — elementary, middle and high school — tackling different problems requiring creative problem-solving.

Winners advance to the world competition in Ames, Iowa.

Students worked in advance on problems such as building a vehicle

to perform special tasks

In the case of the Cumberland Elementary team, students had to reproduce an original impressionist painting and write a poem to go with it and perform a skit tying the two together.

The other half of the competition focused on coming up with spontaneous answers to questions posed by judges. The more creative the answer the more points awarded.

"An example would be 'Name something that goes around'" Cumberland coach Karen Ivin said. "A common response would be a merry-go-round. But a creative response would be the chicken pox. That's what they're looking for."

Other problems required building objects such as making the tallest tower out of marshmallows and toothpicks, Ivin said.

Reed Norris's team from Jasper Middle School was given two of the flat parts of canning jar lids and asked to come up with some alternative uses.

The team decided on Frisbees for Rin Tin Tin, and armor to block the bullet that killed President Abraham Lincoln.

The winning teams for the various categories and divisions were:

■ "Amusin' Crusin'": Division 1 — Sharp Creek Elementary School; Div. 2 — St. Matthew School; Div. 3 (tie) — Jasper High School, Crothersville Community School Team A.

■ "Omvention": Div. 1 — Seymour Middle School; Div. 2 — Southridge High School.

■ "Classics/Great Impressions": Div. 1 — Pleasant Grove Elementary School; Div. 2 — Jasper Middle School; Div. 3 — Lawrenceburg High School.

■ "Crunch": Div. 1 — Pipe Creek Elementary School; Div. 2 — Maconaquah Middle School; Div. 3 — Northfield High School.

■ "Tall Tales": Div. 1 — Westlake Elementary School; Div. 2 — Jasper Middle School.

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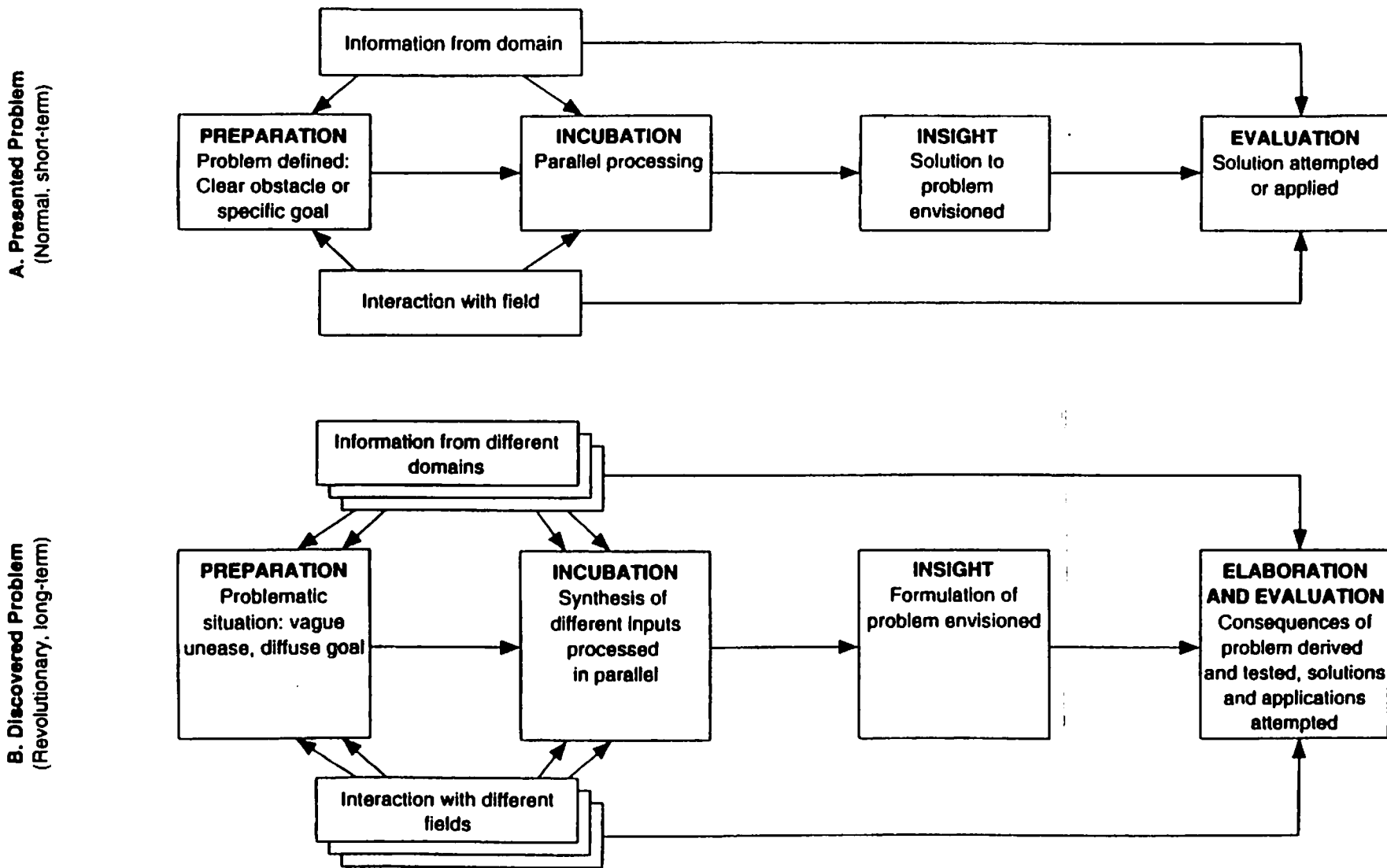


FIGURE 4.1 Csikszentmihalyi and Sawyer's (1993) proposed models of presented and discovered problem solving

SOURCE: From R. J. Sternberg & J. Davidson: *The Nature of Insight* (In press). MIT Press, Cambridge, MA. Reprinted by permission.



Mess-Finding

Component I: Understanding the Problem

D: Seeking opportunities for problem solving.

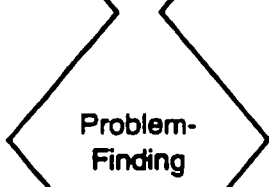
C: Establishing a broad, general goal for problem solving.



Data-Finding

D: Examining many details, looking at the Mess from many viewpoints.

C: Determining the most important data, to guide problem development.



Problem-Finding

D: Considering many possible problem statements.

C: Constructing or selecting a specific problem statement (stating the challenge).

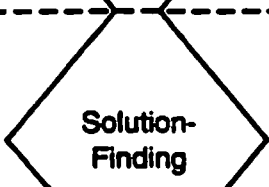


Idea-Finding

Component II: Generating Ideas

D: Producing many, varied, and unusual ideas.

C: Identifying promising possibilities—alternatives or options having interesting potentials.



Solution-Finding

Component III: Planning for Action

D: Developing criteria for analyzing and refining promising possibilities.

C: Choosing criteria, and applying them to select, strengthen, and support promising solutions.



Acceptance-Finding

D: Considering possible sources of Assistance/Resistance and possible actions for implementation.

C: Formulating a specific Plan of Action.

[Note: In each stage, D = Diverging; C= Converging]

Polya Method

Understand the problem (What is unknown? What are the data?)
Devising a plan (find the connection between data and unknown)
Carrying out the plan (check each step for correctness)

Osburn Method

Orientation (picking out problem)
Preoperation (gathering, organizing)
Analysis and Ideation (seeking possible solutions)
Incubation (time lag for mind to synthesize problem and solution)
Evaluation (verifying, testing)

Parnes Method

Objective Finding (mess finding)
Fact Finding (listing/data finding)
Problem Finding (selecting salient problem)
Idea Finding (brainstorming)
Solution Finding (criteria for evaluation)
Acceptance Finding (implementation)

Osch Method

Explorer (looking for materials for new ideas)
Artist (rearrange things)
Judge (evaluations and decisions)
Warrior (implementation)

Wallas Model

Preparation (acquiring knowledge and becoming aware of how problems fit together--evaluate possible problems and strategies)
Incubation (sorting out ideas--a period of quiet reflection and then brainstorming suggestions)
Illumination (Aha--find possible solution(s))
Verification (empirical testing of plan of action or solution)

Davis/AUTA Creativity Model

Awareness of the importance of creativity (to self and society)
Understanding of creativity (the creative person/process/theories)
Techniques (exposure to methods and strategies)
Self-Actualization (self motivation and realizing potential)

Torrance's Stepwise Process of Creativity

Sensing a problem or gap in information
Forming ideas or hypotheses
Testing and modifying hypotheses
Communicating the results

Rules for Brainstorming:

1. Criticism is ruled out (deferred judgment).
2. Freewheeling is welcomed (the wilder the better).
3. Quantity is wanted (longer lists increase the possibility of solution).
4. Combination and improvement are sought (hitch-hiking on ideas).

Gary A. Davis (1992)
Creativity is Forever

take a more active, high-initiative approach to improving our lives by looking for nuisances, challenges, or things that you would like to see happen—difficulties that seem to cry out "Help! Help! Get the CPS model, quick!"

To help you discover challenges and opportunities and generally increase your problem sensitivity, Parnes (1981) itemized a list of prodding questions, some of which are itemized below. Do these suggest topics for one-person CPS sessions?

- What would you like to get out of life?
- What are your goals, as yet unfilled?
- What would you like to accomplish, to achieve?
- What would you like to have?
- What would you like to do?
- What would you like to do better?
- What would you like to happen?
- In what ways are you inefficient?
- What would you like to organize in a better way?
- What ideas would you like to get going?
- What relationship would you like to improve?
- What would you like to get others to do?
- What takes too long?
- What is wasted?
- What barriers or bottlenecks exist?
- What do you wish you had more time for?
- What do you wish you had more money for?
- What makes you angry, tense, or anxious?
- What do you complain about?

Now what is this superlative set of stages?

Five Steps
Guide Creative
Problem Solving

Divergent Then
Convergent
Thinking At
Each Step

The five stages are *fact-finding*, *problem-finding*, *idea-finding*, *solution-finding* (evaluation), and *acceptance-finding* (implementation). The steps guide the creative process; that is, they tell you what to do at each immediate step in order to eventually produce one or more creative, workable solutions. A unique feature is that each step first involves a *divergent* thinking phase, in which lots of ideas (facts, problem definitions, ideas, evaluation criteria, implementation strategies) are generated, then a second *convergent* phase, in which only the most promising ideas are selected for further exploration. Figure 5.1 illustrates the divergent/convergent nature of each step.

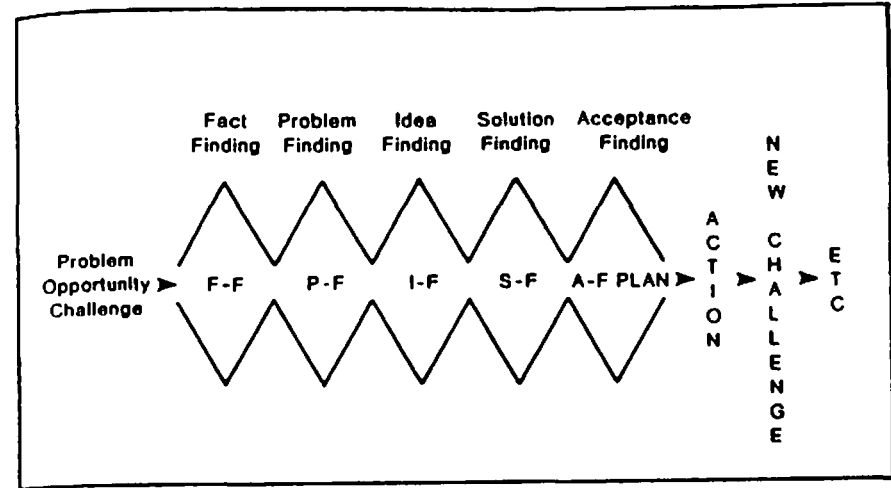


Figure 5.1 The creative problem solving (CPS) model.

Fact Finding

The first stage, *fact-finding*, involves "listing all you know about the problem or challenge" (Parnes, 1981) "... to help you explore all the information, impressions, observations, feelings, and questions that you have about a mess on which you've decided to work" (Isaksen & Treffinger, 1985). Parnes recommends the use of *who*, *what*, *when*, *where*, *why* and *how* questions. That is:

Who Did What
When, Where,
Why, and How?

- Who is or should be involved?
- What is or is not happening?
- When does this or should this happen?
- Where does or doesn't this occur?
- Why does it or doesn't it happen?
- How does it or doesn't it occur?

Fact-Finding
Similar to
Preparation
Stage

The CPS fact-finding stage clearly parallels the preparation stage in the Wallas model. As an example, let's say the problem is thinking of ways to stimulate creativity in a classroom room or business organization. An individual or group first would list all of the facts they could think of relating to training creative thinking and perhaps to the nature of creativity and creative abilities. The *who*, *what*, *when*, *where*, *why* and *how* questions aid thinking in this step. The list of Ideas is then convergently narrowed to a smaller number of facts that might be especially productive.

Davis (1992)

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FUTURE PROBLEM SOLVING PROCESS

STEP 1: RESEARCHING THE BROAD TOPIC

STEP 2: LISTING SUBPROBLEMS

- a. Situation is reviewed and discussed.
- b. Brainstorming of all possible problems arising from the situation.

STEP 3: RECOGNIZING AND STATING THE UNDERLYING PROBLEM

- a. Discuss and decide which problem is the most basic. Which problem, if solved, would clear up many of the other smaller problems?
- b. Write the underlying problem using one of the two phrases to begin: "In what ways might we...?" or "How might we...?"

STEP 4: PRODUCING ALTERNATIVE SOLUTIONS

- a. Brainstorm all possible solutions to the stated problem.
- b. When stuck, use SCAMPER stimulators.
- c. Each team member says his idea out loud and writes it down on an index card.

STEP 5: DEVELOPING CRITERIA FOR JUDGING SOLUTIONS

- a. Criteria are developed. Five are optimal.

STEP 6: EVALUATING ALTERNATIVE SOLUTIONS

- a. Select 10 most promising solutions.
- b. Place solutions and criteria on evaluation grid.
- c. Rank order the solutions according to each criterion.
- d. Total scores for each solution; highest scoring solution wins.

STEP 7: DESCRIBING THE BEST SOLUTION

- a. Improve upon that solution which received the highest score.
- b. Develop and explain in paragraph form.

Creativity (Perkins, 1988):

- a. Creativity: "a creative result is a result both original and appropriate."
- b. Creative Person: "a creative person--a person with creativity--is a person who fairly routinely produces creative results."

Creative Process (Torrance 1988):

"I tried to define creative thinking as a process of (1) sensing difficulties, problems, gaps in information, missing elements, something askew; (2) making guesses and formulating hypotheses about these deficiencies; (3) evaluating and testing these guesses and hypotheses; (4) possibly revising and retesting them; and finally (5) communicating the results."

The three-four P's (Davis, 1992):

Creative Person (look for traits; e.g., visionary type)

Creative Process (looking at stages, steps, actions, behaviors)

Creative Product (looking at composition, design, innovation, fitness, worthiness)

Creative Press (look at environment, climate, place)

Personality Characteristics:

1. Willingness to take risks
2. Perseverance, Drive, Commitment to Task
3. Curiosity
4. Openness to Experience, Open-Minded
5. Tolerance for Ambiguity
6. Broad Interests
7. Value Originality
8. Intuition and Deep Emotions, Perceptive
(imaginative play, similes, analogies, guesses)
9. Being Internally Occupied, Withdrawn, Needs Privacy Time
10. Awareness of Their Own Creativeness
11. Sense of Humor
12. Attracted by Complexity & Novelty
13. Artistic

Creativity Traits:

1. Products: Fluency, Flexibility, Originality, Elaboration
2. Attitudes: Curiosity, Imagination, Complexity, Risk Taking
3. Behaviors: Flexible, Imaginative, Nonconforming, Novel Answers

Thinking/Cognitive Characteristics:

1. Metaphoric Thinking (new synthesis, perspective, transformation)
2. Flexibility & Skill in Decision Making
3. Independence in Judgment (not compelled by latest trends)
4. Coping Well with Novelty (What if?, work with ideas)
5. Logical Thinking Skills (evidence, conclusions, if-then, cause-effect)
6. Visualization (imagery, personal analogies)
7. Escaping Entrenchment (new angle/pattern, break set, unpredictable)
8. Finding Order in Chaos (complexity in thought, asymmetrical images)
9. Problem Finding
10. Evaluation

Negative Creative Traits:

1. Tends to question laws, rules, authority
2. Indifferent to common conventions and courtesies
3. Stubborn, uncooperative, resists domination
4. Argues the rest are out of step
5. May not participate in class
6. Argumentative, cynical, sarcastic, rebellious
7. Demanding, assertive, autocratic
8. Low interest in details
9. Sloppy, careless, disorganized with unimportant matters
10. Self-centered, intolerant, tactless
11. Capricious
12. Temperamental, moody
13. Emotional, withdrawn, aloof, uncommunicative
14. Forgetful, absentminded, mind wanders, watches windows
15. Overactive physically or mentally
16. Won't join scouts

Table 1. Presumed Psychiatric Disturbances of Some Eminent Writers, Artists, Composers, and Scientists*

	Schizophrenia	Affective disorders (unipolar and bipolar)		Personality disorders ^b	
Writers, poets and philosophers	Baudelaire	Barrie	Lamb	E. B. Browning	
	Hölderlin	Balzac	London ^c	R. Browning	
	Johnson	Berryman ^c	Lowell	Carlyle	
	Kant	Blake	Mill	Comte	
	Keats	Buxwell	Maupassant	Ekly	
	Strindberg	Byron	O'Neill	Eliot	
	Swift	Chatterton ^c	Plath ^c	Georg	
		Culeridge	Poe	Heine	
		Collins	Ruethke	Huxley	
		Conrad	Rossetti	Proust	
		Cowper	Rousseau	Rimbaud	
		Crane ^c	Saroyan	Spencer	
		Fergusson	Schiller	Tennyson	
		Fitzgerald	Schopenhauer	Zola	
		Frost	Sexton ^c		
		Goethe	Shelley		
		Hemingway ^c	Smart		
		Hopkins	Tasso		
		Kafka	Woolf ^c		
	Artists	Beil ^c	Crevel ^c		
		Brendel ^c	Michelangelo		
Cellini		Modigliani ^c			
Da Vinci		Pollock ^c			
El Greco		Raphael			
Goya		Rothko ^c			
Klotz ^c		Van Gogh ^c			
Knopfer ^c					
Moog ^c					
Neter ^c					
Orth ^c					
Pohl ^c					
Rembrandt					
Sell ^c					
Wain					
Wetz ^c					
Composers	Donizetti	Berlioz	Beethoven		
	Mendelssohn	Chopin	Schubert		
	Rimsky-Korsakov	Elgar	Wagner		
		Handel			
		Mahler			
		Rachmaninoff			
		Rossini			
		Schumann			
		Scriabin			
		Tchaikovsky			
	Wolf				
	Wond				

Table 1. (Continued)

	Schizophrenia	Affective disorders (unipolar and bipolar)	Personality disorders
Scientists	Cantor	Darwin	Ampere
	Copernicus	De Finest	Einstein
	Descartes	Mayer	Freud
	Faraday	Kammerer ^c	Heaviside
	Hamilton		Mendel
	Lagrange		Nightingale
	Linnaeus		
	Newton		
	Pascal		
	Swedenborg		
	Weierstrass		

*These "diagnostic classifications" are based almost entirely on presumptive judgments made from archival and anecdotal evidence and should be construed as inferential "best guesses."

^bThis category undoubtedly includes individuals who were highly eccentric but otherwise not psychiatrically disturbed. It also includes others (e.g., Comte, who was described by Nisbet, 1912, as schizophrenic) who rightly belong in a different category.

^cSuicides.

^dThese ten artists were designated as schizophrenic by Prinzbaum (1932), however, case descriptions strongly suggest that several were affective disorders.

(Tsanoff, 1949). Lombroso (1910) further claimed that many great musicians, including Mozart, Schumann, Beethoven, Handel, Pergolesi, and Donizetti, suffered from "attacks of insanity," including delusions, hallucinations, depression, and mania. Lombroso also included Rousseau, Newton, Comte, and Ampere in this latter category. Lange-Eichbaum (1932), who looked at the temporal relationship of mental illness to creativity, found that many artists become psychotic only after their major contributions were made. He included in this group Baudelaire, Donizetti, Kant, Faraday, Newton, Copernicus, and Linnaeus. Lange-Eichbaum placed the majority of highly creative artists in the "psychopath" category, a term not referring to psychopathy in the Cleckley (1964) sense but to a poorly socialized, schizoid, or schizothymic personality. In this group he included Beethoven, Michelangelo, Schopenhauer, Byron, and Heine.

Beethoven was said to have experienced a variety of subsidiary delusions, ranging from persecution, hero-rescue, fratricide, and sacrifice to birth fantasies (Solomon, 1975). Grillparzer, an Austrian playwright and frequent companion of Beethoven, described Beethoven as "half-crazy" and "a wild beast" when angry (Reichsman, 1981). Larkin's (1970) thorough treatment of Beethoven's medical history suggests that the composer was eccentric,

given to violent tantrums, occasionally very depressed, and often "muddled" or forgetful; however, there is little evidence that he was delusional.

The picture then is of persistent ill health, of a prevailing mood of depression, a highly strung, suspicious, "persecuted" man, unstable under stress, hypomanic at times, impulsive to the point of violence, perfectionist, deaf, irritable. Nevertheless, he had enormous charm, and although he might one day drive a visitor away with brutal discourtesy, he would put himself out to be attentive on another occasion. Here is a man who tried to make up for his failings in temperament, breeding, and education, whose tremendous achievements were in spite of cruel handicaps and who did not flounder in self-pity, though not above occasionally being pathetic in letters to women (p. 460).

Schumann believed that Beethoven and Mendelssohn dictated musical compositions to him from their tombs (Lombroso, 1910). In a recent article about Schumann, Murphy (1979) described the composer's battle with mental illness:

Robert had been mentally unstable all his life, haunted by fears of insanity since the age of 18.

In 1834, he complained of a "very strong and painful attack" of ear trouble that had hounded him before. This was followed by illusions, such as dictation by angels of a theme on which he wrote some piano variations.

About 16 days later, he asked to be taken to a tonetic asylum, and the next day attempted to drown himself.

In March 1834, he was put in a private asylum in Finkenich, where he lived for about 2½ years. Clara was kept from him for fear that her visit would be undisturbing.

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Why Measure?

1. Screen
2. Identify Creative and Gifted
3. Strengthen
4. Evaluate important features
5. See potential
6. Support Strengths of Individuals
7. Provides baseline data to diagnose needs
8. Evaluate efforts to enhance creativity
9. Provide a common language to discuss CR
10. Remove creativity from mystery/superstition

How Measure?

1. Self-Assessment
2. Peer, Parent, Teacher Rating/Nomination
(e.g., adjective check lists)
3. Observations
4. Products
5. Personality Tests
6. Biographical Sketches
7. Aptitude and Ability Tests
8. Awards
9. Acceleration, Mentorship, Enrichment Programs
10. Problem Finding/Solving

Creativity Assessment Issues:

1. Reliability Inadequate
2. Validity Questionable
3. Authentic Assessment
4. Predictive Validity
5. Self-Assess not Honest
6. What exactly is creativity?
7. How many forms?

Creativity Tests:

1. Exercise in Divergent Thinking (CAP Packet)
2. Exercise in Divergent Feeling (CAP Packet)
3. The Williams Scale (CAP Packet)
4. Wallas & Kogan Tests
5. Monitor Tests of Creative Potential
6. How Do You Think (Davis)
7. Structure of the Intellect
(SOI; Guilford Tests: Contents, Operations, Products)
8. Group Inventory for Finding Creative Talent
(i.e., Davis: GIFFI I/II, GIFT, PRIDE)
9. Torrance Tests of Creative Thinking (TTCT)
10. Adjective Check List
11. Getzels and Jackson Tests
12. Creative Attitude Survey (Schaeffer)
13. Thinking Creatively in Action and Movement (Torrance)
14. Thinking Creativity with Sounds and Words (Torrance)
15. Barron-Welsh Art Scale
16. Remote Associates Tests (RAT)
17. The Creative Reasoning Test
(20 items to assess creativity using riddles)
18. Biographical Inventory-Creativity
19. Instruments assessing creative products
20. The Creativity Behavior Inventory
21. Khatena-Torrance Creative Perception Inventory
 - a. What Kind of Person Are You? (WKOPAY)
(Five factors: acceptance of authority, self-confidence, inquisitiveness, awareness of others, and disciplined imagination)
 - b. Something about Myself.

DAVIS

Self-rating of Creativity

I AM A CREATIVE PERSON

Strongly
Disagree

Unsure

Strongly
Agree

1 2 3 4 5 6 7 8 9

Creativity Test

Indicate the degree to which each statement applies to you. Use the following scale:

- 1 = No
- 2 = To a small degree
- 3 = Average
- 4 = More than average
- 5 = Definitely

- _____ 1. I am unconventional in many ways.
- _____ 2. I am very artistic.
- _____ 3. I am quite absent-minded.
- _____ 4. I try to use metaphors and analogies in my writing.
- _____ 5. I am a very active, energetic person.
- _____ 6. I enjoy thinking of new and better ways of doing things.
- _____ 7. I am very curious.
- _____ 8. I am quite original and inventive.
- _____ 9. Some of my past or present hobbies would be considered "unusual."
- _____ 10. I like the nonsense forms and bright colors of modern art.
- _____ 11. My ideas are often considered impractical or even "wild."
- _____ 12. I would rate myself high on "intuition" or "insightfulness."
- _____ 13. I like some body smells.

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- _____ 14. I am able to work intensely on a project for many hours.
- _____ 15. I like trying new ideas and new approaches to problems.
- _____ 16. I often become totally engrossed in a new idea.
- _____ 17. Most of my friends are unconventional.
- _____ 18. The word "quick" describes me.
- _____ 19. I could be considered a spontaneous person.
- _____ 20. I have engaged in a lot of creative activities.
- _____ 21. I would rate myself high in self-confidence.
- _____ 22. I am always open to new ideas and new activities.
- _____ 23. Sometimes I get so interested in a new idea that I neglect what I should be doing.
- _____ 24. I am often inventive or ingenious.
- _____ 25. I enjoy trying new approaches to problems.
- _____ 26. I have taken things apart just to find out how they work.
- _____ 27. I have participated in theatrical productions.
- _____ 28. I have a great sense of humor.
- _____ 29. Many stories of mysterious, psychical happenings are true.
- _____ 30. When I was young, I was always building or making things.

Scoring: Add up your ratings. The following is a guideline for interpretation:

30 - 55	Low in creative personality traits
56 - 79	Below average
80 - 102	Average
103 - 126	Above average
127 - 150	High in creative personality traits

Does your test score agree with your initial rating?

Does your test score generally agree with your Self-Actualization score at the end of Chapter 1?

Regardless of your score (but especially if it is below about 90), try developing your creative personality traits—see Chapter 4.

Gough Personality Scale

Gough, H. G. (1979). A creative personality scale for the Adjective Check List. *Journal of Personality and Social Psychology*, 37, 1398-1405.

Gough, H. G., & Heilbrun, A. B., Jr. (1965). *The Adjective Check List manual*. Palo Alto, CA: consulting Psychologists Press.

Please indicate which of the following adjectives best describe yourself.

Check all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Capable | <input type="checkbox"/> Honest |
| <input type="checkbox"/> Artificial | <input type="checkbox"/> Intelligent |
| <input type="checkbox"/> Clever | <input type="checkbox"/> Well-mannered |
| <input type="checkbox"/> Cautious | <input type="checkbox"/> Wide interests |
| <input type="checkbox"/> Confident | <input type="checkbox"/> Inventive |
| <input type="checkbox"/> Egotistical | <input type="checkbox"/> Original |
| <input type="checkbox"/> Commonplace | <input type="checkbox"/> Narrow interests |
| <input type="checkbox"/> Humorous | <input type="checkbox"/> Reflective |
| <input type="checkbox"/> Conservative | <input type="checkbox"/> Sincere |
| <input type="checkbox"/> Individualistic | <input type="checkbox"/> Resourceful |
| <input type="checkbox"/> Conventional | <input type="checkbox"/> Self-confident |
| <input type="checkbox"/> Informal | <input type="checkbox"/> Sexy |
| <input type="checkbox"/> Dissatisfied | <input type="checkbox"/> Submissive |
| <input type="checkbox"/> Insightful | <input type="checkbox"/> Snobbish |
| <input type="checkbox"/> Suspicious | <input type="checkbox"/> Unconventional |

Scoring Key:

___+___ Capable

___-___ Artificial

___+___ Clever

___-___ Cautious

___+___ Confident

___+___ Egotistical

___-___ Commonplace

___+___ Humorous

___-___ Conservative

___+___ Individualistic

___-___ Conventional

___+___ Informal

___-___ Dissatisfied

___+___ Insightful

___-___ Suspicious

___-___ Honest

___+___ Intelligent

___-___ Well-mannered

___+___ Wide interests

___+___ Inventive

___+___ Original

___-___ Narrow interests

___+___ Reflective

___-___ Sincere

___+___ Resourceful

___+___ Self-confident

___+___ Sexy

___-___ Submissive

___+___ Snobbish

___+___ Unconventional

Creative Behavior Inventory (Hocevar, 1979, 1980)

Hocevar, D. (1980). Intelligence, divergent thinking, and creativity. *Intelligence*, 4, 25-40.

This is an inventory, not a test. The inventory is simply a list of activities and accomplishments that are commonly considered to be creative. For each item, circle the answer that best describes the frequency of the behavior in your adolescent and adult life. Be sure to answer every question, and don't worry about duplicate or similar items.

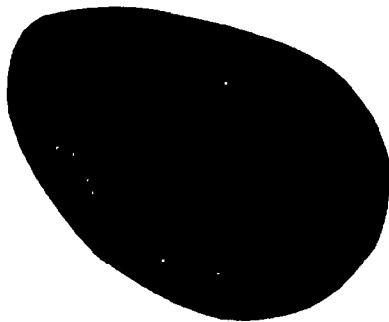
	Never	Once	Twice	3-4 times	5-6 times	More than 6 times
1. Received an award for acting.	0	1	2	3-4	5-6	7+
2. Worked as an editor for a school or university literary publication.	0	1	2	3-4	5-6	7+
3. Worked as an editor for a newspaper or similar organization.	0	1	2	3-4	5-6	7+
4. Constructed something that required scientific knowledge such as a radio, telescope, scientific apparatus, etc. (excluding school or university course work).	0	1	2	3-4	5-6	7+
5. Painted an original picture.	0	1	2	3-4	5-6	7+
6. Designed and made your own greeting card.	0	1	2	3-4	5-6	7+
7. Gave a recital.	0	1	2	3-4	5-6	7+
8. Presented an original mathematics paper to a professional or special interest group.	0	1	2	3-4	5-6	7+
9. Founded a literary magazine or similar publication.	0	1	2	3-4	5-6	7+
10. Made a craft out of metal (excluding school or university work).	0	1	2	3-4	5-6	7+
11. Made candles.	0	1	2	3-4	5-6	7+
12. Knitted or crocheted something (excluding school or university work).	0	1	2	3-4	5-6	7+
13. Put on a puppet show.	0	1	2	3-4	5-6	7+
14. Made your own holiday decorations.	0	1	2	3-4	5-6	7+
15. Built a hanging mobile (excluding school or university work).	0	1	2	3-4	5-6	7+
16. Received an award for performance in modern dance or ballet.	0	1	2	3-4	5-6	7+
17. Received an award for performance in popular dance.	0	1	2	3-4	5-6	7+
18. Had a mathematics paper published.	0	1	2	3-4	5-6	7+
19. Made a sculpture (excluding school or university work).	0	1	2	3-4	5-6	7+
20. Had an original music published or publicly performed.	0	1	2	3-4	5-6	7+
21. Had a piece of literature (poem/short stories, etc.) published in a school or university publication.	0	1	2	3-4	5-6	7+
22. Developed an experimental design (excluding school or university work).	0	1	2	3-4	5-6	7+
23. Wrote poems (excluding school or university work).	0	1	2	3-4	5-6	7+
24. Entered a project into a science contest.	0	1	2	3-4	5-6	7+
25. Received an award for an artistic accomplishment.	0	1	2	3-4	5-6	7+
26. Received an award for making a craft.	0	1	2	3-4	5-6	7+
27. Made a craft out of plastic, Plexiglas, stained glass or a similar material.	0	1	2	3-4	5-6	7+

	Never	Once	Twice	3-4 times	5-6 times	More than 6 times
28. Made cartoons.	0	1	2	3-4	5-6	7+
29. Made a leather craft.	0	1	2	3-4	5-6	7+
30. Made a ceramic craft.	0	1	2	3-4	5-6	7+
31. Wrote music for one instrument.	0	1	2	3-4	5-6	7+
32. Wrote music for several instruments.	0	1	2	3-4	5-6	7+
33. Designed and made a piece of clothing	0	1	2	3-4	5-6	7+
34. Cooked an original dish.	0	1	2	3-4	5-6	7+
35. Prepared an original floral arrangement.	0	1	2	3-4	5-6	7+
36. Applied math in an original way to solve a practical problem (excluding school or university work).	0	1	2	3-4	5-6	7+
37. Wrote an original computer program (excluding school or university work).	0	1	2	3-4	5-6	7+
38. Drew a picture for aesthetic reasons.	0	1	2	3-4	5-6	7+
39. Wrote the lyrics to a song.	0	1	2	3-4	5-6	7+
40. Choreographed a dance.	0	1	2	3-4	5-6	7+
41. Wrote a short story (excluding school or university work).	0	1	2	3-4	5-6	7+
42. Wrote something humorous such as jokes, limericks, satire, etc.	0	1	2	3-4	5-6	7+
43. Made jewelry.	0	1	2	3-4	5-6	7+
44. Recorded a music record or CD.	0	1	2	3-4	5-6	7+
45. Put on a radio show.	0	1	2	3-4	5-6	7+
46. Had a piece of literature (poem, short story, etc.) published (not in a school or university-related publication).	0	1	2	3-4	5-6	7+
47. Took and developed your own photographs.	0	1	2	3-4	5-6	7+
48. Performed ballet or modern dance in a show or contest.	0	1	2	3-4	5-6	7+
49. Had art work or craft work publicly exhibited.	0	1	2	3-4	5-6	7+
50. Won an award for musical accomplishments.	0	1	2	3-4	5-6	7+
51. Wrote clever or humorous letters.	0	1	2	3-4	5-6	7+
52. Won an award for a scientific project or paper.	0	1	2	3-4	5-6	7+
53. Assisted in the design of a set for a musical or dramatic production.	0	1	2	3-4	5-6	7+
54. Had art work published in a school or university publication.	0	1	2	3-4	5-6	7+
55. Had a role in a dramatic production.	0	1	2	3-4	5-6	7+
56. Had art work published.	0	1	2	3-4	5-6	7+
57. Started but did not finish a novel.	0	1	2	3-4	5-6	7+
58. Wrote and completed a novel.	0	1	2	3-4	5-6	7+
59. Made or helped make a film or video tape.	0	1	2	3-4	5-6	7+

	Never	Once	Twice	3-4 times	5-6 times	More than 6 times
60. Won an award for some achievement in literature.	0	1	2	3-4	5-6	7+
61. Entered a mathematical paper or project into a contest.	0	1	2	3-4	5-6	7+
62. Had a scientific paper published.	0	1	2	3-4	5-6	7+
63. Planned and kept a garden.	0	1	2	3-4	5-6	7+
64. Kept a sketch book.	0	1	2	3-4	5-6	7+
65. Was a participating member of a symphony orchestra.	0	1	2	3-4	5-6	7+
66. Entered a contest as a singer.	0	1	2	3-4	5-6	7+
67. Entered a contest as a musician.	0	1	2	3-4	5-6	7+
68. Directed or managed a dramatic production.	0	1	2	3-4	5-6	7+
69. Designed and made a costume.	0	1	2	3-4	5-6	7+
70. Played an instrument (percussion, including piano) with a reasonable degree of proficiency.	0	1	2	3-4	5-6	7+
71. Played an instrument (string) with a reasonable degree of proficiency.	0	1	2	3-4	5-6	7+
72. Played an instrument (brass) with a reasonable degree of proficiency.	0	1	2	3-4	5-6	7+
73. Played an instrument (wind) with a reasonable degree of proficiency.	0	1	2	3-4	5-6	7+
74. Participated in a drama workshop, club, or similar organization.	0	1	2	3-4	5-6	7+
75. Participated in a craft workshop, club, or similar organization.	0	1	2	3-4	5-6	7+
76. Participated in a writers' workshop, club, or similar organization.	0	1	2	3-4	5-6	7+
77. Participated in a dance workshop, club, or similar organization.	0	1	2	3-4	5-6	7+

Activity 1 Picture Construction

Think of an object or picture you can draw with this shape as a part. when done, make a clever and unusual title; use it to help tell your story



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YOUR TITLE: _____

Activity 6: UNUSUAL QUESTIONS

In this activity, you are to think of as many questions as you can about cardboard boxes. These questions should lead to a variety of different answers and might arouse interest and curiosity in others concerning boxes. Try to think of questions about aspects of cardboard boxes which people do not usually think about.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____

Torrance Test of Creative Thinking
(1974)







Activity 5: UNUSUAL USES (Cardboard Boxes)

Most people throw their empty cardboard boxes away, but they have thousands of interesting and unusual uses. In the spaces below and on the next page, list as many of these interesting and unusual uses as you can think of. Do not limit yourself to any one size of box. You may use as many boxes as you like. Do not limit yourself to the uses you have seen or heard about; think about as many possible new uses as you can.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____

Activity 3. LINES

In ten minutes see how many objects or pictures you can make from the pairs of straight lines below and on the next two pages. The pairs of straight lines should be the main part of whatever you make. With pencil or crayon add lines to the pairs of lines to complete your picture. You can place marks between the lines, on the lines, and outside the lines—wherever you want to in order to make your picture. Try to think of things that no one else will think of. Make as many different pictures or objects as you can and put as many ideas as you can in each one. Make them tell as complete and as interesting a story as you can. Add names or titles in the spaces provided.

1. 	2. 	3. 
4. 	5. 	6. 

Frances (1974)

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Remote Associations Test

- | | | |
|--------------|-------------|---------|
| 1. stop | petty | sneak |
| 2. elephant | lapse | vivid |
| 3. lick | sprinkle | mines |
| 4. shopping | washer | picture |
| 5. stalk | trainer | king |
| 6. sea | home | stomach |
| 7. walker | main | sweeper |
| 8. mouse | sharp | blue |
| 9. envy | golf | beans |
| 10. board | magic | death |
| 11. athletes | web | rabbit |
| 12. put | butterflies | pump |
| 13. bald | screech | emblem |
| 14. note | dive | chair |
| 15. cherry | time | smell |

2

- | | | |
|---------------|----------|---------|
| 16. Southern | console | station |
| 17. chocolate | fortune | tin |
| 18. bass | complex | sleep |
| 19. wicked | hustle | slicker |
| 20. skunk | kings | boiled |
| 21. habit | pouch | load |
| 22. soap | shoe | tissue |
| 23. blood | music | cheese |
| 24. room | Saturday | salts |
| 25. widow | bite | monkey |
| 26. chamber | staff | box |
| 27. inch | deal | peg |
| 28. puss | spit | spoiled |
| 29. jump | kill | bliss |
| 30. sore | shoulder | sweat |

3

The Williams Scale

A PARENT AND TEACHER RATING SCALE OF CHILDREN'S DIVERGENT THINKING AND FEELING RELATED TO CREATIVITY

Following are four open-ended questions which will allow you an opportunity to express your reactions about the child and a program in school for creative children. Make your statements brief but specific.

1. Do you think this child is or may be bright? _____ Yes _____ No (check one)

If yes, why? _____

If no, why? _____

2. Do you think this child is or may be creative? _____ Yes _____ No (check one)

If yes, report briefly what he or she does in a creative way _____

If no, why not? _____

3. What do you expect of a school program for creative children? _____

4. What would you like to see a child accomplish as a result of participation in a program for creative children? _____

Child's Name _____ Date _____ Grade _____

School _____ Age _____
yrs. mos.

Person completing scale _____ Relationship to child _____

How long have you known the child? _____

DIRECTIONS FOR USING THE SCALE

Check the appropriate box beside each item which best describes the child's behavior.

Often
Sometimes
Seldom

FLUENCY

- | | | | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child thinks of several answers when a question is asked. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child draws several pictures when asked to draw one. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child has several ideas about something instead of just one. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child asks many questions. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child uses a large number of words when expressing ideas. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child works rapidly and produces a great deal. |

FLEXIBILITY

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child thinks of many ways to use an object rather than its common use. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child expresses more than one meaning for a picture, story, poem, or problem. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child can transfer meaning in one subject to another subject. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child shifts his point of view to another point of view. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child exhibits a variety of ideas and explores many of them. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The child thinks of numerous possibilities for solving a problem. |

*Williams (1980)
Creativity Assessment Packet
Baltimore, NY: DOK*

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Often Sometimes Seldom ORIGINALITY

- The child likes objects in a room placed off-center or prefers drawings and designs which are asymmetrical.
- The child becomes dissatisfied with one right answer and seeks other options.
- The child thinks in uncommon ways.
- The child enjoys the unusual and dislikes ordinary ways of doing things.
- The child, after having read or heard about a problem, begins inventing solutions.
- The child questions established methods and devises new methods of problem solution.

ELABORATION

- The child adds lines, color, and details to his/her drawing.
- The child senses a deeper meaning in an answer or solution and produces more depth of meaning.
- The child takes off with another's idea and alters it in some way.
- The child wants to "jazz-up" or embellish the work or ideas of others.
- The child has little interest in ordinary objects and adds details to make them better.
- The child changes the rules of games.

CURIOSITY

- The child questions everything and everybody.
- The child loves to explore mechanical things.
- The child is constantly searching for new avenues of thinking.
- The child normally explores things and ideas which are new to him.
- The child is alert to possibilities for solutions.
- The child explores books, games, maps, pictures, etc., to find more meaning.

Often Sometimes Seldom IMAGINATION

- The child makes up stories about places never seen.
- The child imagines how others would deal with a problem.
- The child daydreams about things or places.
- The child likes to imagine things he has never experienced.
- The child sees things in pictures or drawings other than the obvious.
- The child can wonder freely about things and ideas.

COMPLEXITY

- The child is interested in intricate things and ideas.
- The child likes to involve himself in complicated tasks.
- The child wants to figure things out without assistance.
- The child enjoys tasks that are difficult.
- The child thrives on trying again and again in order to succeed.
- The child produces more complex solutions to problems than seem necessary.

RISK-TAKING

- The child will defend ideas regardless of the reactions of others.
- The child sets high goals of accomplishment and is not afraid to try to achieve them.
- The child admits to mistakes or failures.
- The child likes trying new things or ideas and is not easily influenced by friends.
- The child is not overly concerned with disapproval by classmates, teachers or parents.
- The child prefers taking chances or "dares" just to learn of the outcomes.

Schaefer (1991). Creative Attitude
Survey. Jacksonville, FL: Psychology
and Educators, Inc.
CREATIVITY ATTITUDE SURVEY

by

Charles E. Schaefer, Ph.D.
Fordham University

Student's Name _____ Age _____ Sex _____ Date _____
School _____ Class (or Grade) _____
Teacher _____ Rater _____

Directions

On the following pages we would like you to tell us how you think and feel about different things. There are no right answers except those that are accurate about yourself.

For each statement we want you to circle the word "Yes" if you AGREE, or the word "No" if you DISAGREE.

Be sure to answer Yes or No to every question, even if it seems hard to decide.

1. Yes No I like to play "make believe" games.
2. Yes No I often act on the spur of the moment without stopping to think.
3. Yes No I like social studies better than science.*
4. Yes No I think daydreaming is a waste of time.
5. Yes No In art class, I prefer to be told exactly what to do all the time.
6. Yes No I feel that thinking up ideas that are "way out" or "fantastic" is a waste of time.
7. Yes No I think that the best answers are the ones the teacher thinks are right.
8. Yes No I think that stories about wizards and magicians are silly.
9. Yes No I would rather think up a picture on my own than trace or copy one.
10. Yes No I think it is better for children to keep quiet in class than to give ideas that might be wrong.
11. Yes No Some children are naturally born with better imaginations than others and there is nothing that can be done about it.
12. Yes No I'm afraid to express my ideas because they are usually no good.
13. Yes No I would rather learn strange new games than play games that I know well.
14. Yes No My favorite color is blue.*
15. Yes No Other children have better ideas than I do, and it is best to follow what they do.
16. Yes No Art is one of my favorite subjects in school.
17. Yes No I like to "clown around" and pretend to be other people.
18. Yes No I think that children have a lot of good ideas and that teachers should listen to them more often in class.
19. Yes No If someone gets an idea that is different from everyone else's, the idea is probably not a very good; otherwise other children would have thought of it too.

20. Yes No I like to take my time and think up a number of ideas before trying to solve a problem.
21. Yes No I feel that I have a good imagination.
22. Yes No I admire artists and writers as much as doctors and lawyers.
23. Yes No I feel that children should never "make a mess" when they draw or paint.
24. Yes No I think it is as important for girls to learn to draw or write as to cook and sew.
25. Yes No I only like to draw pictures of real persons or objects.
26. Yes No If other children laugh at your ideas, you should give the ideas up.
27. Yes No I think children can write good poetry.
28. Yes No I like kids who are quiet and well behaved better than ones who joke and clown around a lot.
29. Yes No I would rather have as a friend someone who is lively and full of ideas than someone who is nice and always wants to do what I want.
30. Yes No I usually try to think up new ways of doing things rather than doing them in the accepted way.
31. Yes No In school I prefer to learn facts rather than talk about ideas and theories that people have about things.
32. Yes No I like drawing No. 1 better than No. 2 (Note: drawing #1 is an abstract line drawing while the other is of a couple trees situated on a hillside).

Verbal Insight Problems

1. Prisoner: A prisoner was attempting to escape from a tower. He found in his cell a rope, which was half long enough to permit him to reach the ground safely. He divided the rope in half and tied the two parts together and escaped. How could he have done this?

Source:

Solution: *Unwind the rope and tie the ends together*

2. Hole: How can you cut a hole in a 3 x 5 card that is big enough for you to put your head through?

Source:

Solution: Cut a spiral out and unwind it

3. Twins: Marsha and Marjorie were born on the same day of the same month of the same year to the same mother and the same father - yet they are not twins. How is that possible?

Source:

Solution: *They are triplets*

4. Children: Three women - Joan, Dana, and Sandy - have among them three children - Sam, Traci, and David. Sam likes to play with Dana's son. Sandy occasionally baby-sits for Joan's children. Who is Traci's mother?

Source:

Solution: *Joan*

5. Basketball: Our basketball team won a game last week by the score of 73-49, and yet not even one man on our team scored as much as a single point. How is that possible?

Source:

Solution: *It was a woman's team.*

6. Pile: A child playing on the beach has 6 sand piles in one area and 3 in another. If he put them all together, how many sand piles would he have?

Source:

Solution: *One*

7. Dancing: Three couples went together to a party. One woman was dressed in red, one in green, and one in blue. Each man was wearing one of these colors. When all three couples were dancing, the man in red was dancing with the woman in blue. "Isn't it funny Christine, not one of us is dancing with a partner dressed in the same color." Think about the man who is dancing with the woman in red. What color is he wearing?

Source:

Solution: *Green. Since the man in blue is dancing with the woman in red the man in green has the choice of either the woman in red or green (he cannot dance with green so he is dancing with the woman in red).*

8. Coin: One archaeologist reported finding a Roman coin with Julius Caesar's image on it, dated 21 B.C. Another archaeologist correctly asserted that the find was a fraud. Why?

Source:

Solution: *Prior to the start of B.C. coins were not minted with B.C. - it wasn't a known abbreviation*

9. Widow: Is it legal for a man to marry his widow's sister? Why or why not?

Source:

Solution: *no he is dead*

10. Box: What was Lewis Carroll talking about in this poem? John gave his brother James a box: About it there were many locks. James woke and said it gave him pain; So he gave it back to

John again. The box was not with lid supplied, Yet caused two lids to open wide. And all these locks had never a key - What kind of box, then, could it be?

Source:

Solution: *A box is a slap on the head*

11. Words: Rearrange the following patterns to make familiar words:

runghy

flymia

mulcica

domev

lendraca

Source:

Solution:

runghy → *hungry*

flymia → *family*

mulcica → *calcium*

domev → *vendor*

lendraca → *calendar*

12. Flash: The legendary runner Flash Fleetfoot was so fast that his friends said he could turn off the light switch and jump into bed before the room got dark. On one occasion Flash proved he could do it. How?

Source:

Solution: *He went to bed during the day*

13. Plums: A farmer in California owns a beautiful pear tree. He supplies the fruit to a nearby grocery store. The store owner has called the farmer to see how much fruit is available for him to purchase. The farmer knows that the main trunk has 24 branches. Each branch has exactly 6 twigs. Since each twig bears one piece of fruit, how many plums will the farmer be able to deliver?

Source:

Solution: *None, it was a pear tree.*

14. Christmas: In what year did Christmas and New Year's fall in the same year?

Source:

Solution: *Every year*

15.: How many cubic centimeters of dirt are in a hole 6 meters long, 2 meters wide and one meter deep?

Source:

Solution: *Zero: there is no dirt in a hole.*

16. Captain: Captain Scott was out for a walk when it started to rain. He did not have an umbrella and he wasn't wearing a hat. His clothes were soaked yet not a hair on his head got wet. How could this happen?

Source:

Solution: *He is bald.*

17. Invention" There is an ancient invention still used in parts of the worlds today that allows people to see through walls. What is it?

Source:

27. Unlisted: There is a town in Northern Ontario where 5% of all the people living in the town have unlisted phone numbers. If you selected 100 names at random from the town's phone directory, on average, how many of these people selected would have unlisted phone numbers?

Source:

Solution: *None, unlisted phone numbers are not in the directory.*

28. Safari: While on safari in the wild jungles of Africa, Professor White woke one morning and felt something in the back pocket of her shorts. It had a head and a tail but no legs. When White got up she could feel it move inside her pocket. White however showed little concern and went about her morning rituals. Why such a casual attitude toward the thing in her pocket?

Source:

Solution: *It was a coin.*

29. Professor: Professor Bumble, who is getting on in years is growing absent minded. On the way to a lecture one day he went through a red light and turned down a one way street in the wrong direction. A policeman observed the entire scene but did nothing about it. How could Professor Bumble get away with such behavior?

Source:

Solution: *He was walking*

30. Window washer: A window washer was cleaning the windows of a high rise building when he slipped and fell off a sixty-foot ladder onto the concrete sidewalk below. Incredibly he did not injure himself in any way. How was this possible?

Source:

Solution: *He fell off the first rung of the ladder*

31. Boat: If a boat, at low tide, has 6 of it's 12 ladder steps in the water. How many ladder steps will be in the water a high tide?

Source:

Solution: *6 - the boat floats.*

32. Saint Ives: While I was traveling to Saint Ives, I met a man with 7 wives, the 7 wives had 7 sacks, and the 7 sacks had 7 cats, the 7 cats had 7 kittens. Kittens, Cats, Sacks, Wives, how many were going to Saint Ives?

Source:

Solution: *One (the others were just met on the road).*

33. Jail: A man goes to visit another man in jail, the guard tells the visitor that only family members are allowed to visit inmates, the visitor declares " brothers, sisters I have none, but that man's father is my father's son." Who is the visitor?

Source:

Solution: *The inmate's father.*

34. Whoever: Whoever makes it doesn't use it, whoever buys it doesn't want it and whoever uses it doesn't know it?

Source:

Solution: *A coffin.*

35. Car accident: A father and his son get in a car accident. The father is sent to one hospital, and the son is sent to another. When the doctor comes in to operate on the son, the doctor says, "I cannot operate on him. He is my son." How can that be?

Source:

Solution: *The doctor is the mother.*

36. Reading: Solve: |r|e|a|d|i|n|g|

Source:

Solution:

37. Eternity: What is at the beginning of eternity, the end of time and space. The beginning of every end, the end of every place.

Source:

Solution: *Reading between the lines.*

38. Months: How many months have twenty-eight days in them?

Source:

Solution: *All of them.*

39. Gears: Professor Gray was driving along in her old car when suddenly it shifted gears by itself. She paid no attention and kept on driving. Why wasn't she concerned?

Source:

Solution: *The car is an automatic.*

40. Cabin: Erin stumbles across an abandoned cabin one cold, dark and snowy night. Inside the cabin is a kerosene lantern, a candle, and wood in a fireplace. She only has one match. What should she light first?

Source:

Solution: *The match.*

Mathematical Insight Problems

1. Smith Family: In the Smith family, there are 7 sisters and each sister has 1 brother. If you count Mr. Smith, how many males are there in the Smith family?

Source:

Solution: *Two (the father and the brother)*

2. Water lilies: Water lilies double in area every 24 hours. At the beginning of summer there is one water lily on the lake. It takes 60 days for the lake to become completely covered with water lilies. On which day is the lake half covered?

Source:

Solution: *Day 59 then it doubles on the 60th*

3. Socks: If you have black socks and brown socks in your drawer, mixed in a ratio of 4 to 5, how many socks will you have to take out to make sure that you have a pair the same color?

Source:

Solution: *Three - if the first is brown and the second black then the third one will match either the brown or black.*

4. Eyes: Yesterday I went to the zoo and saw the giraffes and ostriches. Altogether they had 30 eyes and 44 legs. How many animals were there?

Source:

Solution: *15 (30 eyes each animal has 2 eyes = 30/2)*

5. Horse: A man bought a horse for \$60 and sold it for \$70. Then he bought it back for \$80 and sold it for \$90. How much did he make or lose in the horse trading business?

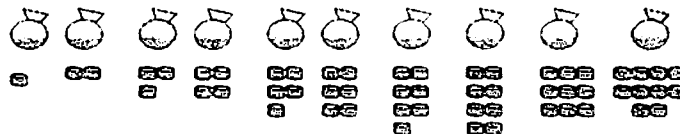
Source:

Solution: *\$20: made \$10 on the first deal and \$10 on the second deal.*

6. Weights: There are ten bags, each containing ten weights, all of which look identical. In nine of the bags each weight is 16 ounces, but in one of the bags the weights are actually 17 ounces each. How is it possible, in a single weighing on an accurate weighing scale, to determine which bag contains the 17-ounce weights?

Source:

Solution: *Take 1 from the 1st bag, 2 from the 2nd, 3 from the 3rd etc. Then weigh all those coins. If all the bags weigh 16 ounces you will have 55 ounces (10+9+8+7+6+5+4+3+2+1). Any amount in excess of the 55 ounces will determine which bag contains the 17 ounces (two ounces over = bag 2, if it is 7 ounces over = bag 7 etc)*



7. Price: What is the minimum number of coins you need to be able to pay the exact price of any item costing anywhere from one cent up to one dollar? The coins are pennies (1 cent), nickels (5

cents), dimes (10 cents), quarters (25 cents) and half dollars (50 cents)?

Source:

Solution: *8 (four pennies, one nickels, two dimes, one quarters, and one half dollar).*

8. Frog: A frog fell into a well thirty-two feet deep. Each day he jumped two feet up the wall and slid back down one foot each night. How many days did it take him to jump out of the well?

Source:

Solution: *30 (not 31 - he didn't slide back down once he was out).*

9. Coins: Which would be worth more, a pound of \$10 pure gold coins or half a pound of \$20 pure gold coins; or would they be worth the same? Explain your answer.

Source:

Solution: *A pound of gold is worth more than half a pound.*

47. It is estimated that the earth weighs 6 sextillion tons. How much more would the earth weigh if 1 sextillion tons of concrete and stone were used to build a wall?

Source:

Solution: *Still 6 sextillion (the concrete and stone were already part of the earth when it was weighed)*

55. Fill in the blank:

2, 4, 6, 30, 32, 34, 36, 40, 42, 44, 46, 50, 52, 54, 56, 60, 62, 64, 66, ___?

Source:

Solution: *2000 (it is the next number without an "e" in it).*

65. A man had a 2 dollar bill and wanted to buy a train ticket that cost 3 dollars. He took the 2 dollar bill to a pawn shop where he pawned it for \$1.50. On the way to the train station, he met a friend to whom he sold the pawn ticket for \$1.50. He then had 3 dollars with which to buy his ticket. Who was out the extra dollar?

Source:

Solution: *The friend. He paid \$1.50 for a pawn ticket. He still has to pay \$1.50 at the pawnshop to get the 2 dollar bill, so he has spent \$3 for a \$2 bill.*

Verbal Logic Problems

1. Prisoner: A prisoner was attempting to escape from a tower. He found in his cell a rope, which was half long enough to permit him to reach the ground safely. He divided the rope in half and tied the two parts together and escaped. How could he have done this?

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8. Coin: One archaeologist reported finding a Roman coin with Julius Caesar's image on it, dated 21 B.C. Another archaeologist correctly asserted that the find was a fraud. Why?

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Source:

Solution: *None, it was a pear tree.*

14. Christmas: In what year did Christmas and New Year's fall in the same year?

Source:

Solution: *Every year*

15.: How many cubic centimeters of dirt are in a hole 6 meters long, 2 meters wide and one meter deep?

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Solution: *Zero: there is no dirt in a hole.*

16. Captain: Captain Scott was out for a walk when it started to rain. He did not have an umbrella and he wasn't wearing a hat. His clothes were soaked yet not a hair on his head got wet. How could this happen?

Source:

Solution: *He is bald.*

17. Invention” There is an ancient invention still used in parts of the worlds today that allows people to see through walls. What is it?

Source:

Solution: *A window*

18. Rock: If you drop a rock, would it fall more rapidly through water at 40 degrees Fahrenheit or 20 degrees Fahrenheit? Why?

Source:

Solution: *40 degrees Fahrenheit, because water is frozen solid at 40 degrees.*

19. Mr. Shadow: Mr. Shadow opened the door to Dr Apple's office and surveyed the scene. Dr Apple's head lay on her desk in a pool of blood. On the floor to her right lay a gun. There were powder burns on her right temple indicating that she was shot at close range. On her desk was a suicide note and in her right hand the pen that had written it. Mr. Shadow noted that death had occurred in the past hour. He also realized that it had not been a suicide but a clear case of murder. How does Mr. Shadow know?

Source:

Solution: *If she has killed herself the last thing in her right hand would have been the gun, not a pen.*

20. Married: A man who lived in a small town in the United States married 20 different women of the same town. All are still living and he never divorced any of them. In this town polygamy is unlawful; yet he has broken no law. How is this possible?

Source:

Solution: *He was the minister presiding over the wedding ceremony.*

21. Coffee: One morning a woman's earring fell into a cup that was filled with coffee, yet her earring did not get wet. How could this be?

Source:

Solution: *The earring fell into coffee grounds.*

22. Feathers: Paul is carrying a pillow case full of feathers. Mark is carrying three pillow cases the same size as Paul's, yet Mark's load is lighter. How can this be?

Source:

Solution: *Aaron's pillowcases are empty.*

23. Magician: A magician claimed to be able to throw a ping pong ball so that it would go a short distance, come to a dead stop, and then reverse itself. He also added that he would not bounce the ball against any object or tie anything to it. How could he perform this feat?

Source:

Solution: *He threw it up in the air.*

24. Superpsychic: A famous superpsychic could tell the score of any baseball game before it starts. What was his secret?

Source:

Solution: *The starting score is always 0 to 0.*

25. Calendars: Calendars made in England do not show Lincoln's birthday. Do these calendars show the fourth of July? Explain.

Source:

Solution: *Yes, every calendar has a fourth of July.*

26. Fishing: Two mothers and two daughters were fishing. They managed to catch one big fish, one small fish, and one fat fish. Since only three fish were caught how is it possible that each woman had her own fish?

Source:

Solution: *There are only three women (grandmother, mother, and daughter) the mother is a daughter too.*

27. Unlisted: There is a town in Northern Ontario where 5% of all the people living in the town have unlisted phone numbers. If you selected 100 names at random from the town's phone directory, on average, how many of these people selected would have unlisted phone numbers?

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Source:

Solution: *The doctor is the mother.*

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Source:

Solution:

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Solution: *The car is an automatic.*

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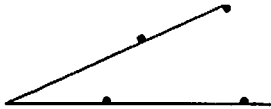
Source:

Solution: *The match.*

1. 4 dots: Without lifting your pencil from the paper, show how you could join all 4 dots with 2 straight lines



Source:
Solution:



2. Trees: A landscaper is given instructions to plant four special trees so that each one is exactly the same distance from each of the others. How is he able to do it?

Source:

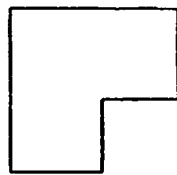
Solution: *Plant them on a hill: three at the base one on the top (like the four corner points on a pyramid)*

3. Chain: A woman has four pieces of chain. Each piece is made up of three links. She wants to join the pieces into a single closed loop of chain. To open a link costs 2 cents and to close a link costs 3 cents. She only has 15 cents. How does she do it?

Source:

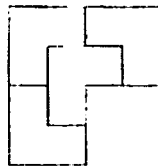
Solution:

4. Figure: Show how you can divide this figure into four equal parts that are the same size and shape



Source:

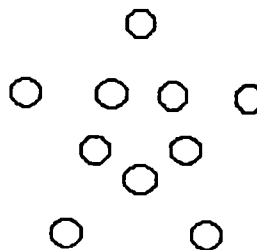
Solution:



5. Pennies: Show how you can arrange 10 pennies so that you have 5 rows (lines) of 4 pennies in each row.



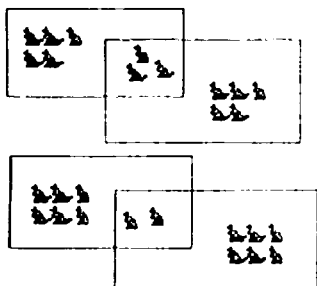
Source:
Solution:



6. **Pens:** Describe how to put 27 animals in 4 pens in such a way that there is an even of number of animals in each pen.

Source:

Solution: Allow some animals to count twice in two pens

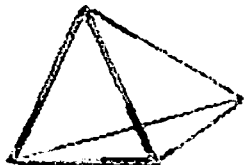


7. **Pencils:** How can you arrange 6 identical pencils in such a way as to form 4 identical triangles whose sides area are all equal, without modifying the pencils in any way?



Source:

Solution: Make a pyramid, three on the base and three on the sides



8. Series: Identify the next term in the series:

88 ... 64 ... 24 ...

Source:

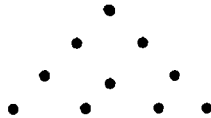
Solution:

9. Cards: Three cards lie face down on a table, arranged in a row from left to right. We have the following information about them. a. The Jack is to the left of the Queen b. The Diamond is to the left of the Spade c. The King is to the right of the Heart d. The Spade is to the right of the King. Which card - by face and suit - occupies each position?

Source:

Solution:

10. Triangle: The triangle shown below points to the top of the page. Show how you can move three circles to get the triangle to point to the bottom of the page.



Source:

Solution:

11. Letter Z:

A EF HI KLMN T VWXY

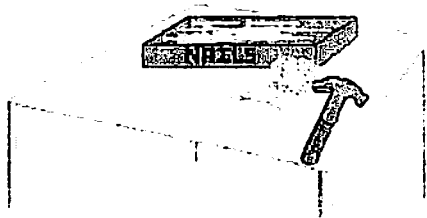
BCD G J OPQRS U

Can you figure out where to put the letter Z, top or bottom line and Why?

Source:

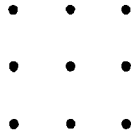
Solution:

12. Candle: Given the material below how can you attach the candle to the wall above the table so that the wax does not drip on the table?



Source:
Solution:

13. The 9 Dots: Draw four continuous straight lines, connecting all the dots without lifting your pencil from the paper.



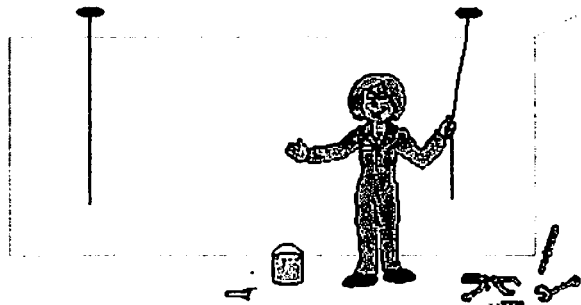
Source:
Solution:

14. Tumor: Imagine you are a doctor treating a patient with a malignant stomach tumor. You cannot operate but you must destroy the tumor. You could use high intensity X rays to destroy the tumor but unfortunately the intensity of the X rays needed to destroy the tumor also will destroy healthy tissue through which the X rays must pass. Less power full X rays will spare the healthy tissue but will not be strong enough to destroy the tumor. How can you destroy the tumor without damaging the healthy tissue?

Source:
Solution:

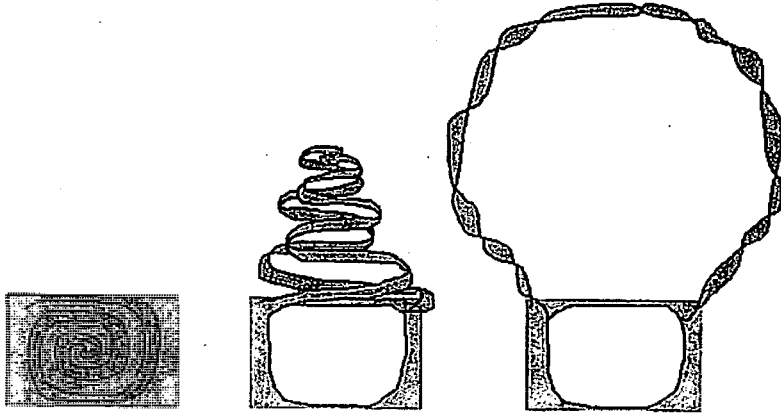
15. Strings: There are two strings hanging from the ceiling in the room below. The woman cannot reach both. How can she tie the two strings together?

Source:
Solution:



16. Hole: An example of a spatial insight problem is “How can you cut a hole in a 3 x 5 card that is big enough for you to put your head through?” (The novel approach involves turning the flat 3x5 card into a three dimensional object by creating two concentric spirals and then unwrapping them).

Source:
Solution:



Matching:

- a. Critical/Critical thinking
- b. Creative/Creative thinking
- c. Cooperative/Cooperative learning

Questions:

- _____ 1. "The _____ individual has a certain freedom of spirit and unwillingness to be bound by the unwritten canons of society, characteristics not necessarily found in the highly intelligent individual. Implicit theories of _____ encompass a dimension of aesthetic taste and imagination that is absent in implicit theories of intelligence, and also encompass aspects of inquisitiveness and intuitiveness that do not seem to enter into implicit theories of intelligence" (Sternberg, 1986).
- _____ 2. "_____ thinking calls for a persistent effort to examine any belief or supposed form of knowledge in the light of evidence that supports it and the further conclusions to which it tends (Glaser, 1941)."
- _____ 3. "_____ thinking...is a process of evaluation or categorization in terms of some previously accepted standards. It is a logical examination of data which avoids fantasies and judgments on an emotional basis only (Russell, 1960)."
- _____ 4. _____ is the "cognitive abilities that produce original idea combinations in people and generate new knowledge and problem solving techniques" (Gallini, 1983).
- _____ 5. "an equal partnership in which paired students study together with the mutual goal of mastering academic material" (Larson & Dansereau, 1986, p. 516).
- _____ 6. _____ "may be defined, quite simply, as the ability to bring something new into existence" (Barron, 1969).
- _____ 7. _____ includes defining a problem, selecting pertinent information, recognizing stated and unstated assumptions, formulating and selecting relevant hypotheses, drawing conclusions, and detecting bias in statements.
- _____ 8. "_____ is more than mere spontaneity for it involves deliberation as well. It is more than divergent thinking for it converges on some solution. It not only generates possibilities but also chooses among them. It is as much asking the right question as finding the right answer" (Young, 1985).
- _____ 9. "_____ thinking is reflective and reasonable thinking that is focused on deciding what to believe or do (Ennis, 1985); "...at its' root, it "is the correct assessment of statements" (Ennis, 1962).
- _____ 10. The _____ thinker tries to be well-informed, takes into account the total situation, seeks a clear statement of the thesis or the question, looks for alternatives, deals with components of the problem in an orderly manner, seeks as much precision as the subject matter will allow, asks clarifying questions when confused, and judges conclusions (Presseisen, 1986).

True/False (T/F):

11. ____ Creative thinking aims to produce an assessment of things, beliefs, and courses of action, while critical thinking aims to produce an original product (Perkins, 1987).
12. ____ Perkins and Glaser hold that attitudes or dispositions are the backbones of creative and critical thinking; certain dispositional qualities like an inquiring mind, a need to evaluate information, a willingness to test one's opinion, and a desire to consider alternate points of view, appear to link these two types of thinking.
13. ____ There is an overlap between the two (i.e., critical and creative thinking) since creative thinking involves innumerable episodes of evaluating solutions and critical thinking depends on inventions and ways of breaking one's mental set.
14. ____ Creative people do more than break away from old and familiar patterns and listing numerous alternatives; they have goals that they use to assist them in converging on new solutions.
15. ____ As suggested by Isaksen and Parnes (1985), all human intellectual abilities and emotional energies could be united in attacking problems or challenges in a reciprocating pattern between imagination and judgment. They have outlined a six stage problem solving model wherein each stage includes a **divergent phase** (free flow of thoughts) and a **convergent phase** (evaluation and selection of thoughts).

16. What is your personal definition of creativity?

17. Write a new witty title for this Davis' book.

18. What do creative people do? How can we spot a creative person?

19. **Circle creative thinking terms and place a check next to critical thinking terms:**

- a. displays curiosity, b. predicts consequences, c. determines relevance and irrelevance of information, d. elaboration, e. visualization, f. seeks support for opinions and hypotheses, g. recognizes appropriate conclusions and implications, h. nonconforming, i. is flexible, j. unpredictable/spontaneous, k. makes comparisons and contrasts, l. answers and solutions are unique, m. provides justification, n. finds patterns, o. analyses assumptions, p. states and defends ideas, q. identifies alternatives, r. attracted to novelty, s. sees new angles or patterns, t. classifies and categories, u. risk taking, v. distinguishes relationships, w. tolerance for ambiguity, x. makes analogies, y. breaks mental set, z. checks credibility of sources, aa. checks reliability and adequacy of information provided, bb. imagination, cc. detects missing parts of an argument, dd. has a sense of humor, ee. determines the strength of an argument.

CRITICAL

THINKING:

THEORY,

TECHNIQUES,

AND

ASSESSMENT

Critical Thinking:

(A Common Quote: Don't Be Soooooo Critical!)

a. **Critical Thinking Definition:** Robert Glaser (1941): "Critical thinking calls for persistent effort to examine any belief or supposed form of knowledge in the light of evidence that supports it and the further conclusions to which it tends." (i.e., seek justification, recognize relationships, anal credibility of sources, looks at reasons/evidence, drawing inferences, identifying alternatives, logical deductions, sequences and order, defending an idea.)

b. 10+ Critical Thinking Ideas:

1. **Critiques, Reviews, Reflexive Papers, Rebuttals, Rejoinders, Replies**
(Recent decisions: Analyze new state testing requirements, evaluate a coop learning approach)
2. **K-W-L, Pros and Cons, Pluses/Minuses/Interesting (PMI)**
(What do you know?, What want to know?, What did you learn here?; How's is XYZ?)
3. **Voting or Ranking Methods, Nominal Group Process**
(Contribute ideas and then categorize and rank them; e.g., what technology resources does the school need? What are the goals of this school?)
4. **Pruning the Tree (20 q's); Working Backward, Means-Ends Analysis (From answer to problem)**
(The answer to the question is "X"...now how did I get that?)
5. **Minute Papers, Reflection Logs, Think Sheets, Guided Questioning**
(The muddiest point of the presentation today was...)
6. **Graphic Organizers, Flowcharts, Concept Maps, Venn Diagrams, Decision-Making Trees**
(main ideas, advantages and disadvantages, what's overlap between two ideas)
7. **Mock Trials, Who Done Its, Detective Games, Murder Mysteries**
(put a famous scientist or ruler on trial for a crime and analyze the evidence)
8. **Debates, Examine Both Sides of Argument, Force Field Analysis**
(protecting the spotted owl, cutting of valuable timber, should we use coop lrng in schools?)
(what are 3 arguments for learner-centered principles and 3 arguments against them?)
9. **Case-Based Reasoning**
(Case A, Case B; Case & Commentaries; Cumulative Case; Critical Instance; Condensed)
(students solve a problematic vignette)
10. **Summing Up (Summaries, Reviews, Index Cards, Abstracts, Outlines, Nutshelling)**
(at the start of each lecture, spend 5 minutes summarizing previous day lectures or readings)
11. **Other techniques**
 - **Classification Schemes, Taxonomies (Put the data you have collected into a grid....)**
 - **Categorize and Organize (Categorize the articles you read into ...)**
 - **Identifying Main Points, Key Priorities**
 - **Compare and Contrast Matrices**
 - **Goal Concretization (give a story endings or fable)**
 - **Alternatives, Possibilities, Choices**
 - **Find Patterns/Relationships**
 - **Other Points of View**
 - **Cost-Benefit Analysis**
 - **Rank Ideas**

25 Critical Thinking Techniques (P506: Bonk & Maholmes--Day 5):

(i.e., seek justification, recognize relationships, anal credibility of sources, looks at reasons/evidence, drawing inferences, identifying alternatives, logical deductions, sequences and order, defending an idea.)

Robert Glaser (1941): Critical thinking calls for persistent effort to examine any belief or supposed form of knowledge in the light of evidence that supports it and the further conclusions to which it tends.

Ennis (1962): Critical thinking is the correct assessing of statements...and it is reflective and reasonable thinking that is focused on deciding what to do or believe.

Russell (1960): Critical thinking...is a process of evaluation or categorization in terms of some previously accepted standards. It is a logical examination of data which avoids fantasies and judgments on an emotional basis only.

Visual Thinking Activities:

1. Graphic Organizers--sequence chains, cause-eff, main ideas, sim/diff, story maps, diagram
2. Idea/Concept/Word Sorts--categories into meanings, themes, and patterns
3. Classif/Categorization Schemes, Taxonomies, Epitomes, Adv. Organ, Compar-Contrast
4. Semantic Feature Analysis (evaluate +, -, ? of that feature on a grid)
5. Mnemonics--story, link, acronyms, acrostic, bizarre, mnemonies

Writing Activities:

6. Summing Up: Critiques, Summaries, Reviews, Index Cards, Abstracts, Outlines, Nutshell
7. Guided or Focused Learning/Journal Logs
8. Think Sheets or Cards, Reflection Questions, Procedural/Substantive Facilitators
9. Goal Concretization; e.g., providing Story Ending, Moral, Fable, Joke, Tale, or Riddle
10. Other Writing to Think Activities; e.g., Conferencing, Peer Review, Revising

Idea Listing Activities:

11. Force Field Analysis, Plus-Minus-Interesting (PMI)
12. Other Points of View (OPV) (if ___ became the president of _____),
13. K-W-L (What do you know?, What want to know?, What did you learn?)
14. Alternative, Possibilities, and Choices (APC);
15. Considering All Factors and Consequences, Examining Both Sides of an Argument

Group Interaction Activities:

16. Chkg for Compreh/Understanding--literal knowledge, comprehension, interpret, applic Bloom's Taxonomy, 3 Level Q'ing/Guides, Preview Q's, Guided Rdg, QARs, DR-TA
17. Debates, Trials, Focused Dialogues, Structured Controversy
18. Identifying Main Pts: Previewing, PreP, Predictions, Expectation Outlines
19. Cost-Benefit Analyses
20. Pruning the Tree--20 q's, Means-Ends Analysis, Working Forward, Working Backward

Teaching/Process-Product Oriented Activities:

21. Socratic/Inquiry Questioning
22. Think Alouds/Modeling/Self-Verbalizations of Process
23. Case-Based Reasoning/Learning, Rule-Eg, Eg-Rule, Case-and-Commentaries
24. Cooperative Learning--ReQuest, Reciprocal Teaching, Jigsaw, Coop. Scripts
25. Anchored Instruction, Shared Events/Meanings, Knowledge Building Communities

If all else fails, give a whack in side of the head or a kick in the seat of the pants (e.g., whack stack--cards).

Want to reason like a genius? Try these...

Seven Steps to Better Thinking

BY MORTON HUNT

THE DIFFERENCE BETWEEN brilliant and dull thinking lies not so much in our mental equipment as in how well we use it. By applying the right mental skills, people of average intelligence can at times act like geniuses. Dr. Edward de Bono, a psychologist and professor of investigative medicine at Cambridge University, England, and co-author of *The Learn-To-Think Coursebook*,^{*} has assembled a set of simple skills for improving thinking. His system has been adopted by corporate executives, taught in schools and studied by government officials from a score of nations. "Genius," de Bono says, "lies in solving the problems of everyday life—and everyone can get better at it." Here are his seven basic tools.

1. Plus, Minus, Interesting. The crucial first step in better thinking is to see things without limiting your vision. Try this experiment: look around the room for red objects. (Don't read on until you've done so.) Now close your eyes and ask yourself how many green objects there are. Look again. Surprised? It was your focused attention on red that kept you from noticing things of another color.

It's the same with an idea. When most of us first hear a new idea or a new solution to a problem, we react instinctively by either liking it or disliking it. Then we use our intelligence to defend that viewpoint. An easy way to escape this trap is to do a PMI. De Bono illustrates the technique with this example: in a discussion about the design of public buses,

^{*}2nd Edition, copyright © 1974 by the Edward de Bono School of Thinking, by Edward de Bono and Michael de Saint-Arnaud, is published at \$19.95 by the Edward de Bono School of Thinking, New York, N.Y.

someone suggests taking out all the seats. What's your reaction? Why?

Whatever you said, now take another look at the matter, this time using PMI. Spend three minutes writing down every good point you can make about this idea, every bad point, and every point that is neither good nor bad but simply interesting.

Most people are surprised to find that they generate eight or ten Pluses (including some that aren't so obvious such as, "Buses would be cheaper and easier to repair"), as many Minuses, and a handful of Interesting (such as, "Comfort may not be so important in a bus").

The aim of doing a PMI is to achieve *broadmindedness* in our thinking, rather than remaining the obedient servant of our own prejudices. To put it another way: the PMI is an attention-expander; it prevents us from seeing only red.



2. Considering All Factors. This tool is a conscious effort to make sure you've thought of everything that might be relevant in making a decision. Suppose you're thinking about buying a new house. Do a CAF to be sure you ask all the right questions. While obvious issues such as size, cost and layout are bound to come to mind, without a deliberate effort to list every relevant factor you might overlook others. How good is TV reception? Is there a local leash law? Can the

pipes be drained quickly in case of a power failure in freezing weather?

A couple I know were about to buy a house during the summer. Then a friend asked how the area would look when the leaves were down. It turned out that without the leaves, they'd have a view of a pile of wrecked cars.



3. Consequences & Sequel. While PMI and CAF open all sorts of possibilities, C&S helps us to judge which are the best. One of the traits that makes us different from animals is our ability to imagine the outcome of our actions. But we can greatly improve this ability by learning to use it in a systematic way. The de Bono technique is to imagine the probable outcome of a decision at four distances in the future: immediate, short term (1 to 5 years), medium term (5 to 25 years) and long term (over 25 years).

In his courses de Bono asks such questions as, "What if the world runs out of oil?" or "What if a new electronic robot replaces human labor in factories? Imagine the consequences." Students are astonished to see how their predictions of immediate and short-term effects lead them on to perceive longer-term possibilities. Soon they acquire enough skill to apply the method to decisions in their own lives.

A friend of mine would be far happier if he had used that skill. A number of years ago, married and

Critical Thinking Skills (Brief Bonk Brainstorm, 1991)

Robert Glaser (1941): Critical thinking calls for persistent effort to examine any belief or supposed form of knowledge in the light of evidence that supports it and the further conclusions to which it tends.

Classifying

Taking Other Points of View

Following Rules

Predicting Outcomes

Estimating, Guessing

Setting Goals and Objectives

Recognizing Patterns

Discovering Relationships

Part-Whole Relationships

Forming Hypotheses

Finding Errors

Asking Questions

Discovering Relationships

Sequencing

Following Directions

Considering Relevance

Predicting Consequences

Determining Appropriateness

Planning

Means-End Relationships

Cause-Effect Relationships

Considering Implications

Making Decisions

Evaluating Generalizations

Discovering Trends

Making Inferences

Ordering on Salient Dimensions

Questioning--Analysis, Evaluation, Synthesis, and Interpretation

Interpreting

Comparing and Contrasting

Visualizing

Setting Criteria

Measuring

Justifying

Analyzing Assumptions

Recognizing Essential/Nonessential

Recognizing Assumptions, Beliefs, Opinions

Mnemonic Learning/Memory Strategies

Reading Charts, Graphs, Tables

Determining Relevance and Irrelevance

Analyzing the Current Situation and Where You Wish to End

Generating Graphs from Data

Detecting Reasoning Errors

Arguing Persuasively, Logically

Communicating Clear Relationships

Sequencing Appropriate Information

Stating and Defending an Idea

Identifying Needed Processes, Information

Problem Clarification and Definition

Identifying Alternatives

Attribute Listing

Finding Patterns

Analyzing Truth Claims
Credibility of Sources, Bias
Analyzing for Personal Agenda
Identifying Assumptions vs. Inferences
Seeking Support for Opinions, Hypotheses

Cost-Benefit Analysis

Identifying Ways to Overcome Barriers
Identifying Components of a Process
Analyze Significance of Information Presented
Significance of Findings
Analyze Completeness and Clarity of Information Presented

Themes

Interrelationships of Literary Elements
Elements of and Event

Evaluate Soundness of Procedures

Pose Hypothesis

Test Explanations

Evaluate Believability of a Story, Information

Define Essential Elements

Analyze Part-Whole Relationships

Evaluating Inferences

Following Logically Valid Lines of Reasoning

Discerning the Relevance of Objections

Recognizing Appropriate Conclusions

Evaluate Reasons from a Claim

Checking Reliability and Adequacy of Information

Detecting Missing Parts of an Argument

Judging Whether Certain Statements Contradict each other or follow each other

Judging Whether the Problem has been Identified

Judging Whether a Definition is Adequate

Judging Whether a Statement Made by an Alleged Authority is Acceptable

Examining Both Sides of an Argument

Prioritizing (relevant factors, objectives, and consequences)

Focusing on Different Aspects of a Situation

Being Right by Referring to the Facts or an Authority

Recognizing Contradictory Information

Understanding Values Determine Thinking

Simplifying and Clarifying Unnecessarily Complex and Confusing Information

Recognizing Given and Omitted--but needed--Information

Matching Shapes

Classifying by Shape

Matching Similar Figures

Dividing Shapes into Equivalent Parts

Matching Classes by Pattern

Selecting Synonyms

Writing Directions

Completing Phrases

Describing Characteristics

Finding Shape Exceptions

Matching Pattern Pieces

Figural Sequence Problems

Classes and Members

Explaining Exceptions

Distinguishing Relationships

Sorting into Word Classes

Judging Whether a Statement is Specific Enough

Grasping the Meaning of a Statement

Classroom Assessment Techniques: How can I tell what students are thinking?

Joan Middendorf and Alan Kalish

There are several ways to answer this important question. A general answer is that students often have enough time on their hands, even as they sit in class and listen, to think about several things at the same time. None of us puts 100 percent of our attention to a lecture for long periods of time. Instead, attention waxes and wanes.

We also know that students have seven developmental tasks they are working on during the college years: achieving intellectual, physical, and social competence; managing emotions; becoming autonomous; establishing identity; managing interpersonal relationships; clarifying purpose; and developing integrity (Chickering, 1969). At times, students are probably thinking about these other things, rather than about purely intellectual pursuits.

But good teachers will also want to know a more specific answer. In fact, a set of techniques has been developed to get at the question, "What are students thinking?" They are called Classroom Assessment Techniques (CATs), and were developed by Angelo and Cross (1993). There are many varied CATs that can be used. The most important thing is that they are quick to use, easy to interpret, and provide a wealth of information about our students' thinking, so we can have a better idea of what is going on with our students.

Using a CAT is a little like asking a research question. Is there something you would like to know about your specific students in your specific course? CATs can get at:

- What do students come to my course knowing (or thinking they know)?
- What are they thinking at any moment in class?
- What did they get out of today's class compared to what I wanted them to get?
- What are they thinking when they study (or how did they go about answering a problem)?

CATs are feedback devices to help us determine how much, how well, and simply how our students learn. TRC staff can help you identify the question you would like to ask about your students' learning and adapt a CAT to your topic. Many faculty on the Bloomington campus are beginning to use them regularly. Two faculty describe their experiences in the articles below.

References

- Angelo, T. A., and Cross, K. P. (1993). *Classroom Assessment Techniques: A handbook for college teachers*. San Francisco: Jossey-Bass.
- Chickering, A. (1969). *Education and identity*. San Francisco: Jossey-Bass.

Minute Papers in a Large Class

James Craig, Dept. of Psychology

I have been using Minute Papers in my Introductory Psychology class for the past four years. The class has 250 students, mostly freshmen. After each lecture, a third of the students are assigned to respond to the lecture via one of the computer clusters. Students can do one of two things: they can indicate what was least clear to them from the lecture, or give a personal example that illustrates some concept from the lecture or the textbook.

The Minute Papers typically reveal two or three major questions on the part of students, which I answer at the beginning of the next lecture. I have found that the students pay more attention to the answers if I put the question on an overhead. Also, writing the question on an overhead tells the students the answer is not directed only at the person who asked it. Answering their questions at the next class lets students know that they are not the only ones with that question and also gives students a sense that they have some control over the direction of the course.

Student-Generated Test Questions

Francisco Silva, Dept. of Psychology

One goal I had for The Psychology of Motivation was that students develop a high-level, integrative understanding of phenomena, procedures, data, and conceptual issues. However, I wasn't sure that the average student could perform at this level. Therefore, I needed some teaching/learning aid that would help students with less effective study habits. Specifically, I thought that students needed to have a reason to regularly review and think about course content. The procedure that I implemented provided a small, immediate incentive that would lead to a bigger, delayed payoff.

The Procedure: Student-Generated Test Questions
Students were asked, but not required, to prepare 2 essay questions following each class. The questions had to be based on material that was covered in the previous class, or from the related text. Also, students had to provide answers for their questions.

At the beginning of each class, I would randomly select a student to present one of their questions and answers.

Page 298

"Minute Papers" continued

Some students use the Minute Papers to give examples, which can inform my teaching. I asked students if they knew anyone who had suffered brain damage and what effects had they observed in the person's behavior. By the students' responses I knew I could refer them to some of the common causes and consequences of brain damage and be confident that most of the students would have some direct knowledge of them.

Instructors should be aware that Minute Papers can be a mixed blessing. Because they are not anonymous, I tend to get few completely negative comments; however, it often happens that after delivering what I consider to be an absolutely clear lecture, I get feedback that requires me to re-teach. For example, after a lecture on how the auditory system encodes frequency, I received the comment, "The lecture was very clear and I understood everything except how the auditory system encodes frequency. Could you go over that again?"

The time required to read the Minute Papers is not great. Because they are all typed and appear on my computer screen, I can read 70 responses in about 15 or 20 minutes. The students' chief complaints about the lecture responses are (1) that they cannot find an available computer cluster at the time they want to respond and (2) that they have no questions about the lecture. This first complaint decreases over the semester as students figure out which clusters are free at what times. The second complaint I can address by offering several alternative ways to respond. Although I do not know whether students benefit directly from Minute Papers, I do know that I understand their knowledge of the subject better, and I believe that it helps me improve my lectures and the course accordingly.

For more detail on these and other Classroom Assessment Techniques, phone the TRC at 855-2635 or email teaching@indiana.edu.

"Exam Questions" continued

The student would then stand up and read the question and answer to the class. I would add any missing information, and we would usually spend a minute or two discussing the question and answer. I would then call on a second student to present another question and answer. The whole process took about 5 to 7 minutes.

Students had to present integrative, high-level questions. Students had to prepare 2 questions so they could not say, "I had the same question." If they were not in class when their name was called, they forfeited that opportunity to earn the bonus percent.

How did this affect the students' behavior?

It seemed to me that students attended more classes, probably because they could potentially earn bonus points and obtain questions that might appear on an exam. The students' responses on the course evaluation indicated that they were pleased with the course (it received a rating of 3.3). They said that the course was hard work, but in a non-punitive way. Almost all comments about presenting questions and answers were positive.

From my perspective, this simple procedure helped students stay on task and provided them with a more obvious degree of control than the typical "review your notes, study hard, and you'll get a good grade" approach. In essence, that is what they were doing; but, asking them to prepare questions and answers provided the means and incentive for doing so that many students lack.

This Classroom Assessment Technique (CAT) did more than make my students review; they served as an indicator for my teaching. If the student questions were dismal, I took it as a sign that they were not understanding the material. When their questions were at a higher level, then I assumed they understood the course topics at a higher level. They soon learned it was to their advantage to write higher level questions since those tended to be the ones I would put on the test. The technique benefited student learning and gave me feedback that was useful as well.

What's what?

In conversations about the evaluation of teaching, one often hears several terms bandied about, describing different types of assessment. We thought it would be useful to clarify these terms and the purposes of these different techniques.

Formative Evaluation

is aimed at personal teaching improvement; it is designed to provide you with information you can use. Our "Student Evaluation of Teaching" and the consultation reporting the results is a formative evaluation.

IS NOT

Summative Evaluation

is an after the fact assessment. End of semester evaluations like BEST's MultiOp or departmental surveys which are used primarily for performance review are summative.

IS NOT

Classroom Assessment Techniques

which we described in our last newsletter, are informal ways to get immediate feedback in order to make midcourse corrections.

What Constitutes Good Thinking?

A good thinker can be characterized in terms of knowledge, abilities, attitudes & habitual ways of behaving. **A Critical Thinker:**

- √ uses evidence skillfully & impartially
- √ organizes thoughts & articulates them concisely & coherently
- √ distinguishes between logically valid & invalid inferences
- √ suspends judgement in the absence of sufficient evidence
- √ attempts to anticipate the probable consequences of alternative actions before choosing among them
- √ sees similarities & analogies that are not superficially apparent
- √ can learn independently & at least equally importantly, has an abiding interest in doing so
- √ applies problem-solving techniques appropriately in domains other than those in which they were learned
- √ listens carefully to other people's ideas
- √ understands the difference between winning an argument & being right
- √ can strip a verbal argument of irrelevancies & phrase it in terms of essentials
- √ understands the difference among conclusions, assumptions & hypotheses
- √ is sensitive to the difference between the validity of a belief & the intensity with which it is held
- √ can represent differing viewpoints without distortion, exaggeration, or caricaturization
- √ recognizes the fallibility of one's own opinions, the probability of bias in those opinions, & the danger of differentially weighing evidence according to personal preferences

Adapted from: Teaching Thinking Skills (p. 29-30). 1987. J. Baron & R. Sternberg, Editors.

ATTACHMENT VIII

CRITICAL THINKING

Critical thinking is a kind of thinking in which humans make reasoned judgments about phenomena within their field of concern. The focus of critical thinking is getting one's intellectual money's worth. One thinks critically to avoid being duped, to understand ramifications of observations, and to gather full meaning from something seen or heard.

Critical thinking is, in reality, a constellation of thinking skills. Critical thinkers are people who:

1. recognize purpose in messages,
2. distinguish relevant from irrelevant information,
3. evaluate sources,
4. note points of view,
5. recognize bias,
6. recognize slanted language,
7. recognize emotive language,
8. distinguish fact from opinion, and
9. recognize and evaluate inferences.

Because critical thinking consists of so many components, it may be wise to try to teach each of them rather than to try to teach critical thinking per se. This belief suggests that each of the components should be discussed separately.

Purpose

Every message has two facets: content and intent. The content of a message can usually be discerned by persons who (literally) speak the same language. Consider the sentence "I'm leaving!" The content is clear - the speaker is about to remove him or herself from a present physical location. But imagine the difference in meaning of this phrase when the speaker is:

1. a child leaving for school,
2. a soldier off to war,
3. a spouse after a marital spat,
4. a holdup man backing out the door, or
5. a lover whose date is already 45 minutes late to a rendezvous.

The difference is a difference in intent.

The child is providing information, the soldier is clinging to last moments of peace, the spouse is challenging the mate to try to stop him or her, the holdup man is trying to con everyone into staying put, and the lover is self-justifying an action. All of these possibilities and infinitely more can emanate from a simple phrase such as "I'm leaving!"

Thinking Terminology
(Valerie Maholmes, June 1995)

Inductive Discovery: Process of developing or building an hypothesis, theory, or an idea—collecting data, connecting fragmented details, and identifying a binding principle.

Deductive Discovery: Process of testing an hypothesis, proposition, or idea by confirming, refuting, and modifying the hypothesis.

Analysis: Process of discerning, discriminating, and marking off the trivial from the important as well as the irrelevant from what points toward a conclusion.

Synthesis: Pulling together and combining ideas, interpreting selected facts, and including previously analyzed data.

Systematic Inference: Recognizing the relationships and interdependences between previously unorganized or disconnected considerations by discovering facts and analyzing data.

6 Aspects of Critical Thinking

- 1. Thinking Actively**
- 2. Carefully Exploring Situations with Questions**
- 3. Thinking for Ourselves**
- 4. Perceiving, Believing, Knowing**
- 5. Challenging Assumptions**
- 6. Discussing Ideas in an Organized Way**

*The goal of Critical Thinking is simple:
to give us understanding.*

Adaptations from: Thinking Critically. 1994. John Chaffee. Invitation to Critical Thinking. 1984. Vincent Barry. Asking the Right Questions. 1986. M. Neil Browne & Stuart Keeley.

Challenging Assumptions

A major block to critical thinking is a stereotyped way of looking at or describing something.

What are some of the assumptions we make which can serve as a barrier to critical thinking?

Assumptions are:

- hidden or unstated (in most cases)
- taken for granted
- influential in determining the conclusion
- necessary if the reasoning is to make sense
- potentially deceptive

*Remember the infamous saying:
"You know what happens when we ASSUME..."*

28 Hour Days (Bonk, 2003)

Personal Time Management Plan (can you find 4 more hours?)

Time Management Techniques	Time Saved Per Day

Keywords: Reduce, schedule, use, delegate, control, manage, plan, etc...

THINKING FOR OURSELVES

Exercise: Answer the following questions, based on what you believe to be true.

	Yes	No	Not Sure
Is the earth flat?	_____	_____	_____
Is democracy the best form of government	_____	_____	_____
Should daycare be offered for the children of employees?	_____	_____	_____
Are unions a beneficial advocate?	_____	_____	_____
Should primary and secondary education be year round?	_____	_____	_____

QUESTION:

Reason/Evidence

- **Authorities:**
- **References:**
- **Factual Evidence:**
- **Personal Experience:**

Focuses on 5 Key points:

1. Inference
2. Assumption
3. Deductive Reasoning
4. Drawing Conclusions/Interpretation
5. Evaluating Arguments

Sample item 1.

Should all young men in the United States go to college?

Strong
Argument

Weak
Argument

1. Yes, college provides an opportunity for them to learn school songs and cheers.
2. No; a large percent of young men do not have enough ability or interest to derive any benefit from college training.
3. No; excessive studying permanently warps an individual's personality.

Sample item 2.

A study of vocabulary growth in children from eight months to six years old shows that the size of spoken vocabulary increases from zero words at age eight months to 2562 words at age six years.

Follows

Conclusion
Does Not
Follow

1. None of the children in this study had learned to talk by the age of six months.
2. Vocabulary growth is slowest during the period when children are learning to walk.

EXPLORING SITUATIONS WITH QUESTIONS

A large public higher education institution is considering funding a critical and creating thinking center on campus. Other large public education institutions have considered this plan, some have implemented—some have not. The institution is also considering whether public funds or private funds should be used to support this center.

Exercise: Critically examine the case by posing questions from each of the six categories of questions.

1. Fact

2. Interpretation

3. Analysis

4. Synthesis

5. Evaluation

6. Application

Socratic Method

- **Select both positive and negative examples to illustrate point**
- **Vary cases to help focus on facts**
- **Employ counter examples**
- **Generate hypothetical cases to encourage reasoning (What if...)**
- **Use hypothetical identification strategies**
- **Use hypothetical evaluation strategies**
- **Promote identification of other predictions**
- **Employ entrapment strategies**
- **Foster tracing of consequences to a contradiction**
- **Encourage the questioning of answers provided by authorities**

Carefully Exploring Situations with Questions

An important dimension of thinking actively is carefully exploring the situations in which we are involved using relevant questions.

The Key: To explore carefully all the interacting elements of a situation in order to understand the overall situation, the alternatives, we have, & the decisions we make.

6 Categories of Questions:

Fact: determining the basic information (who, what, when, where, why, how)

Interpretation: discovering relationships between events or ideas

chronological: relating things in time sequence

process: relating aspects of growth, development or change

comparison: relating things in terms of similar features

contrast: relating things in terms of different features

causal: relating events in terms of the way some event(s) are responsible for other event(s)

Analysis: separating an entire process or situation into its component parts & understanding the relation of these parts to the whole

Synthesis: combining ideas to form a new whole or come to a conclusion, making inferences about future events, creating solutions, designing plans of action

Evaluation: making informed judgments & decisions by determining relative value, truth or reliability of things

Application: taking knowledge or concepts gained in one situation & applying them in other situations

The ability to ask appropriate & penetrating questions is one of the most powerful thinking tools we can possess.

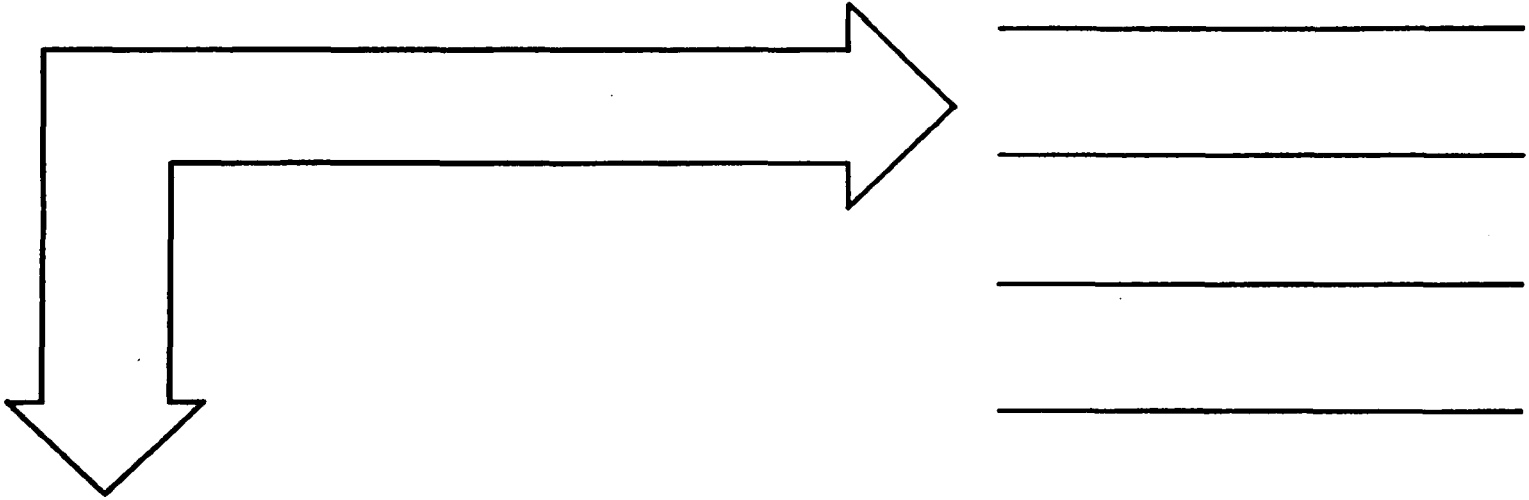
QUESTIONS

Thinking Skill: Hypothesizing

FAT?	SKINNY?
1.	1.
2.	2.
3.	3.
4.	4.

THINKING AT RIGHT ANGLES

Thinking Skill: Associating Ideas



Four horizontal lines for writing.

Bloom's Taxonomy

- KNOWLEDGE**
- Knowledge of specifics* (What is the principal ingredient in the air we breathe?)
 - Knowledge of ways and means of dealing with specifics* (What steps would you have to take to become a licensed operator? What is the correct form for presenting a motion before a meeting?)
 - Knowledge of universals and abstractions* (What is the basic principle behind the operation of a free market?)
- COMPREHENSION**
- Translation* (In your own words what does "laissez-faire economy" mean? What does it mean to say that to the victor belongs the spoils?)
 - Interpretation* (In what ways are the Democratic and Republican positions on support for the military budget similar?)
 - Extrapolation* (If the use of electrical energy continues to increase at the present rate, what will be the demand for electrical energy in A.D. 2000?)
- APPLICATION**
- (If you measure the pressure in your barometer at the foot of the mountain and then measure it again at the summit of the mountain, what difference in the reading would you expect? If of two sailing vessels leaving New York at the same time en route to London one took a route following the Gulf Stream and one kept consistently south of the Gulf Stream, which would you expect to reach London first, everything else being equal?)
- ANALYSIS**
- (Questions that ask pupils to break complex ideas down into their component elements in order to make them more understandable.)
 - Analysis of elements* (Which part of the argument we have just read is fact and which is opinion? What propaganda devices can you find in this automobile advertisement?)
 - Analysis of relationships* (Does the conclusion that Senator X made logically follow from the facts he presented?)
 - Analysis of organizational principles* (In this poem what devices has the author used to build up the characters of the principal antagonists?)
- SYNTHESIS**
- Production of unique communication* (Describe the procedure you used and the results you observed in the experiment.)
 - Production of a plan or a proposed set of operations* (How would you go about determining the composition of this unknown chemical?)
 - Derivation of a set of abstract relations* (You have heard the description of the situation. What might be the causes of this situation?)
- EVALUATION**
- Judgment in terms of internal evidence* (In what ways is the argument presented illogically?)
 - Judgment in terms of external criticism* (Does the theory that organically grown foods are more healthful than other foods conform to what we know of the chemical composition of these foods? Explain.)

Lozear (1992)

Seven ways of knowing;
Teaching with Multiple Intelligences
Palatino, DC:
Skylight Publishing.

FIGURE 12.1

MI Theory and Bloom's Taxonomy

Ecology Unit: Local environment—trees in your neighborhood

	Bloom's Six Levels of Educational Objectives					
	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Lingualistic Intelligence	memorize names of trees	explain how trees receive nutrients	given description of tree diseases, suggest cause of each disease	list parts of tree	explain how a tree functions in relation to the ecosystem	rate different methods of controlling tree growth
Logical-Mathematical Intelligence	remember number of points on specific trees' leaves	convert English to metric in calculating height of tree	given height of smaller tree, estimate height of larger tree	analyze materials found in sap residue	given weather, soil, and other information, chart projected growth of a tree	rate different kinds of tree nutrients based on data
Spatial Intelligence	remember basic configurations of specific trees	look at diagrams of trees and tell what stage of growth they are in	use geometric principles to determine height of tree	draw cellular structure of tree root	create a landscaping plan using trees as central feature	evaluate practicality of different landscaping plans
Bodily-Kinesthetic Intelligence	identify tree by the feel of the bark	given array of tree fruits, identify seeds	given type of local tree, find an ideal location for planting it	create different parts of tree from clay	gather all materials needed for planting a tree	evaluate the quality of different kinds of fruit
Musical Intelligence	remember songs that deal with trees	explain how old tree songs came into being	change the lyrics of an old tree song to reflect current issues	classify songs by issue and historical period	create your own tree song based on information in this unit	rate the songs from best to worst and give reasons for your choices
Interpersonal Intelligence	record responses to the question "What is your favorite tree?"	determine the most popular tree in class by interviewing others	use survey results to pick location for field trip to orchard	classify kids into groups according to favorite tree	arrange field trip to orchard by contacting necessary people	rank three methods to ask others about tree preference
Intrapersonal Intelligence	remember a time you climbed a tree	share the primary feeling you had while up in the tree	develop "tree-climbing rules" based upon your experience	divide up your experience into "beginning," "middle," and "end"	plan a tree-climbing expedition based on your past experience	explain what you liked "best" and "least" about your experience

MI
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Think Sheets:

Explain why...

Explain how...

What is the main idea of ...?

How would you use ... to ...?

What is a new example of ...?

What do you think would happen if ...?

What is the difference between ... and ...?

How are ... and ... similar?

What conclusions can you draw from ...?

How does ... affect...?

What are the strengths & weaknesses of ...?

What is the best ... and why?

How is ... related to...?

Generative and Evaluative Prompt Listing

Generative Prompts

FLUENCY (more ideas):

- alt q:** List all that you know about your topic in your head or on paper. You may want to jot down items in the list that are not in your paper.
- alt a:** Ask yourself: What other ideas does this suggest? What could I add here? And, how could I exaggerate or maybe say the opposite?
- alt z:** What else might your audience want to know? Would the reader want to know about the smell, sight, sound, or touch of your object?

FLEXIBILITY (types of ideas):

- alt w:** Add other categories, models, examples, or lists. You might try to use pictures in your head to compare points.
- alt s:** Just imagine if everything you've said so far is wrong. If the reader caught it, what changes might he/she suggest?
- alt x:** Think again about your reader. Are there other points of view that are necessary for your reader to understand.

ORIGINALITY (new ideas):

- alt e:** Try out a wild idea or describe your last thought in a metaphor. How is a ____ like a ____???
- alt d:** Ask yourself "What if...?" and then ask reflect on what might happen to change your mind on this topic.
- alt c:** Try combining two or more of your ideas into something really unique. Have you used your creativity or imagination?

ELABORATION (extenders):

- alt r:** Have some fun, play with the last idea, expand or extend it, and then maybe contrast it with something else.
- alt f:** Reread your last paragraph. Would expanding or adding a sentence help your reader understand?
- alt v:** Try to broaden the focus of your paper by including exceptions to what you are saying.

Evaluative Prompts

RELEVANCY (Quality):

- alt t:** Think about the problem or original topic. Is everything you've said needed or related to it?
- alt g:** Reread your paper and delete repeated or unneeded sentences which don't help form an overall theme.
- alt b:** Try to see or imagine where your writing is headed. Is the information you're providing good and also relevant?

LOGIC (clear/logical):

- alt y:** Give an example that might make your reasoning clearer to the reader. State all examples in clear and simple ways.
- alt h:** Read the first and last sentences to each paragraph. Are there transitions from one sentence to the next?
- alt n:** Think back about your original idea or opinion on this topic. What can you say now to provide support for your entire paper?

ASSUMPTIONS (assuming):

- alt u:** Reflect on the sources of your information. Are your sources and your assumptions stated as such in your paper?
- alt j:** Read over your paper for personal bias; look out for sentences where you say "I feel" or "I think" without backing them up.
- alt m:** Will your audience agree with your values, opinions, or ideas? If not, list something that might help get your point across.

CONCLUSIONS (conclusions):

- alt i:** Have you provided enough information to back up your claims and conclusions? And are there other effects to what you're saying?
- alt k:** Are there different conclusions to what you are saying? Try to explain these so they make sense for the reader.
- alt o:** Can you summarize to the reader what you have said in one or two sentences?

Nominal Group Technique for Problem Solving and Goal Setting

- 1. Statement of the problem. (5 minutes)**
- 2. Silent generation of Ideas by group members.
(10-15 minutes)**
- 3. Round-robin disclosure of ideas by group members;
piggy-backing of ideas encouraged. No discussion.
(30 minutes)**
- 4. Clarification of ideas; grouping of like ideas.
(10-15 minutes)**
- 5. Straw vote ranking of ideas to identify the group of
ideas to consider further. Secret ballot. Each
member chooses ten. (10 minutes)**
- 6. Further clarification of ideas and emerging concepts.
Can change wording. (10-15 minutes)**
- 7. Final priority ranking of ideas/concepts. Public vote.
Weighted ranking. (10-15 minutes)**

Best of the Best (A web Game)

Advice to the President-elect

by Sivasailam "Thiagi" Thiagarajan, PhD, CPT

RAMEs (Replayable Asynchronous Multiplayer Experiences) are web-based games that collect valuable ideas from virtual focus groups.

Need Your Help

You chose me to be the ISPI President-elect for 2004-2005. According to the job description, "the President-elect serves to provide continuity of programs, goals, objectives, and strategic direction in keeping with policy established by the Board of Directors." That sounds profound, but I have been conditioned to seek performance-based objectives. So, I asked a past president (who wishes to be anonymous) exactly what I should be doing during my President-elect year. She (or he) said, "For the next 12 months keep your mouth shut in Board meetings, fetch coffee for the other Directors, and undertake a variety of menial chores such as photocopying." This is performance-based all right, but not too inspiring. So, I am asking you for advice and help. Let's do that in a playful manner with a RAME activity called "Best of the Best."

Let's Play "Best of the Best"

This RAME has three rounds, and it will take about 5 to 15 minutes to complete each round.

- **Round 1.** Contribute a piece of advice for exemplary behavior as a President-elect.
- **Round 2.** Review a set of advice from other players and select the top two. (Other players will review your advice and compare it with other pieces of advice.)
- **Round 3.** Review the best pieces of advice selected by different groups and select the top two "best-of-the-best" advice.

Why You Should Participate

Here's what's in it for you:

- You will enjoy playing and scoring points.
- You will enjoy contributing a valuable idea.
- You will learn a process for effective and enjoyable data collection from online focus groups.
- When I become the ISPI President, I will appoint the winners as my unofficial Panel of Advisors.

Ready for the First Round?

Click [here](#) to visit the website and register yourself as a player. It will only take you 15 seconds (unless your name is a long one like Sivasailam Thiagarajan). The registration deadline is **Monday, May 10, 2003**. You will get simple instructions for participating in the first round after the registrations are completed.



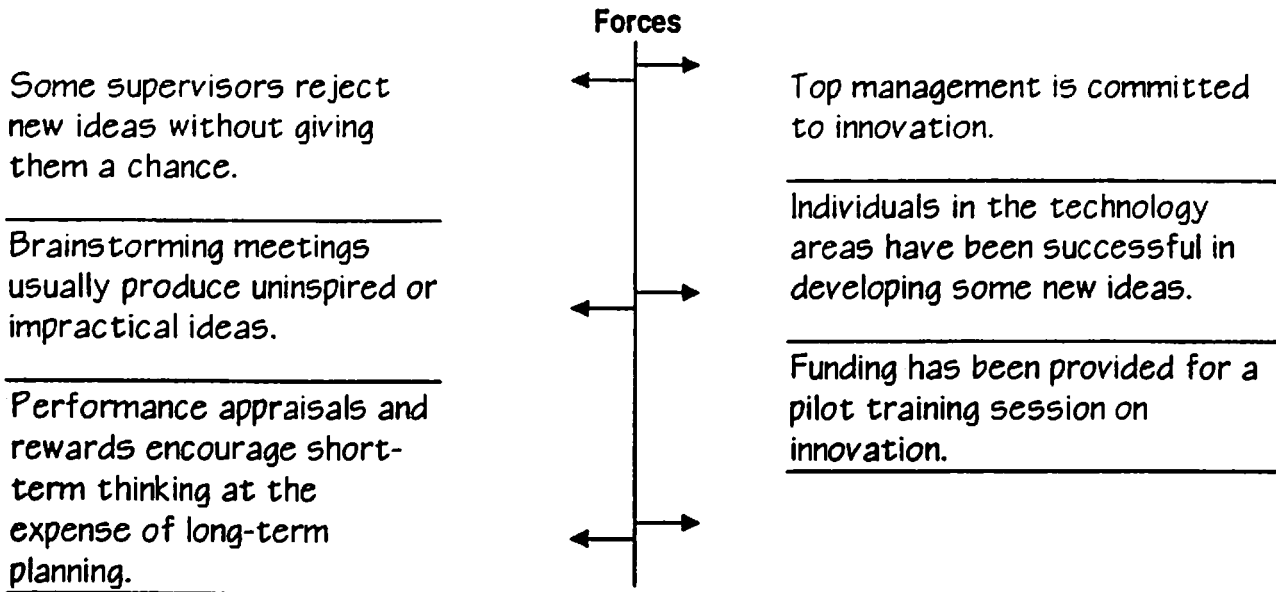
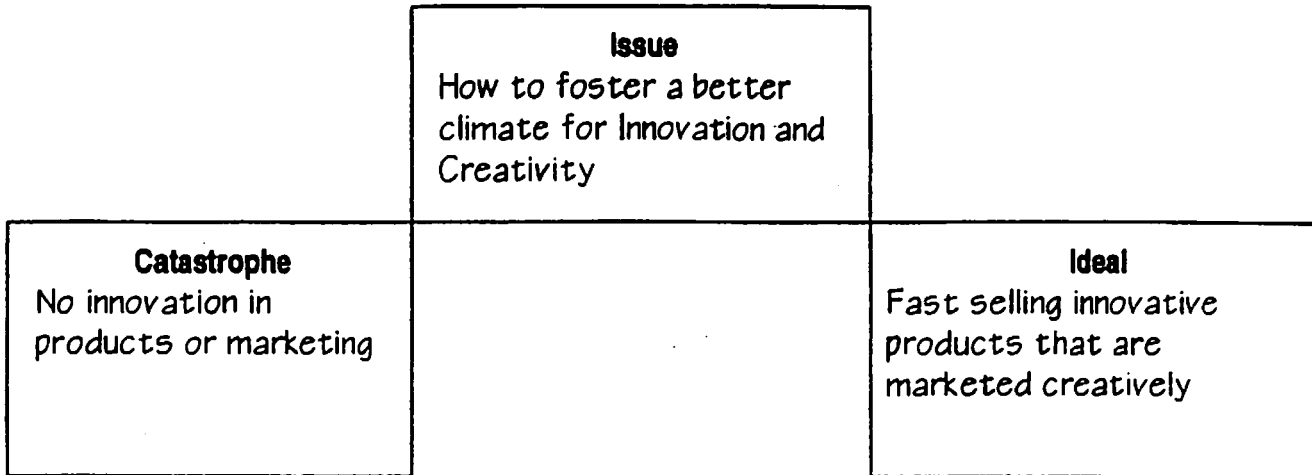
Force-Field Analysis: Techniques

Directions

1. Write a brief statement in neutral terms of the issue you are dealing with.
2. Briefly describe what a catastrophe would look like if the issue were not resolved, and what the ideal would look like if the issue were resolved.
3. List the present-day forces that keep you from resolving your issue, and list the present-day forces that might help you to resolve your issue.
4. Generate some specific ideas of things you could do to minimize the catastrophic forces and maximize the ideal forces.



Force-Field Analysis: Example





Force-Field Analysis: Application

Directions

1. For this application, you'll be working on your own workplace issue.
2. Work individually on steps 1-3 of the Force-Field Analysis technique. Use the worksheet on the following pages.
3. Form into your small group.
4. Work with your group at the flipchart.
 - List your forces.
 - Generate specific ideas.
5. Be prepared to share your ideas with the large group.



Force-Field Analysis: Ideas

<p>Force</p> <p>Specific Ideas</p>	<p>Force</p> <p>Specific Ideas</p>
<p>Force</p> <p>Specific Ideas</p>	<p>Force</p> <p>Specific Ideas</p>
<p>Force</p> <p>Specific Ideas</p>	<p>Force</p> <p>Specific Ideas</p>

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PROBLEM:

**FORCES OPERATING AGAINST THE SOLUTION
OF THE PROBLEM**

**FORCES WHICH ARE POTENTIAL ALLIES
IN SOLVING THE PROBLEMS**

1.		1.	
2.		2.	
3.		3.	
4.		4.	
5.		5.	
6.		6.	

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-108-

FORCE FIELD ANALYSIS

15. Force Field Analysis defines the forces that drive and restrain change within an organization. Driving forces move an organization forward toward its goals. Restraining forces act to impede or stall the organization as it attempts to implement change. By examining the driving and restraining forces in an organization it is possible to gain an understanding of the forces that must be reduced or increased for the project to be successful. The strength of the force is measured on a numerical scale of 0 to 5, with 5 = high and 0 = low and the results are show below in Figure 1.

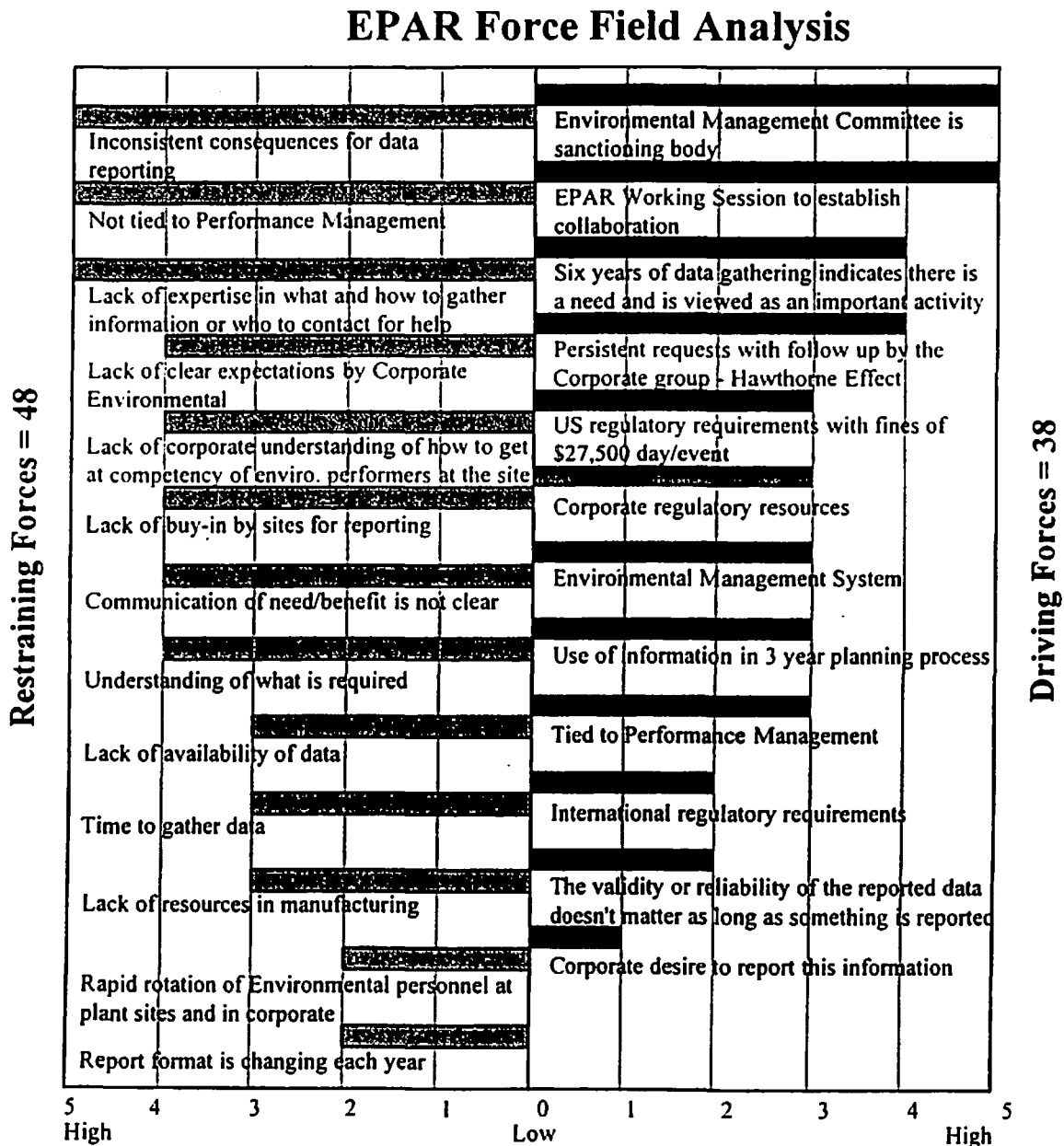


Figure 1. Force Field Analysis of the EPAR Training and Development Project

SWOT (approximate time required: 60 - 120 minutes; this step, however, can take considerably longer to research thoroughly)

<http://www.wmich.edu/nonprofit/Guide/guide7.htm>

"SWOT" (pronounced swat) stands for Strengths, Weaknesses, Opportunities, and Threats. This is a key part of strategic planning because it examines the organization itself and the external and future environment of the organization. **Strengths and weaknesses** refer to the organization itself—they are akin to assets and liabilities. They are current, that is, they exist now. **Opportunities and threats** exist outside the organization and/or they refer to the future.

Suggested Method. One way to get information about these quickly is to brainstorm. The leader should remind participants that brainstorming means not making judgments because those will come later. Participants should just speak what is on their minds, piggybacking on something someone else might have said earlier. There will be time later to screen out some of the duplicates, and even the "dumb" ideas.

If the group is small (about 10-12 people), this can be done by brainstorming on each item one at a time (strengths, weaknesses, then opportunities, and finally threats). Have the leader write the items on sheets of easel pad paper as they are brainstormed.

If the group is large (more than 12 people), divide the group into four smaller groups. Give each small group a sheet of easel pad paper, and assign each group a name (e.g., group #1, group #2).

Assign a SWOT item (e.g., group #1 works on strengths, and so on) to each small group. Have the members of the group brainstorm on their item for about 15 minutes. Then have the leader announce to the groups that they should rotate to another item. So group #1 would brainstorm about weaknesses, group #2 would brainstorm about opportunities, and so on. Have each group spend another five minutes on that item and add or alter what is already on the previous group's easel pad paper. Have them spend five minutes working on the easel pad paper. Then have them rotate again, and yet again until all participants have reviewed all four SWOT items.

After the SWOT items have all been listed, have the group as a whole discuss them, add more information, and clarify them. Have someone take careful notes at this point to ensure careful records of the information that comes out of this part of the process.

Finally, give 12 dots to each person, three each for strengths, weaknesses, opportunities, and threats. Have the individuals use the dots to vote on the three most important or most serious S, W, O, or T. Following the voting, have the group further discuss the results. It is likely as well that additional information will be needed, including some research to fully understand the specifics of some of the strengths, weaknesses, opportunities, or threats. Have one or more people assigned to conduct this research outside the organization's meetings and bring the results back to the group for further discussion. This research might include asking stakeholders in the organization about their opinions.

Newsletter #22 - May 2001

SWAT SWOT!

Introduction

Last year, I began teaching SWOT Analysis (Strengths, Weaknesses, Opportunities, and Threats) following a more rigorous method. This method was developed by Terrence Metz of Morgan*Madison and Company, Inc. I'll call it "SWAT SWOT" (Special Workshop Analysis Technique for Strengths, Weaknesses, Opportunities, and Threats).

SWOT

SWOT is a method for describing a current situation. It is typically used in strategic planning, but it also is used in product development, annual planning of projects, or current situation analysis. I have used it in strategic planning, product development, and annual planning.

The SWOT analysis begins by listing each of the four areas:

- Strengths (what a group does well)
- Weaknesses (what a group does not do well)
- Opportunities (situations, events, etc., outside of the group that provide unique opportunities for growth, change, etc.)
- Threats (changes or competitors who may adversely impact the group).

Brainstorm each list separately. Analyze each list to reduce to about 12 or fewer items each. Do this by discussing the items and asking the group to identify the key ones in each area. Number the list when finished.

Build a matrix (see below). Opportunities and Threats on top with Strengths and Weaknesses down the side. Explain the scoring process to the group. Each member gets "9" points (it is an arbitrary number and you may change it if you want more or fewer points). They assign the points based on the impact or leverage that each strength or weakness has relative to each opportunity or threat. The higher the impact, the higher the number. Ensure that they don't just spread them evenly - it should be based on a business understanding. Collect the scoring. Using a spreadsheet, calculate the final scores for each intersection, each column, each row, and each quadrant.

Review the scores with the group and highlight the quadrants and intersections with the highest scores. Summarize from the list and have the group identify which actions they should take.

Example:

A new software company looks at its **strengths** as: experience, good people, creative ideas, and product

integration. Its **weaknesses** are newness to market and time to market. **Opportunities** are integrated products, new market, and growing use of computers. **Threats** are Microsoft, other large companies, and hardware manufactures. The group would build the matrix and one person may score it as follows (scored from 1 to 9 with 9 indicating greatest impact):

		Opportunities			Threats			Total
		Product	Market	Computers	Microsoft	Large Cos.	Computer Makers	
Strengths	Experience	2						2
	People			3		3		6
	Ideas	2	2	3	2		4	13
	Integration	3	2	3		3	5	16
Weakness	Newness				3			3
	Time to Market	2	5		4	3		14
Total		9	9	9	9	9	9	54

Analysis:

The scoring indicates the most important strengths are their product ideas and integration. The weakness making them most vulnerable is their time to market. The most favorable opportunities are integrated products and growth of computer use.

Thoughts

Strengths matter if they help take advantage of an opportunity or fend off a threat. Weaknesses matter if they prevent a group from taking an opportunity or making them vulnerable to threats. Opportunities require some strength to take advantage. This matrix helps to highlight which strengths, weaknesses, opportunities and threats require strategies.

This SWOT analysis helps focus future efforts - products, projects, or strategies. It takes 2 to 3 hours to complete, but it is worth the effort.

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COMPUTERWORLD

No. 100
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Quicklink

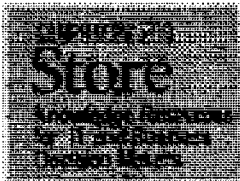


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SWOT Analysis

By Stacy Collett
JULY 19, 1999

Content Type: Quickstudy
Source:

Knowledge Centers

- Careers
- CRM
- Data Management
- Development
- E-business
- ERP/Supply Chain
- Hardware
- IT Management
- Mobile & Wireless
- Networking
- Operating Systems
- ROI
- Security
- Storage
- Web Site Mgmt
- xSP
- More topics...

Departments

- QuickStudies
- SharkTank
- FutureWatch
- Careers
- Opinions/Letters
- More departments...

Services

- Forums
- Research
- QuickPolls
- WhitePapers
- Buyer's Guide
- More services...

Definition

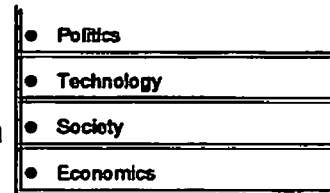
SWOT stands for Strengths, Weaknesses, Opportunities and Threats. It's a four-part approach to analyzing a company's overall strategy or the strategy of its business units. All four aspects must be considered to implement a long-range plan of action.

In order to swat the competition you need to understand SWOT. SWOT stands for Strengths, Weaknesses, Opportunities and Threats. It's a way to analyze a company's or a department's position in the market in relation to its competitors. The goal is to identify all the major factors affecting competitiveness before crafting a business strategy.

"It comes from an old term from the strategic planning field," says Fred Wiersema, co-author of *The Discipline of Market Leaders*. Marketing gurus have taken familiar terms from old "situation analysis" principles – like core competencies (your company's main business), liabilities (weak points that need improvement), customers and competitors – and simply given them a catchy new acronym, according to Wiersema.

SWOT Breakdown
SWOT identifies the internal and external factors that affect an organization. Here's the breakdown of SWOT by internal and external variables:
Internal factors (Strengths and weaknesses)
● A corporate structure, culture and resources
● Shareholders
● Customers
● Competitors
External factors (Opportunities threats)

"The purpose of strategy is to be really clear before you take the direction. The point of a SWOT analysis is to have the best shot at a grounded plan," says Rashi Glazer, co-director of the Center for Marketing and Technology at the University of California at Berkeley.



For example, an information technology department needs to determine the strengths and weaknesses of its people and its technology. It also needs to make sure the IT strategy complements the company's business goals. The department head needs to ask: What is each staff member good at? What are they not good at?

Project leaders also must consider opportunities and threats – or customers and competitors. How attractive is the market or direction they're considering? What's their market share and cost structure?

Delta Air Lines Inc., for example, chose to invest in a multibillion-dollar customer service system that addresses the flight delay problems experienced by 20% of its passengers. Although some companies might think the move was excessive considering 80% of customers have no problems, Delta believed customer service was an important area for increasing market share and that competitors could pose a threat if Delta didn't address the problem.

Another example is Dell Computer Corp., which is a great example of how an IT company can use a SWOT analysis to carve out a strong business strategy, according to Glazer.

Dell recognized that its strength was selling directly to consumers and keeping its costs lower than those of other hardware vendors.

As for weaknesses, the company acknowledged that it lacked solid dealer relationships.

Identifying opportunities was an easier task. Dell looked at the marketplace and saw that customers increasingly valued convenience and one-stop shopping and that they knew what they wanted to purchase. Dell also saw the Internet as a powerful marketing tool.

On the threats side, Dell realized that competitors like IBM

and Compaq Computer Corp. had stronger brand names, which put Dell in a weaker position with dealers.

Dell put together a business strategy that included mass customization and just-in-time manufacturing (letting customers design their own computers and custom-building systems). Dell also stuck with its direct sales plan and offered sales on the Internet.

"Clarity in strategy works. Fuzzy strategies fail. Most strategies fail because they don't have a clear direction," Glazer says.

Analyze This





To help you do a SWOT analysis, use these sample questions as a guideline

STRENGTHS: Define areas you excel in, such as the company's core competency and resource analysis
• What does your company do well?
• How strong is your company in the market?
• Does your company have a clear strategic direction?
• Does your company's culture produce a positive work environment?
WEAKNESSES: Evaluate your liabilities
• What could be improved at your company?
• What does your company do poorly?
• What should be avoided?
• Is your company unable to finance needed technology?
• Do you have poor debt or cash flow?
OPPORTUNITIES: Analyze your customers and market attractiveness
• What favorable circumstances are you facing?
• What are the interesting trends? Is your company positioned to take on those trends?
• Is your company entering new markets?
• Is your company advanced in technology?
THREATS: Check out what your competitors are doing and assess other potential challenges

- What obstacles do you face?
- What is your competition doing?
- Are the required specifications for your products or services changing?
- Is changing technology threatening your position?
- What policies are local and federal lawmakers backing? Do they affect your industry?

Source: Computerworld

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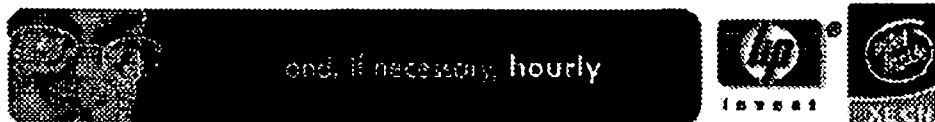
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Table 3. Partnership Blueprint (adapted from Duin & Baer, 2001)

Step	Questions to address	Your Issues or Considerations
Vision	What is the greater vision or greater social good?	
Description	What is it (i.e., the partnership)? How will it affect my institution?	
Beliefs	What are the guiding, foundational principles?	
Assumptions	What can my institution assume that we can achieve together from this partnership? What will each partner do or be responsible for?	
Operations	How will it work? Is it feasible? What are the goals?	
Commitment	Are multiple levels committed to it? Are levels of trust and covenants in place?	
Collaboration	Are collaboration and cooperation more important than hierarchy and competition? How do you know this?	
Risk	Can we tolerate the financial, legal, academic, and/or experimentation risks?	
Control	Who has control? Who has the authority? Where are clear lines drawn?	
Adaptation	Are we willing to alter the direction, structure, and operations to support the partnership? Can the partners adapt in order to accept and operate in a blended environment of values, purposes, missions, and outcomes?	
Return on Investment	What is the potential return on the partnership investment? <ul style="list-style-type: none"> • Learners • Faculty • Campus • State 	

Curt Bonk and Karen Vignare (2002). Wisconsin Distance Teaching and Learning Conference.


Goal Concretization

Count off from 1 to 25 and use the assigned statement below as the final sentence to a short story. You have 5-8 minutes to write your little vignette, story, moral, or fable. Afterwards, we will partner off in A, B, A, B, etc. fashion. Partner A will read his or her story first while Partner B listens and gives feedback as well as asks questions related to clarity, cohesion, logical transitions, conclusions, and relevancy. Next, roles are switched and Partner B will read his/her story and Partner A listens, provides feedback, and asks questions related to writing more, adding details, giving examples, and providing unique ideas.

Here are the 25 story endings:

1. And that's what it was like to be "sitting on top of the world."
2. And that's what means to have something "right under your nose."
3. It would have been possible, but "she left without a second glance."
4. Ah, and the young teacher replied, "better late than never."
5. And the frog said to the toad, "it's a small world after all."
6. And so ended their ride on "the elevator from hell."
7. Once again, they were reminded that "the whole is greater than the sum of the parts."
8. As the wiseman predicted, he emerged "head and shoulders above the rest."
9. For just this once, they knew that "money really is the root of all evil."
10. If he said it once, he said it a thousand times, "the check is in the mail."
11. And she turned to her brother and said, "you're only as old as you feel."
12. In retrospect, she knew what he meant now that "one size fits all."
13. It really was time to jump ship, since it was the "beginning of the end."
14. As her boss blew by, she smiled and said "the gag's on you;" should we "call it a day?"
15. And as he turned back to look, they were nowhere in sight; "the early bird did get the worm."
16. They rang a toast and promised it would last "till the end of time."
17. To which the little boy said to his mom, "better safe than sorry."
18. And despite great odds, he found his way back to her "or the story goes."
19. And the old wise man was right, one must "make hay when the sun shines."
20. And when the policeman gave them back their keys, they were like "two peas in a pod."
21. When the canceled check came back, they knew they were living "happily ever after."
22. But it was "six of one; half dozen of another."
23. She was right in saying "the odds are against you," but he never turned back.
24. It was, after all, "love at first sight."
25. Fortunately, grandma was willing to "forgive and forget" all that occurred.

Edward de Bono's Methods:

1. **K-W-L** (What do you know?, What do you want to know?, What did you learn?)
2. **PMI: Plus, Minus, Interesting** (pp. 110-113)
 - a. Do a P-M-I on this course so far (pp. 109)
 - b. Should marriage be a renewable 5 year contract?
 - c. Should all cars be painted yellow?
3. **APC: Alternatives, Possibilities, & Choices** (pp. 114-115) (This is creative!)
 - a. Rush hour traffic problems in large cities.
 - b. Packaging of chocolate bars.
 - c. Competitor cuts the price of toilet paper.
 - d. A young man is seen pouring beer in his car's gas tank. What could have happened?
4. **FIP: First Important Priorities** (pp. 116-117)
 - a. What should the priorities be in running a school?
 - b. If you were organizing a party, what would your priorities be?
 - c. How should a career be chosen?
5. **AGO: Aims, Goals, Objectives** (pp. 118-119) 
 - a. What are your objectives when you turn on the TV?
 - b. What are your objectives in taking this course?
 - c. If you were a spacecraft commander approaching Earth, what would be your objectives?
6. **OPV: Other People's Views** (pp. 120 or 121--same thing)
 - a. In a teacher strike, how many points of view are involved?
 - b. Tasks we choose in P506--what points of view are involved?
 - c. Success of your workshops will come from what points of view?
7. **C&S: Consequence and Sequel (of an action or decision)** (pp. 122-123)
(immediate, short term (1-5 yrs), medium term (5-20 yrs), and long term (over 20 yrs))
 - a. A boy is on vacation and his best friend steals his girlfriend.
 - b. The invention of a harmless happiness pill.
 - c. All office work can be done at home via a computer.
8. **CAF: Considering All Factors**
 - a. Buying a second hand car.
 - b. Choosing a place to live
 - c. Choosing a spouse.
9. **FI - FO: Info In (Already accounted for) - Info Out (Unknown/still needed)**
 - a. Buying a house or borrowing money.
 - b. Choosing a place to go on a vacation.
 - c. Giving a party.
10. **EBS: Examining Both Sides of an Argument**
 - a. Nuclear Power Stations, WWW Censorship, National Healthcare
11. **ADI: Agree, Disagree, Irrelevant**

Name _____

<u>K</u> What we already know:	<u>W</u> What we want to find out:	<u>H</u> How we will find out:	<u>L</u> What we learned:

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"THE 59 MINUTE COURSE IN THINKING"

PMI

PMI: The Treatment of Ideas

- P = PLUS.** The good things about an idea - why you like it
M = MINUS. The bad things about an idea - why you don't like it
I = INTEREST. What you find interesting about an idea

Instead of just saying that you like an idea, or don't like it, you can use a PMI. When you use a PMI you give the good points first, then the bad points, and then the points which are neither good nor bad, but are interesting. You can use a PMI as a way of treating ideas, suggestions and proposals. You can ask someone else to do a PMI on an idea or you may be asked to do one yourself.

EXAMPLE

IDEA: All the seats should be taken out of buses

- P:** More people can get into each bus.
It would be easier to get in and out.
Buses would be cheaper to make and to repair.
- M:** Passengers would fall over if the bus stopped suddenly.
Old people and disabled people would not be able to use buses.
It would be difficult to carry shopping or babies.
- I:** Interesting idea that might lead to two types of bus, one with and one without seats.
Interesting idea that the same bus would do more work.
Interesting idea that comfort may not be so important in a bus.

PRACTICE

1. By law all cars should be painted bright yellow.
2. People should wear badges showing whether they are in a good mood or bad mood that day.
3. Instead of getting married for ever, people should marry for a 5 year period, with an option to renew.

PROCESS

Discussion:

When is a PMI most useful? Do you always look at the good and bad points of an idea?

Does a PMI waste time?

Is it easy to do a PMI?

PRINCIPLES

- A. The PMI is important because without it you may reject a valuable idea that seems bad at first sight.
- B. Without a PMI you are very unlikely to see the disadvantages of an idea that you like very much.
- C. The PMI can show that ideas are not just good or bad but can also be interesting if they lead on to other ideas.
- D. Without a PMI most judgements are based not on the value of the idea itself but on your emotions at that time.
- E. With a PMI you decide whether or not you like the idea after you have explored it instead of before.

PMI

Thinking Skill: Evaluating

<i>P+</i>	
<i>M-</i>	
<i>I?</i>	

PRINCIPLES

- A. The **PMI** is important because without it you may reject a valuable idea that seems bad at first sight.
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- E. With a **PMI** you decide whether or not you like the idea after you have explored it instead of before.

QUESTIONS

- 1. All cars should be banned from city centers so that people can walk about freely.
- 2. Every young person should adopt an old person to care for.
- ★ 3. People should be allowed to work 10 hours a day for 4 days and have the rest of the week free, instead of working 8 hours a day for 5 days.

ISBN 0 08-034446-1

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CoRT THINKING

CoRT
WORKSHEET

BREADTH

P
P
PPPPP
P
P
MMMM
I
I
I
!

EDWARD DE BONO

PMI: THE TREATMENT OF IDEAS

Instead of just saying that you like an idea, or don't like it, you can use a **PMI**. When you use a **PMI** you give the good points first, then the bad points, and then the points which are neither good nor bad, but are interesting. You can use a **PMI** as a way of treating ideas, suggestions and proposals. You can ask someone else to do a **PMI** on an idea or you may be asked to do one yourself.

Idea: All the seats should be taken out of buses.

P: More people can get into each bus.
It would be easier to get in and out.
Buses would be cheaper to make and to repair.

M: Passengers would fall over if the bus stopped suddenly.
Old people and disabled people would not be able to use buses.
It would be difficult to carry shopping bags or babies.

I: Interesting idea that might lead to two types of bus, one with and one without seats.
Interesting idea that the same bus would do more work.
Interesting idea that comfort may not be so important in a bus.

1. By law all cars should be painted bright yellow.
2. People should wear badges showing whether they are in a good mood or bad mood that day.
3. All students should spend 3 months every year earning money.
4. Every adult should spend one week a year in the police force.
5. There should be a special TV channel for young people only.
- ★ 6. In many countries there is a jury system in which ordinary people assess whether an accused person is guilty or not. Some other countries do not have juries but have three judges who do all the assessment themselves. Do a **PMI** on this three-judge system.
- ★ 7. Do a **PMI** on the system which allows a lawyer to sue on behalf of a client and then to take a percentage of the damages awarded by the courts. If the lawyer does win the case, then he charges no fee.

DISCUSSION

- When is a **PMI** most useful?
- Does one always look at the good and bad points of an idea?
- Does a **PMI** waste time?
- Is it easy to do a **PMI**?

APC: ALTERNATIVES

APC = Alternatives, Possibilities, Choices

When you have to make a decision or take action, you may at first think that you do not have all the choices at your disposal. But if you look for them, you may find that there are more alternatives than you thought. Similarly in looking at a situation there are always obvious explanations. But if you look for them, you may find that there are other possible explanations that you had not thought of.

A car is found in a ditch and the driver is dead. What could have happened?

APC: The driver had a heart attack or fainted.
The car had a puncture, blow-out or mechanical failure.
The driver was drunk.
The driver misjudged the curve of the road.
The driver was attacked by a wasp and lost concentration.
The driver fell asleep.
The driver was murdered and then placed in the crashed car.

- ★ 1. A man goes into a bar and asks for a drink of water. The woman behind the bar gives him a drink of water and then suddenly screams. What possible explanations are there?
2. You discover that your best friend is a thief. What alternatives do you have?

- ★ 3. The Post Office is losing a lot of money. If you were running it, what alternatives would you have?
4. The brightest girl in class starts making mistakes in her work on purpose. What possible explanations are there?
- ★ 5. Fewer people want to be scientists. What possible explanations are there for this and what possible action can be taken?
6. Do an APC on all the different ways in which you could listen to rock music.
7. You want to get to sleep but a neighbor is playing very loud music. Do an APC on your alternatives. 1. What can you do right at the time? 2. What can you do to prevent it happening again?

Discussion:

- What is the point of looking for more alternatives?
- How do you tell which is the most likely or best alternative?
- When do you stop looking for other possibilities?
- When is it most useful to find new choices?

- A. If you cannot think of any alternatives yourself, you should ask someone else.

continued

- B. You go on looking for alternatives until you find one that you really like.
- C. There is almost always an alternative, even if there does not appear to be one at first.
- D. You cannot know that the obvious explanation is best until you have looked at some others.
- E. To look for alternatives when you are not satisfied is easy but to look for them when you are satisfied requires a deliberate effort.

- ★ 1. A factory owner knows that if he pays the wages his workers demand and probably deserve he will lose money and will have to close the factory and then there will be unemployment in that area. What choices does he have?
- 2. A boy wants to get married but he has to stay at home to look after his aging father. What alternatives does he have?
- ★ 3. In dealing with pollution, what alternative courses of action are there?

ISBN 0 08-034446-1

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CORT 1
WORKCARDS

CORT THINKING

BREADTH

APC
aPC
ApC
aPc
APc
apC
apc

EDWARD DE BONO

ATTENTION-DIRECTING TOOL

APC

◆ Symbol

◆ Choose One:

- A young man is seen pouring cans of beer into the gas tank of his car (Explanation)
- Men are smoking less, while women are smoking more (Hypothesis)
- In New Zealand, restrictions & regulations make it difficult to pursue opportunities (Perception)
- Rush hour traffic problems in cities... (Problems)
- Packaging of chocolate bars...(Review)
- Competitor undercuts the price of toilet paper...(Decision)
- ◆ Possible future scenarios for the entertainment industry (Forecasting)
- ◆ If you invented a new children's game...(Course of Action)

FIP: PRIORITIES

FIP = First Important Priorities

Some things are more important than others. Some factors are more important than others. Some objectives are more important than others. Some consequences are more important than others. In thinking about a situation, after you have generated a number of ideas, you have to decide which ones are the more important ones so that you can do something about them. After doing a **FMI**, **CAF**, **AGO** or **C&S**, you can do an **FIP** to pick out the most important points: the ones you have you give priority and deal with first.

Someone wants to borrow some money from you. From the different factors, you pick out the following as being priorities:

Do you have the money?	Can you afford to lend it?
Do you trust the borrower?	When will the borrower pay it back?

1. In doing a **CAF** on choosing a career, you may come up with the following factors: the pay; the chances of improvement or promotion; the people you would be working with; the work environment; the distance you would have to travel to get to work; the interest or enjoyment of the work. If you had to pick out the three top priorities from these factors, which would you choose?

2. A father finds that his son has stolen a fishing rod from someone fishing in the canal. In dealing with the boy (aged 10) what should the father's priorities be?
3. Do an **AGO** on buying clothes and then do a **FIP** on the objectives you find.
4. In deciding whether you like someone or not, which factors do you think are the most important? Give the top three priorities.
5. If you were organizing a party, what would your priorities be?
- ★ 6. A nineteen-year-old boy wants to spend a year travelling around Africa. He asks his parents for some money. What should their priorities be in deciding whether to help him or not?
7. When people vote to elect a politician, what do you think their priorities should be? Do an **AGO** and list four priorities.

Discussion:

- Are priorities natural or should you make a special effort to choose them?
- Are the priorities always obvious?
- When is it most useful to find priorities?
- How do you choose priorities?

- A. It is important to get as many ideas as possible first and then to start picking out priorities.
- B. Different people may have different priorities in the same situation.
- C. You should know exactly why you have chosen something as a priority.
- D. If it is difficult to choose the most important things, then try looking at it from the other direction: drop out the least important and see what you are left with.
- E. The ideas not chosen as priorities must not be ignored. They too are considered – but after the priorities.

- 1. In running a school, what do you think the priorities should be?
- 2. What makes a TV program interesting. Do a CAF and then an FIP.
- ★ 3. If you were in charge of giving out money for research how would you choose to divide the money? What would your priorities be?

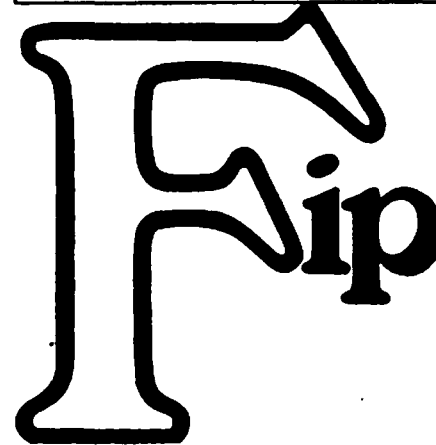
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CoRT THINKING

CoRT
WORKCARD 7

BREADTH



EDWARD DE BONO

AGO: OBJECTIVES

AGO = Aims, Goals, Objectives

You can do something out of habit, because everyone else is doing it, or as a reaction to a situation. These are all "because" reasons. But there are also times when you do something "in order to" achieve some purpose or objective. It can help your thinking if you know exactly what you are trying to achieve. It can also help you to understand other people's thinking if you can see their objectives. In certain situations the words "aims" and "goals" are more appropriate than objectives, but the meaning is the same.

A developer who is building a large new shopping center has the objective of making a profit for his corporation and for himself as a result. He also has the objective of putting up a shopping center that will be successful. He must have the objective of pleasing the potential shoppers. He must have the objective of fitting in with the planning authorities. In addition, he has the objective of working so well (on time and within budget) that he will be asked to develop more shopping centers in other places.

1. A father is very angry with his daughter, so he doubles her allowance. Why do you think he did this?
2. What would your objectives be if you won \$5,000.00 on a game show?

PRACTICE

- ★ 3. Everyone has to eat to live. But people have different objectives with regard to food. Do an AGO for the following people: homemaker, cook, store owner, food manufacturer, farmer, government.
4. Do an AGO for the police and put the objectives in order of priority.
5. You are the commander of a spacecraft approaching Earth from another planet. What different objectives might you have? Do three alternative AGOs.
- ★ 6. You are a dealer selling Ford motor cars. Another Ford dealer in a nearby town lowers his prices so that they are below yours. What are you going to do about it? What are your objectives?
7. What are your objectives when you turn on the TV?

Discussion:

- Is it always necessary to know your objectives exactly?
- When is it most useful to know the objectives?
- What happens if you do not have objectives?
- How important are other people's objectives?

OPV: OTHER PEOPLE'S VIEWS

OPV = Other People's Views

Many thinking situations involve other people. What these other people think is just as much part of the situation as the factors, the consequences, the objectives, etc. These other people may have a very different viewpoint. Although they are in the same situation, they may look at things very differently. It is a very important part of thinking to be able to tell how other people are thinking; trying to see things from another person's viewpoint is what doing an OPV is about. Another person may consider different factors (CAF), see different consequences (CAS), have different objectives (AGO) or priorities (FIP). In fact, all the thinking that you do for yourself, others may be doing for themselves – but differently.

EXAMPLE

A salesperson is trying to sell you a used sports car. The salesperson's point of view is to show how sharp it is, how powerful the engine, the new tires, how it suits you, what a good buy it is. Your point of view is to see whether it has been in a crash, how much spare tires cost, how worn the parts are, how much gas it uses, how it compares to other cars you have seen.

1. A father forbids his daughter of 13 to smoke. What is his point of view and what is hers?
2. An inventor discovers a new way of making cloth. This invention means that only one person out of every twenty would still be employed in making cloth. Do an OPV for the inventor, the factory owner, the workers, and the general public.

- ★ 3. A next-door neighbor opens her home as a refuge for sick people who have no one to care for them. Some neighbors object very strongly and some do not mind. What are the points of view of the refuge owner, the people using the refuge, those who object, and those who do not mind?
4. There is a train strike and people find it difficult to get to work. How many different points of view are involved in this situation?
5. A boy refuses to obey his teacher in class. The teacher reports the boy to the principal who suspends him. The boy's parents object. What are the viewpoints of the boy, the teacher, the principal, the parents, his classmates?
6. Do an OPV on someone who has just realized he is on the wrong airplane, going to the wrong city.
7. There is a minor traffic accident. The drivers start shouting at each other and eventually start fighting. Do an OPV for each driver.

Discussion:

- Is it easy to see other viewpoints?
- Whose point of view is right if two points of view differ?
- If other people cannot see your point of view, should you bother about theirs?
- Why is it necessary to see someone else's viewpoint?
- Should your action be based on your own viewpoint or someone else's as well?

C&S: CONSEQUENCES

C&S = Consequence and Sequel

The invention of the gasoline engine made possible automobiles, airplanes, the oil industry and a great deal of pollution. If all the consequences could have been foreseen at the time, electric or steam engines might have been used in cars. A new invention, a plan, a rule or a decision all have consequences that go on for a long time. In thinking about an action, the consequences should always be considered:

Immediate consequences

Short-term consequences (1-5 years)

Medium-term consequences (5-25 years)

Long-term consequences (over 25 years)

A man introduced rabbits to Australia to provide hunting for his friends. The immediate consequences were good because his friends had plenty to shoot at. The short-term consequences were also good because the rabbit provided an alternative source of meat. The medium-term consequences were bad because the rabbit multiplied so much that it became a pest. The long-term consequences were very bad because the rabbit spread all over Australia and did a great deal of damage to crops.

1. A new electronic robot is invented to replace all human labor in factories. The invention is announced. Do a **C&S** on this.

2. A new law is suggested to allow school children to leave school and start earning a living as soon as they want to after the age of 12. Do a **C&S** on this from the point of view of someone who leaves early, from the point of view of the schools, and from the point of view of society in general.
3. A new device makes it possible to tell whenever someone is telling a lie. Do an immediate **C&S** on this.
- ★ 4. While a boy is away on vacation his best friend goes off with his girl friend. What do you think would happen when the boy got back?
- ★ 5. There is a quiet residential district. Offices start opening in the area. Then there are more and more offices. What will change? Do an immediate and short-term **C&S** on this.
6. Some new medical evidence suggests that people who are slightly overweight are more healthy than people who are underweight. What consequences do you think this would have?
- ★ 7. The price of houses and even of condominiums rises to the point where young people cannot afford to buy them. What do you think will happen? Do a full **C&S**.

Discussion:

- Do long-term consequences matter?
- If it is not easy to see the consequences, should you bother with them?
- When is it most useful to look at them?
- Whose business is it to look at consequences?

ATTENTION-DIRECTORS

C & S

Immediate consequences up to 1 year:

Short term, from 1-5 years:

Medium term, from 5-20 years:

Long term, over 20 years:

◆ Symbol

◆ Choose One:

- a major breakthrough in solar energy
- the invention of a harmless happiness pill
- office work can be done at home via computer

THE COOPER THINKTANK

Graphic Organizers to Teach Thinking In the Cooperative Classroom

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Figure 14.2. Graphic Organizers

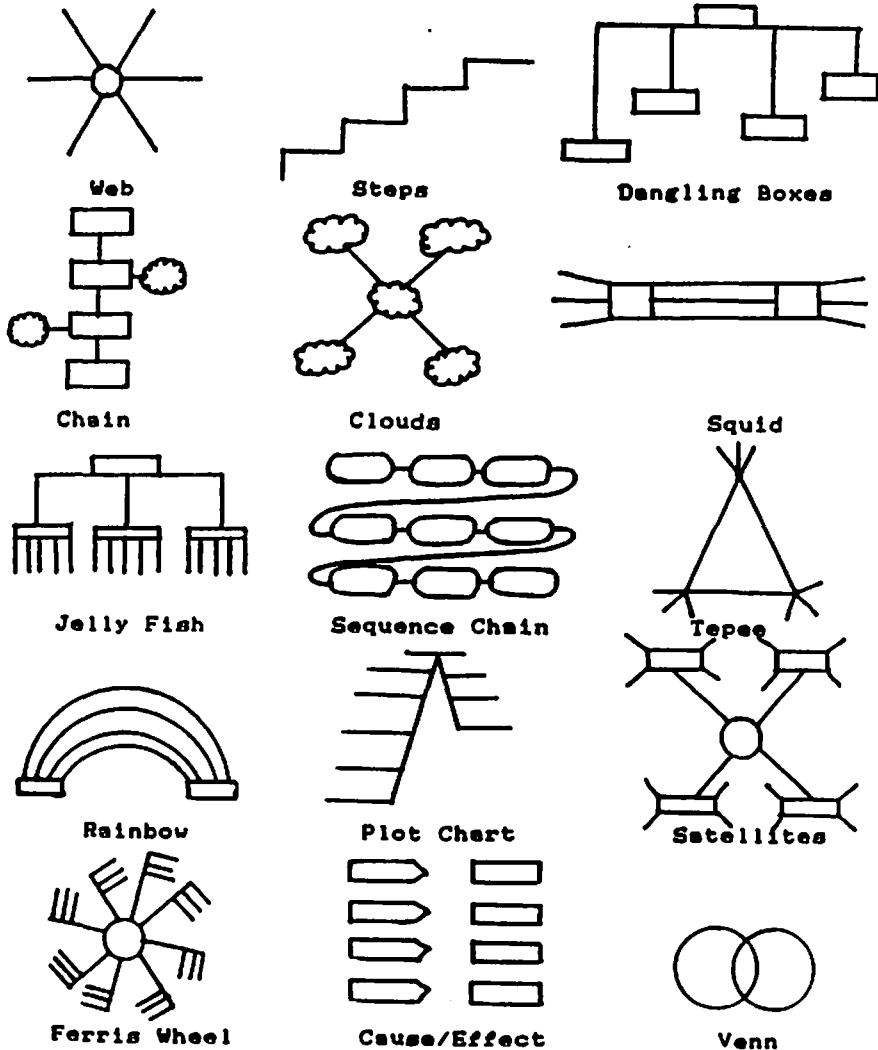


Figure 14.3. "No-Talent Kid" Editing Checklist

Carla Berkey (1992)

Author _____

Peer Editor _____

If the answer is "yes," place a check (✓) in the appropriate box. If the answer is "no," leave the block blank.

	self	peer	teacher
1. Does the writer use the correct FATP?			5
2. Does the opening paragraph capture the reader's interest and make a general statement about the theme of the narrative?			10
3. Does the body of the composition discuss the following topics in a clear and consistent manner and use <u>specific</u> details from the story? - A vivid sense of how the two characters spent their last time - An explanation of how the two characters found their group - A description of how the main character reacted to the situation which is consistent with his personality			60
4. Does the concluding paragraph review the main points of the narrative in an intriguing manner?			10
5. Did the author proofread for mechanics: spelling, capitalization, and punctuation?			10
6. Did the writer include all parts of the writing process: the prompt, the web, and all drafts?			5
			100

Figure 12.1. Web

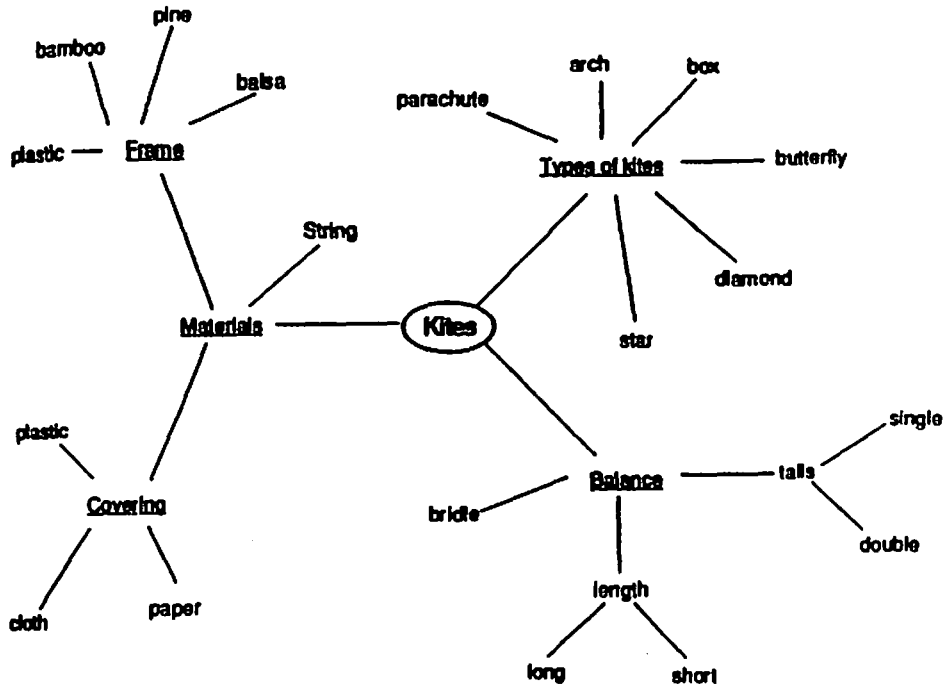


Figure 12.2. Sequence Chain for the Digestive Process

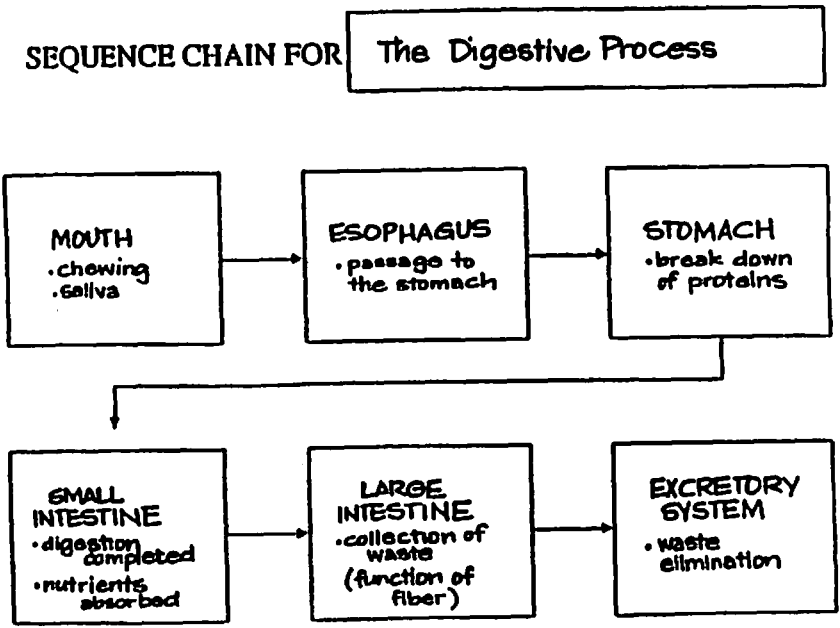
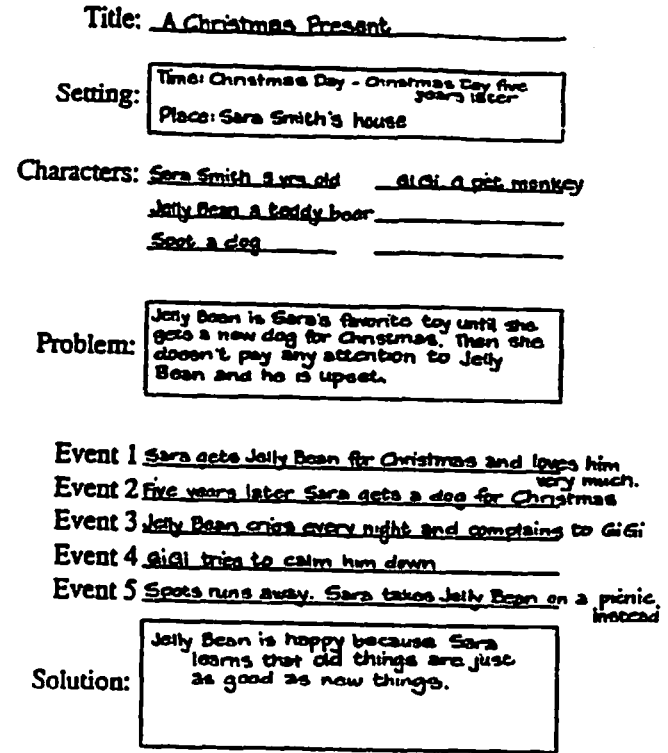


Figure 12.3. Story Map

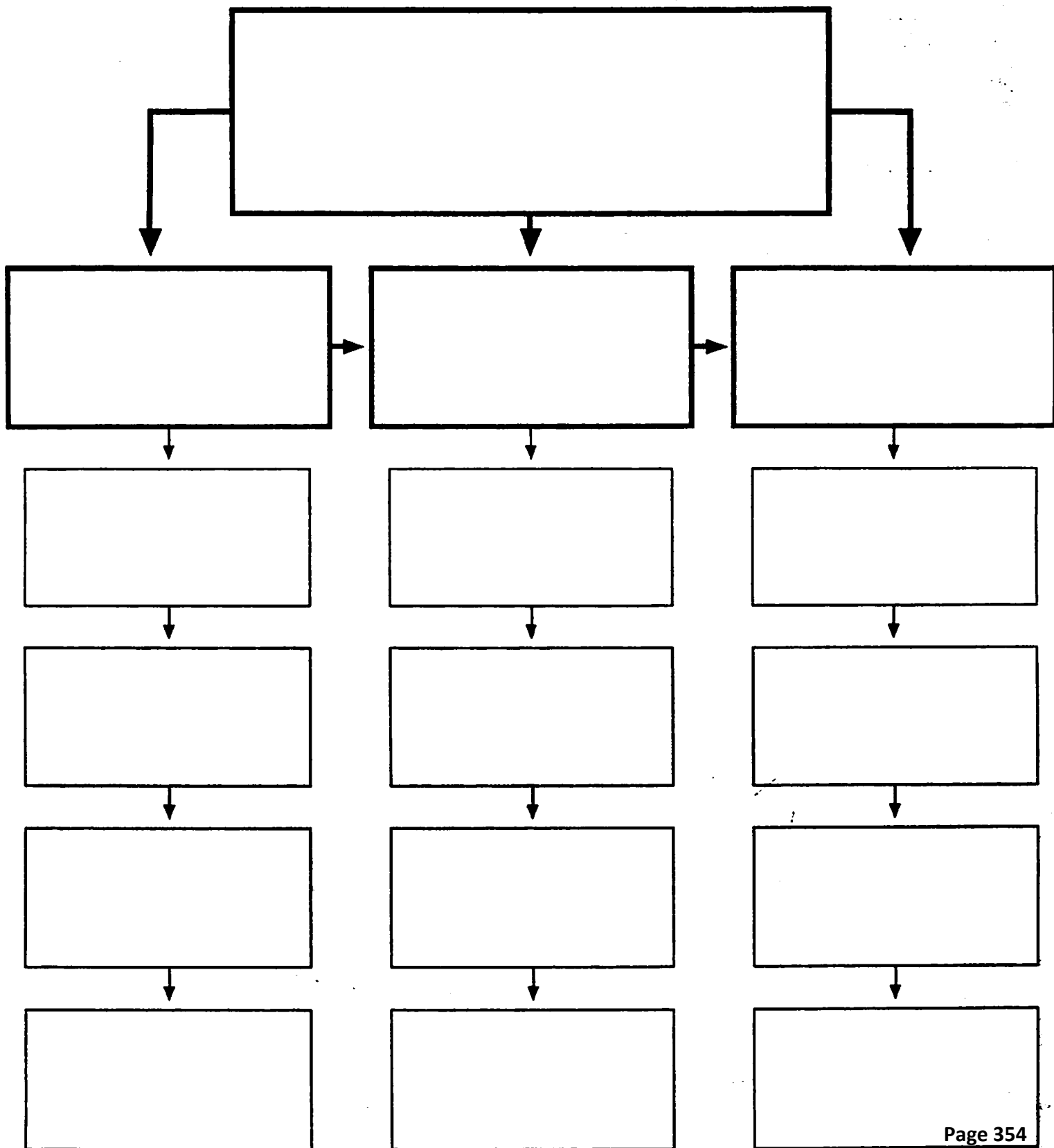


Jay McTighe (1992) - Enhancing Thinking Through Coop. Learning

Figure 12.4. Main Idea Table

main idea: The oceans and the waters of the world surround us.			
facts & details: Three-fourths of surface covered.	Ponds lakes rivers	Most in oceans which join other oceans (1 giant)	Water vapor, snow
source: pictures from outer space paragraph 1	p 32	Pacific Atlantic Indian others?	(check water cycle) Page 35

Name _____



NAME _____

CLASS _____

RANKING LADDER

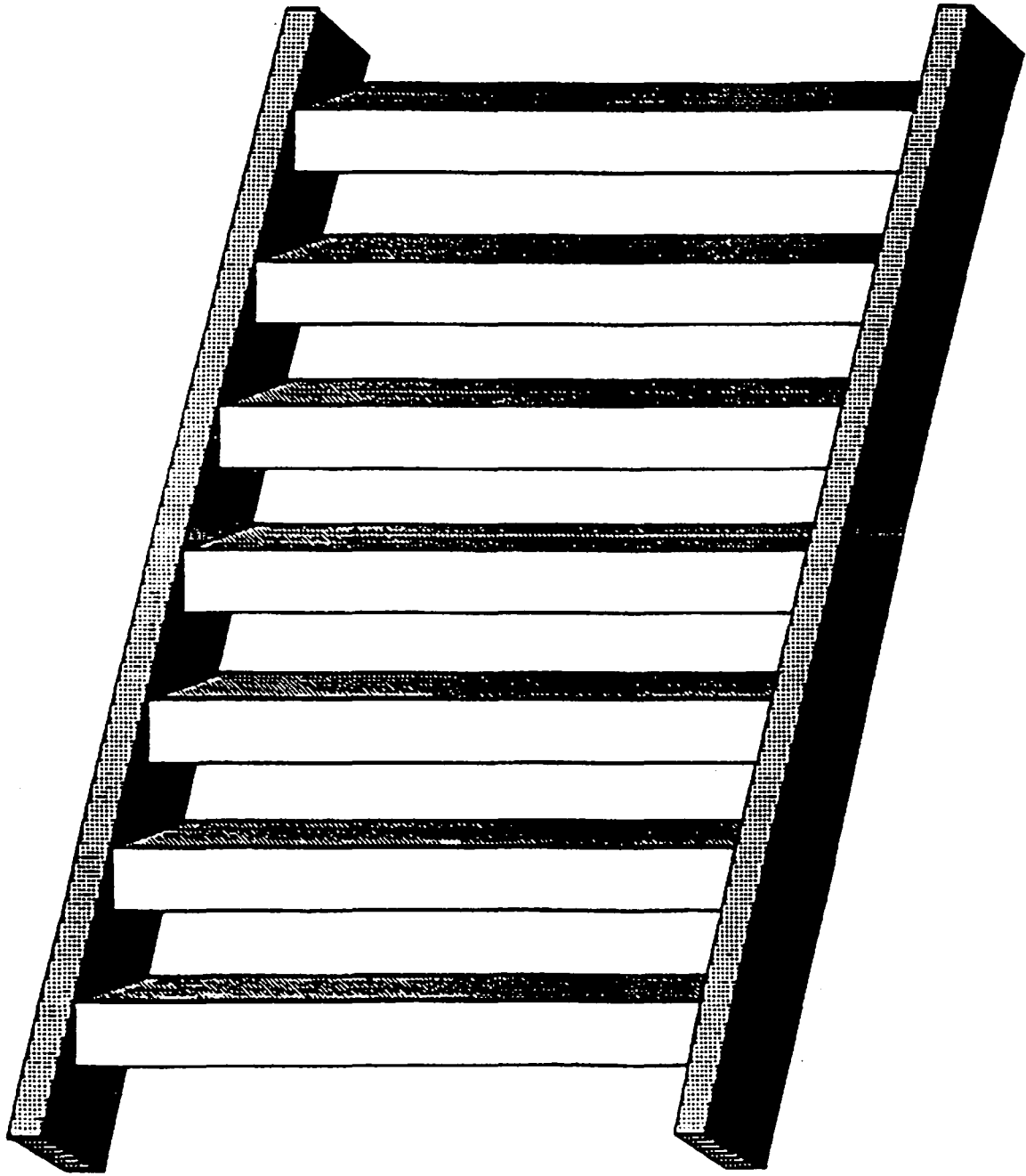


Figure 12.5. Character Map

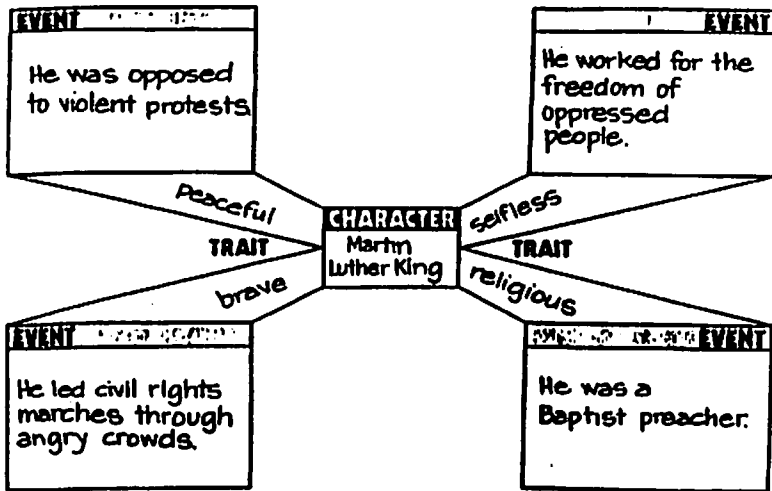
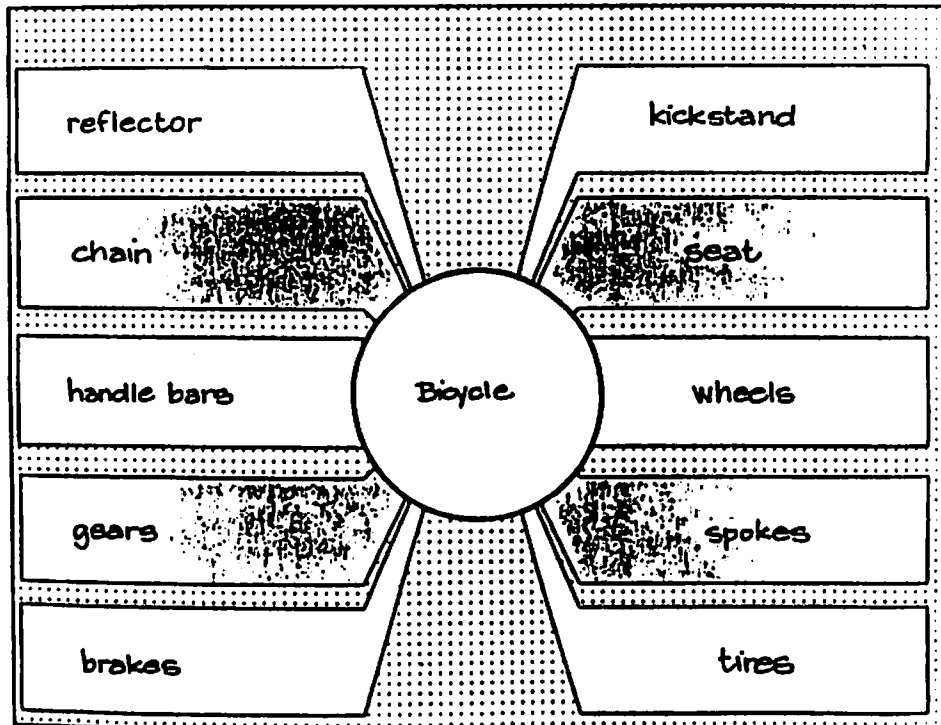


Figure 12.6. Attribute Wheel



character map provides a framework for developing original characters as part of creative writing.

- *Attribute Wheel.* The attribute wheel provides a visual representation of analytical thinking (see Figure 12.6). The focus of the analysis (object, concept, system, etc.) is placed at the center or hub of the wheel while the major characteristics or attributes are listed on the spokes.
- *Decision-Making Model.* This thinking frame encourages students to identify problems, state goals, consider alternatives, evaluate pros and cons, reach a decision, and provide a rationale for their choice(s) (see Figure 12.7).

Figure 12.7. Decision-Making Model

Problem The school cafeteria is noisy, crowded, and a generally unpleasant place to eat.	Goal(s) Make the lunch hour a more pleasant time for students.
Alternatives	Pros ⊕ & Cons ⊖
Allow students to leave the school building for lunch.	⊕ Would reduce the number of people in the cafeteria ⊖ Some students might return late to class
Play quiet music in the cafeteria during lunch hour.	⊕ Might calm people down. ⊖ Some students wouldn't like the choice of music.
Add an extra lunch period to the schedule.	⊕ Would reduce the number of people in cafeteria ⊖ Would require adjusting the school schedule
Prohibit talking in the cafeteria.	⊕ Would reduce noise ⊖ Can't eat in silence
Decision(s) Add an extra lunch period to the school schedule	Reason(s) An extra lunch period would reduce the number of people in the cafeteria at the same time. This would lead to shorter lines, reduce crowded tables, and help teachers control kids better.

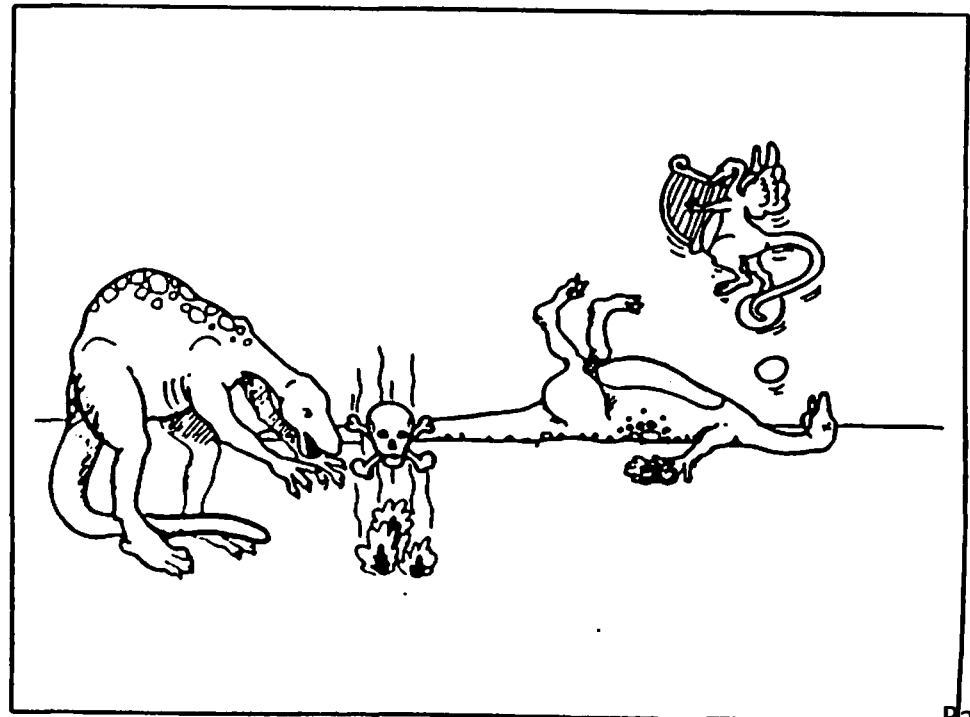
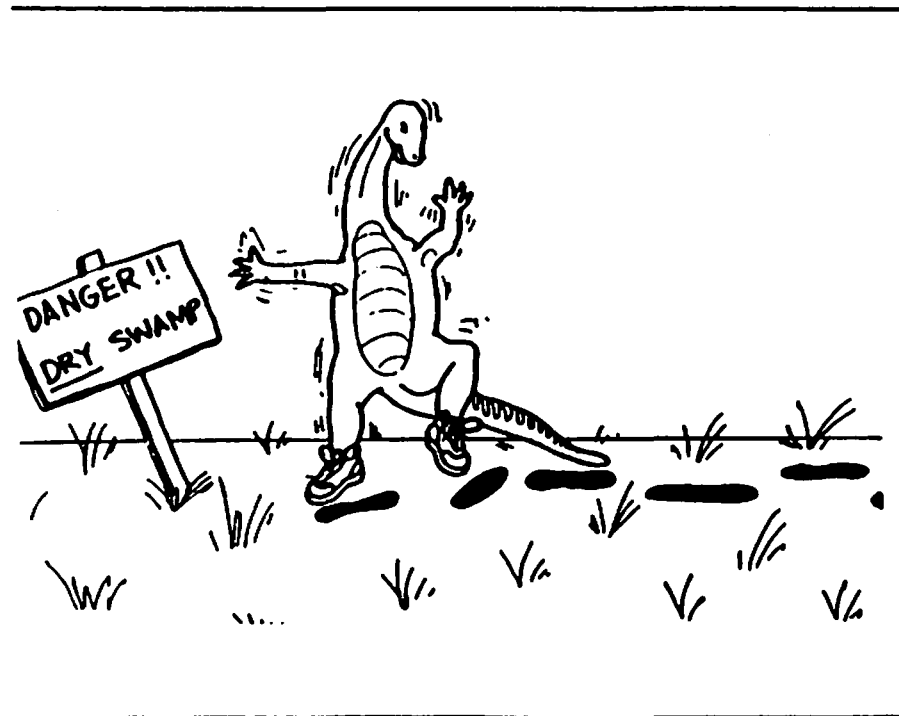
Jay McTighe (1992)

3	Tree	Exploding star.	Dinosaurs around a Christmas Tree watching the star on top explode.
4	Door	Small mammals ate eggs.	Small mammals breaking, destroying and eating dinosaur eggs on a door.
5	Hive	Disease	Sick dinosaur watching a hive.
6	Six	Too big and clumsy to survive.	Big, clumsy dinosaur tripping on sticks.
7	Heaven	Poisoned by newly emerging plants	Dinosaur eating poison, dying, and going to heaven.
8	Gate	Food sources disappeared.	Hungry-looking dinosaur looking at a gate on which a sign reads, "No food inside."
9	Vine	Killed each other off.	Dinosaurs fighting, while tangled in vines.

Mastropieri, Scruggs & Leuik
(1987)
American Educational Research Journal
24 (4) 505-519

Tolfa, Scruggs, and Mastropieri (1987) recently investigated the use of the pegword system to help students remember some possible causes of dinosaur extinction. For each of nine possible reasons, the list was developed as follows:

Number	Pegword	Reason	Interactive Picture
1	Bun	Climate became cold	Cold dinosaur holding frozen buns.
2	Shoe	Swamps dried up.	Dinosaur with shoes trying to enter dry swamp.



3.1 Possible Reason for Dinosaur Extinction #2 (shoe) = Swamps Dried Up

Figure 3.2 Possible Reason for Dinosaur Extinction #7 (heaven) = Plants Became Poisonous

Highlights from Research on Critical Thinking

- **Critical thinking is a complex of many considerations.** It requires individuals to assess their own and others' views, to seek alternatives, make inferences, and to have the disposition to think critically.
- **Critical thinking is an educational ideal.** It is not an educational option. Students have a moral right to be taught how to think critically.
- **Critical thinking ability is not widespread.** Most students do not score well on tests that measure ability to recognize assumptions, evaluate arguments, and appraise inferences. Adults, as well, frequently make simple judgmental errors on simple problems.
- **Critical thinking is sensitive to context.** Students' background knowledge and assumptions can strongly affect their ability to make correct inferences. Inferences are more likely to be correct when the context relates to the individual's personal experience and when performance is not associated with threats or promises.
- **Teachers should look for the reasoning behind students' conclusions.** Coming up with a correct answer may not be the result of critical thinking. Essay tests are more likely to reveal the student's thought processes than are objective tests. And the tests themselves must be evaluated critically to make sure they require critical thinking skills.
- **Simple errors may signal errors in thinking at a deeper level.** In trying to solve complex problems, for example, students may err not just by making a miscalculation, but by using an incorrect approach to the problem. They should be encouraged to take time before solving a problem to decide how to go about finding the solution.
- **Having a critical spirit is as important as thinking critically.** The critical spirit requires one to think critically about all aspects of life, to think critically about one's own thinking, and to act on the basis of what one has considered when using critical thinking skills.
- **To think critically, one must have knowledge.** Critical thinking cannot occur in a vacuum; it requires individuals to apply what they know about the subject matter as well as their common sense and experience.
- **We do not know a great deal about the effects of teaching critical thinking.** Critical thinking programs may teach students to be better thinkers, but more detailed knowledge is required before we will know specifically how students improve and how they remain deficient.

Critical Thinking: Recommended Reading

(The) Art of Thinking: A Guide to Critical & Creative Thought. 1984.
Vincent Ryan Ruggiero. New York, NY: Harper & Row Publishers.

Asking the Right Questions: A Guide to Critical Thinking. 1986.
M. Neil Browne & Stuart M. Keeley. Englewood Cliffs, NJ:
Prentice-Hall, Inc.

Big League Business Thinking. 1994. Paul C. Miller.
Englewood Cliffs, NJ: Prentice-Hall, Inc.

Critical Thinking: A Guide to Evaluating Information. 1983.
David Hitchcock. Toronto, Canada: Methuen.

**Critical Thinking: What Every Person Needs to Survive in a
Rapidly Changing World.** 1990. Richard Paul. Rohnert Park, CA:
Sonoma State University.

de Bono's Thinking Course. 1982. Edward de Bono. New York, NY:
Facts on File Publications.

**Developing Critical Thinkers: Challenging Adults to Explore
Alternative Ways of Thinking & Acting.** 1987. Stephen Brookfield.
San Francisco, CA: Jossey-Bass Publishers.

Improving Your Reasoning Skills. 1986 (2nd ed.). Alex Michalos.
Englewood Cliffs, NJ: Prentice-Hall Inc.

Invitation to Critical Thinking. 1984. Vincent Barry. New York, NY:
Holt, Rinehart & Winston.

Logic in Everyday Life: Practical Reasoning Skills. 1987.
Zachary Seech. Belmont, CA: Wadsworth Publishing Company.

Thinking Critically. 1994 (4th ed.). John Chaffee. Boston, MA:
Houghton Mifflin.

With Good Reason: An Introduction to Informal Fallacies.
1994 (5th ed.). S. Morris Engel. New York, NY: St. Martin's Press.

*The nature of the educational experience is to
question, examine, prod, poke, dissect & explicate.*

--G. Loacker

Figure 3.1. Gubbins' Matrix of Thinking Skills

I. Problem Solving

- A. Identifying general problem
- B. Clarifying problem
- C. Formulating hypothesis
- D. Formulating appropriate questions
- E. Generating related ideas
- F. Formulating alternative solutions
- G. Choosing best solution
- H. Applying the solution
- I. Monitoring acceptance of the solution
- J. Drawing conclusions

II. Decision Making

- A. Stating desired goal/condition
- B. Stating obstacles to goal/condition
- C. Identifying alternatives
- D. Examining alternatives
- E. Ranking alternatives
- F. Choosing best alternative
- G. Evaluating actions

III. Inferences

- A. Inductive thinking skills
 - 1. Determining cause and effect
 - 2. Analyzing open-ended problems
 - 3. Reasoning by analogy
 - 4. Making inferences
 - 5. Determining relevant information
 - 6. Recognizing relationships
 - 7. Solving insight problems
- B. Deductive thinking skills
 - 1. Using logic
 - 2. Spotting contradictory statements
 - 3. Analyzing syllogisms
 - 4. Solving spatial problems

IV. Divergent Thinking Skills

- A. Listing attributes of objects/situation
- B. Generating multiple ideas (fluency)
- C. Generating different ideas (flexibility)
- D. Generating unique ideas (originality)
- E. Generating detailed ideas (elaboration)
- F. Synthesizing information

V. Evaluative Thinking Skills

- A. Distinguishing between facts and opinions
- B. Judging credibility of a source
- C. Observing and judging observation reports
- D. Identifying central issues and problems
- E. Recognizing underlying assumptions
- F. Detecting bias, stereotypes, cliches
- G. Recognizing loaded language
- H. Evaluating hypotheses
- I. Classifying data
- J. Predicting consequences
- K. Demonstrating sequential synthesis of information
- L. Planning alternative strategies
- M. Recognizing inconsistencies in information
- N. Identifying stated and unstated reasons
- O. Comparing similarities and differences
- P. Evaluating arguments

VI. Philosophy and Reasoning

- A. Using dialogical/dialectical approaches

This matrix is based on a compilation and distillation of ideas from Bloom, Bransford, Bruner, Carpenter, Dewey, Ennis, Feuerstein, Jones, Kurfman, Kurfman and Solomon, Lipman, Orlandi, Parnes, Paul, Perkins, Renzulli, Sternberg, Suchman, Taba, Torrance, Upton, the Ross Test, the Whimby Analytical Skills Test, The Cornell Critical Thinking Test, the Cognitive Abilities Test, the Watson-Glaser Critical Thinking Appraisal, the New Jersey Test of Reasoning Skills, and the SEA Test.

TEACHING FOR THINKING MEANS

A Psychologically Safe Environment.

Students are encouraged to wonder, question, speculate, to take intellectual and creative risks. There is active listening, respect for ideas, withholding judgment, seeking for justification of positions.

Modelling.

The teacher models desired student intellectual/thoughtful behaviors.

Questioning.

Emphasis is on *higher-level questions* (analysis, synthesis, evaluation) and *divergent-productive questions* (quantity, analogy, reorganization, viewpoint).

Active Listening/Reflective Listening.

Asking follow-up/probe questions.

Drawing out a variety of viewpoints.

Summarizing.

Are you saying ...? What implications does (could) that have? Can you relate that to others' views? Would you summarize your position?

Wait Time.

Allow at least 3-5 seconds of thinking time after a question and after a response.

Developing a Variety of Thinking Repertoires.

Critical Thinking; Creative Thinking; Problem Solving; Decision Making.

Opportunities to Represent Ideas Differently.

Semantic; Figural/Numerical; Symbolic; Behavioral.

Metacognition. Thinking About Thinking.

Allowing students to examine/reflect upon their own thinking. How/Why did they arrive at a decision?

Occasions to Think-Pair-Share.

Allowing individual thinking time, discussion with a partner, class discussion.

Curriculum-Based Thinking Activities.

Teaching thinking skills directly.

Creating an interdependence between thinking skills and content.

Donna Rae Clasen
University of Wisconsin-Whitewater

QUESTIONING: *Knowledge is advanced more by asking the right question than having the right answer.* (A. Einstein)

LOWER-ORDER QUESTIONS (Bloom, 1956)

Knowledge: *Identification and recall of information*

Who, what, when, where, how?

Comprehension: *Understanding the meaning of content*

Explain _____ in your own words.

Define each of the basic terms involved in _____

Application: *Using facts, rules, principles, concepts*

How can _____ be used in solving this problem?

In the case of _____, what principle applies?

HIGHER-ORDER QUESTIONS (Bloom, 1956)

Analysis: *Studying the component parts of a whole*

What inferences can be drawn? What assumptions?

Distinguish between fact/fiction, relevant/irrelevant information, logical or illogical thinking.

Synthesis: *Combining component parts into a new whole*

What project/story/design can you create from this?

Evaluation: *Judging; forming opinions; making decisions*

Appraise the costs and benefits of the decision.

Discuss the implications of her actions for _____

Why do you think violence on television appeals to so many people?

DIVERGENT-PRODUCTIVE QUESTIONS (Gullford, 1956)

Quantity: *Producing many ideas*

What are all the ways _____?

Forced Association: *Metaphoric thinking. Looking for new insights by comparing unlike items*

How is history like a self-winding wristwatch?

The advertisement is like _____ because _____.

Reorganization: *Rearranging facts, parts, whole to see events/problems in a different way*

What if television were government controlled?

Suppose that by 2050 two-thirds of America is foreign-owned. What implications will this have?

Viewpoint: *Role playing to develop insight into others' views, positions*

Become the president of _____. Discuss/justify your position regarding _____

Being a student is like _____

Donna Rae Clasen (1991)

Teaching Critical Thinking: Eight Ways to Fail (Sternberg):

- 1. The teacher is the teacher and the student is the learner.**
 - (Teachers lack openness and receptivity of students)
 - (Teachers too often rely on supposed expertise over intuitions)

- 2. Critical thinking is only the students' job.**
 - (Administrators want answers instead of careful thought)
 - (Teachers want to be told what package will work best)

- 3. Need to find the best program.**
 - (No program is best)
 - (Programs vary--need to consider goals)

- 4. Program decisions will be dichotomous, either or decisions.**
 - (Few choices are binary; most involve combinations)
 - (Need both separate and infused instruction)
 - (Need both analytical and synthesis skills)

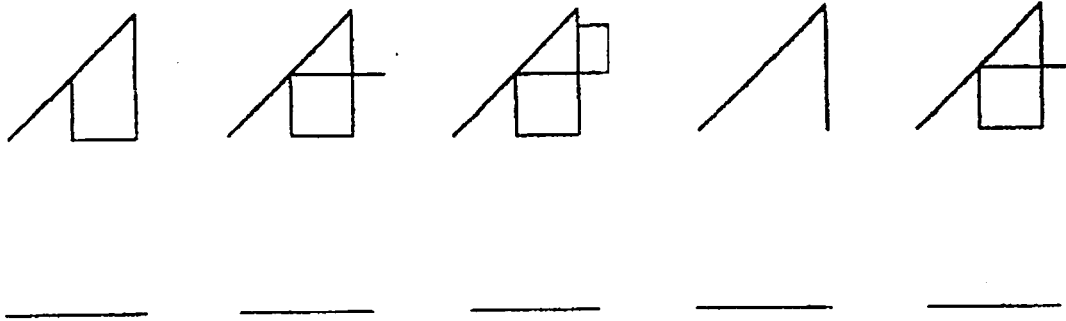
- 5. What really counts is the right answer, not rationale.**
 - (Need to be able to back up answers/guesses)
 - (When think well, can generate good answers)

- 6. Class discussion is just a means to an ends.**
 - (Class discussion is legitimate in its own rights)
 - (Thought emerges as a social process)
 - (Who owns ideas less important than generating useful ones)
 - (Class discussion is as imp't as written products)

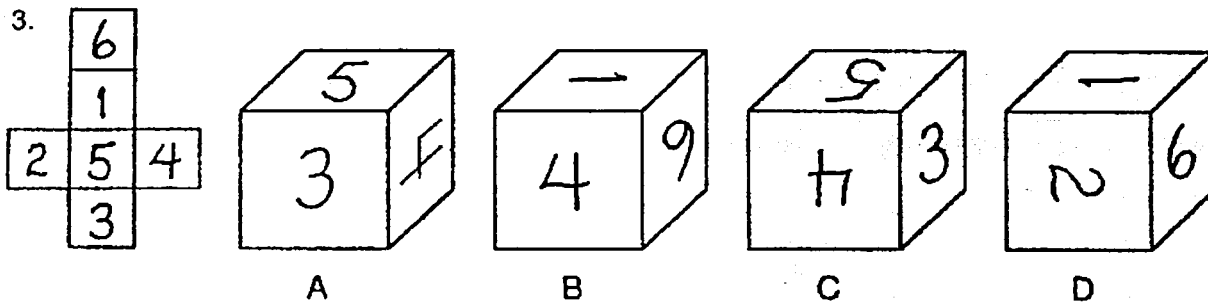
- 7. Mastery learning principles apply to critical thinking.**
 - (There is no "ceiling" level of performance)
 - (You can't be 80% correct on a critical thinking test)
 - (Need to approach deep & complex probs in deep & complex ways)
 - (Everyone could improve their critical thinking skills)

- 8. The job in a critical thinking course is to teach critical thinking.**
 - (Allow students to teach themselves; teachers become the facilitators)
 - (Students must find own methods of prob finding and prob solving)
 - (You cannot "teach" a student to think for him/herself)
 - (Don't always pose the problem for the student; let them find problems)

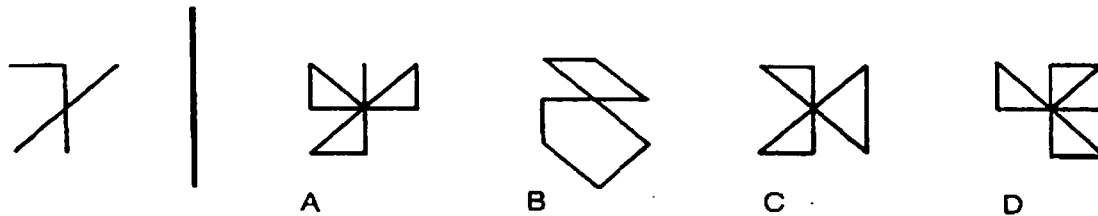
In what order were these drawings made (simplest to most complex)?



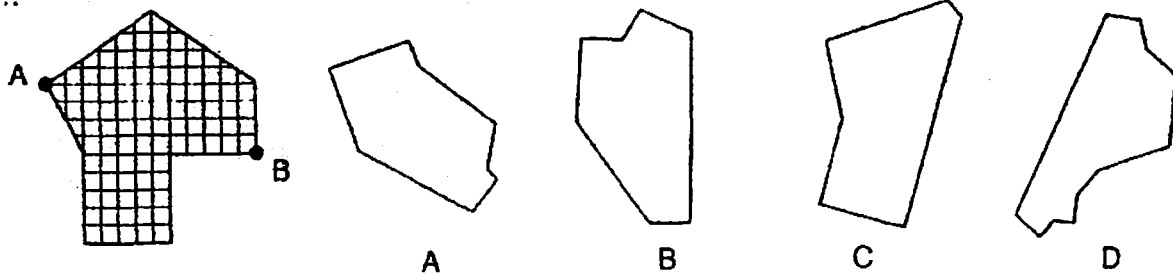
If the pattern on the left is folded into a cube, which cube shows the correct pattern?



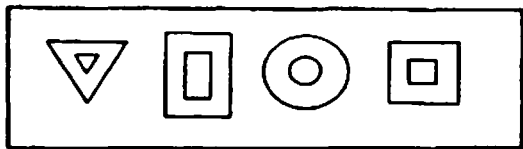
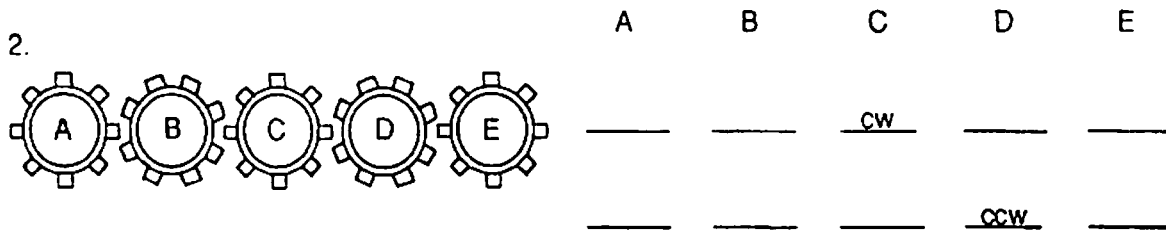
The drawing on the left is in the same position in one picture in the row. Find the picture.



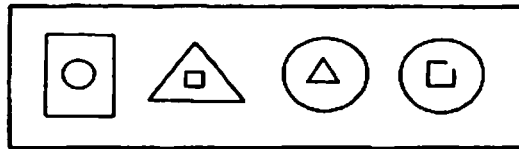
Fold point A to point B. What will the resulting shape look like?



Which direction will each gear turn? Clockwise (cw) or Counterclockwise (ccw)?

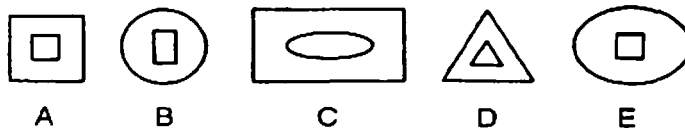


These are all Kloppers.



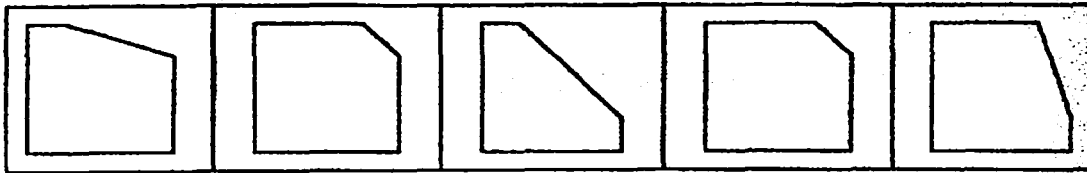
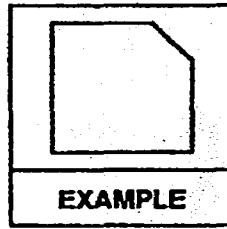
These are not Kloppers.

3. Which of the following are not Kloppers? Draw a ring around each letter.

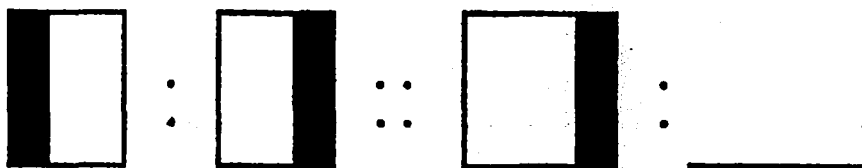
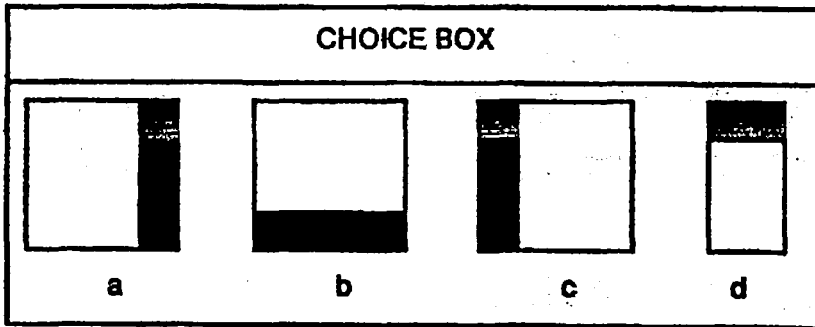


4. What must a Kloppe have? _____

Which figure does not match?



Which figures in the CHOICE BOX correctly complete each of the following analogies?



0000 205

CCTDI

A Disposition Inventory

Dr. Peter A. Facione
Santa Clara University

Dr. Noreen C. Facione
University of California, San Francisco

Wait for the instruction to begin.

CCTDI

DIRECTIONS:

1. Carefully separate the last page (ANSWER SHEET) from this test booklet.
2. Put your name on the answer sheet and on the test booklet.
3. Indicate how much you agree or disagree with each numbered statement by filling in the appropriate place on the answer sheet. Read the two examples first.

EXAMPLE A: **The best things in life are free.**

EXAMPLE B: **I'm always doing more than my share of the work.**

The answer sheet shows the responses of someone who
STRONGLY DISAGREES with EXAMPLE A
and **LESS STRONGLY AGREES** with EXAMPLE B.

Begin with statement number 1 and continue through number 75. Mark your response on the answer sheet in the place with the corresponding number. If you erase a response, be sure the erasure is clean.

4. After you have responded to the 75 statements, fill in the information items printed at the bottom of page 5.
-

1. **Considering all the alternatives is a luxury I can't afford.**
2. **Studying new things all my life would be wonderful.**
3. **The best argument for an idea is how you feel about it at the moment.**
4. **My trouble is that I'm easily distracted.**
5. **It's never easy to decide between competing points of view.**
6. **It bothers me when people rely on weak arguments to defend good ideas.**

7. **The truth always depends on your point of view.**
8. **It concerns me that I might have biases of which I'm not aware.**
9. **I always focus the question before I attempt to answer it.**
10. **I'm proud that I can think with great precision.**
11. **We can never really learn the truth about most things.**
12. **If there are four reasons in favor and one against, I'd go with the four.**
13. **Men and women are equally logical.**
14. **Advice is worth exactly what you pay for it.**
15. **Most college courses are uninteresting and not worth taking.**
16. **Tests that require thinking, not just memorization, are better for me.**
17. **I can talk about my problems for hours and hours without solving anything.**
18. **Others admire my intellectual curiosity and inquisitiveness.**
19. **Even if the evidence is against me, I'll hold firm to my beliefs.**
20. **You are not entitled to your opinion if you are obviously mistaken.**
21. **I pretend to be logical, but I'm not.**
22. **It's easy for me to organize my thoughts.**
23. **Everyone always argues from their own self interest, including me.**
24. **Open-mindedness has limits when it comes to right and wrong.**
25. **It's important to me to keep careful records of my personal finances.**

26. When faced with a big decision, I first seek all the information I can.
27. My peers call on me to make judgments because I decide things fairly.
28. Being open-minded means you don't know what's true and what's not.
29. Banks should make checking accounts a lot easier to understand.
30. It's important to me to understand what other people think about things.
31. I must have grounds for all my beliefs.
32. Reading is something I avoid, if possible.
33. People say I rush into decisions too quickly.
34. Required subjects in college waste time.
35. When I have to deal with something really complex, it's panic time.
36. Foreigners should study our culture instead of us always trying to understand theirs.
37. People think I procrastinate about making decisions.
38. People need reasons if they are going to disagree with another's opinion.
39. Being impartial is impossible when I'm discussing my own opinions.
40. I pride myself on coming up with creative alternatives.
41. Frankly, I am trying to be less judgmental.
42. Frequently I find myself evaluating other people's arguments.
43. I believe what I want to believe.
44. It's just not that important to keep trying to solve difficult problems.

45. I shouldn't be forced to defend my own opinions.
46. Others look to me to establish reasonable standards to apply to decisions.
47. I look forward to learning challenging things.
48. It makes a lot of sense to study what foreigners think.
49. Being inquisitive is one of my strong points.
50. I look for facts that support my views, not facts that disagree.
51. Complex problems are fun to try to figure out.
52. I take pride in my ability to understand the opinions of others.
53. Analogies are about as useful as a sailboat on a freeway. ?
54. You could describe me as logical.
55. I really enjoy trying to figure out how things work.
56. Others look to me to keep working on a problem when the going gets tough.
57. Getting a clear idea about the problem at hand is the first priority.
58. My opinion about controversial topics depends a lot on who I talk to last.
59. No matter what the topic, I am eager to know more about it.
60. There is no way to know whether one solution is better than another.
61. The best way to solve problems is to ask someone else for the answers.
62. Many questions are just too frightening to ask.
63. I'm known for approaching complex problems in an orderly way.

- 64. Being open-minded about different world views is less important than people think.
- 65. Learn everything you can, you never know when it could come in handy.
- 66. Life has taught me not to be too logical.
- 67. Things are as they appear to be.
- 68. If I have to work on a problem, I can put other things out of my mind.
- 69. Others look to me to decide when the problem is solved.
- 70. I know what I think, so why should I pretend to ponder my choices.
- 71. Powerful people determine the right answer.
- 72. It's impossible to know what standards to apply to most questions.
- 73. Others are entitled to their opinions, but I don't need to hear them.
- 74. I'm good at developing orderly plans to address complex problems.
- 75. To get people to agree with me I would give any reason that worked.

Please respond to these final items in the places provided on this page.

Name (last/first) _____ / _____

I.D. _____

Date of Birth (month/day/year) ____/____/____

Circle one: Female, Male

Grade Level: 7th, 8th, 9th, 10th, 11th, 12th, College1, Col2, Col3, Col4, BA/BS, MA/MS, PhD/JD/MD

When I graduate [graduated] from college, I probably will have [did] major in: _____

I am pursuing [expect to pursue] a career as a: _____

Externalizing the Critical Thinking in Knowledge Development and Clinical Judgment

by

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ABSTRACT

Critical thinking, defined as purposeful self-regulatory judgment, is comprised of a core set of cognitive skills -- such as analysis, inference, and evaluation - - and a set of personal dispositional attributes -- such as open-mindedness and maturity. Described in the language of this national consensus construct, CT is centrally evident in nursing knowledge development and expert clinical judgement. A holistic CT scoring rubric, a framework for CT individual and group presentations, and a case study strategy for training and nurturing CT in students illustrate that the CT in nursing knowledge development and clinical judgment can be externalized, identified, modeled and measured.

Critical thinking (CT), defined as *purposeful self-regulatory judgment*,¹ is the cognitive engine driving the processes of knowledge development and **clinical judgment in nursing**. Since 1990 this robust concept of CT has become the conceptual architecture used to achieve national consensus among hundreds of educators, employers, and policy makers with regard to those cognitive skills and personal dispositional attributes which form the core of CT.² Using the vocabulary of this national, cross-disciplinary consensus definition of CT, this paper demonstrates how knowledge development and clinical judgment employ those cognitive skills and personal dispositional attributes. The paper forgoes the standard philosophical summary of hypothesized relationships between knowledge development, clinical judgment and the array of cognitive models of thinking -- work that has been presented well elsewhere.³⁻¹² Instead, to illustrate its thesis, this paper describes recent advances in the national consensus construct of CT, links that consensus to discussions of nursing knowledge development and to the process of clinical judgment, and provides three actual illustrations of pedagogical and measurement devices geared to externalize the CT embedded in the processes of knowledge development and clinical judgment.

Emergence of a cross-disciplinary, national consensus concept of CT

Nationally, CT has been identified as essential to knowledge development, professional practice, and the development of an educated public, so that we may address the international and local social, economic, educational, environmental, and health challenges of the 21st Century.¹³⁻¹⁵ As a result of this growing focus on the CT component of knowledge development and professional judgment across the disciplines, recent

research has increasingly centered on defining criteria to measure CT¹⁶⁻¹⁷ and designing effective strategies to teach CT skills and nurture CT dispositional attributes.^{14,16,19-21}

Although many nurse researchers and educators currently struggle to draw connective lines between clinical judgment processes and CT processes, the national debate on the importance of CT would suggest that a more basic relationship should be examined: the cognitive and epistemological integration of CT and clinical judgment embedded in clinical practice and the development of nursing knowledge. The consensus construct of CT described here¹ strongly overlaps the construct of clinical judgment as articulated in the literature. In the clinical context, the nurse adept at CT would be expected to draw judiciously on developed nursing knowledge in forming or evaluating a clinical judgment. A nurse researcher engaged in the generation of new nursing knowledge or testing previously developed nursing theory, would be expected to use CT to reflectively analyze, interpret, evaluate, infer, and explain evidence and hypotheses. Indeed, this intersection of constructs is at the heart of the challenge for theory and knowledge guided clinical practice.

In 1990 the American Philosophical Association commissioned a Delphi study to explore a cross-disciplinary definition of CT.¹ Since that time, this definition has been utilized to address the US Department of Education's Education Goals: 2000¹³ mandate¹⁴ and has been the framework of a replication study of the definition and valuation study of CT by educators, employers and policy makers.² In 1994, at national forums of the American Association of Higher Education,²² the American Educational Research Association,²³ and the International Conference on Thinking,²⁴ theoreticians and scientists have reinforced the consensus regarding the CT construct.^{2,17,25-26} The APA consensus demanded that in using one's CT skills to reflectively form a purposeful judgement (in thinking critically) one must take into consideration evidence, conceptualizations, methodologies, criteria, and contexts.¹ Thus understood, CT is a particularly central phenomenon in practice disciplines. As a guide to knowledge development in nursing, this consensus definition might be measured against Meleis'³ call for a process framework for nursing science and knowledge development that demands theoretical connections between believed facts and practical observation. Figure 1 identifies the core CT skills as outlined in the APA consensus report.¹

At the same time, an increasing emphasis on the importance of the dispositional side of CT has been stressed by experts in CT teaching and assessment.²⁵⁻²⁹ The personal disposition toward CT would lead one to approach solutions to one's ill-structured problems through the use of one's CT skills, versus using some other less rational situational strategy (eg. appeal to other authority, implementing a rote protocol, guessing, ignoring). Figure 2 displays summary descriptions of dispositional attributes of CT. These attributes also derive from the APA Delphi description of the ideal critical thinker through subsequent empirical research projects.²⁸⁻²⁹

Figure 1

Critical Thinking Cognitive Skills and Sub-Skills

- | | |
|-------------------------|---|
| Interpretation: | <ul style="list-style-type: none"> ⊗ Categorization ⊗ Decoding Sentences ⊗ Clarifying Meaning |
| Analysis: | <ul style="list-style-type: none"> ⊗ Examining Ideas ⊗ Identifying Arguments ⊗ Analyzing Arguments |
| Evaluation: | <ul style="list-style-type: none"> ⊗ Assessing Claims ⊗ Assessing Arguments |
| Inference: | <ul style="list-style-type: none"> ⊗ Querying Evidence ⊗ Conjecturing Alternatives ⊗ Drawing Conclusions |
| Explanation: | <ul style="list-style-type: none"> ⊗ Stating Results ⊗ Justifying Procedures ⊗ Presenting Arguments |
| Self-Regulation: | <ul style="list-style-type: none"> ⊗ Self Examination ⊗ Self Correction |

From: "Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction," The Delphi Report (1990).

Figure 2

Critical Thinking Dispositions

- Truthseeking:** A courageous desire for the best knowledge, even if such knowledge falls to support or undermine one's preconceptions, beliefs or self interests.
- Open-Mindedness:** Tolerance to divergent views, self-monitoring for possible bias.
- Analyticity:** Demanding the application of reason and evidence, alert to problematic situations, inclined to anticipate consequences.
- Systematicity:** Valuing organization, focus and diligence to approach problems of all levels of complexity.
- Self-Confidence:** Trusting of one's own reasoning skills and seeing oneself as a good thinker.
- Inquisitiveness:** Curious and eager to acquire knowledge and learn explanations even when the applications of the knowledge are not immediately apparent.
- Maturity:** Prudence in making, suspending, or revising judgment. An awareness that multiple solutions can be acceptable. An appreciation of the need to reach closure even in the absence of complete knowledge.

From: "The California Critical Thinking Dispositions Inventory": (C) Facione, N.C. & Facione, P.A. (1992).

The centrality of CT in nursing

The conceptual definition of CT, containing clear reference to both skills and dispositional attributes, has particular application to descriptions of nursing knowledge development. Even the short summary of the APA Delphi consensus definition shown here is in symmetry with descriptions of developing a nursing knowledge base by carefully examining and delimiting key concepts/constructs and clarifying meanings, categorizing phenomena, identifying assumptions, testing relationships/hypotheses/theories, as well as conjecturing alternatives for testing, justifying procedures, and stating findings. All are manifestations of CT skills. The concern that nursing knowledge development should embody a search for best knowledge in a given context demands an openness to new evidence and a willingness to reconsider judgments, values a focused and diligent approach, and requires tolerance of multiple perspectives/interpretations when those perspectives/interpretations can be supported by reasons and evidence. All are CT dispositional attributes.

Broadly conceived, CT can be characterized as purposeful, self-regulatory judgment, a human cognitive process. As such, CT is a pervasive human phenomenon which can be evident (at least on occasion) in problem solving, decision making, reasoned inquiry, professional practice, and everyday life. CT is a non-linear, recursive process in which a person forms a judgment about what to believe or what to do in a given context. In so doing a person engaged in CT uses a core set of cognitive skills -- analysis, interpretation, inference, explanation, evaluation, and self-regulation -- to form that judgment and to monitor and improve the quality of that judgment. CT is non-linear and recursive to the extent that in thinking critically a person is able to apply CT skills to each other as well as to the problem at hand. For example, one is able to explain one's analysis, analyze one's interpretation, or evaluate one's inference.¹

A recent model of clinical decision-making proposed by Gordon and colleagues⁹ is strongly congruent with this APA Delphi description of the CT process. Although the Integrated Model of Diagnostic-Therapeutic and Ethical Reasoning is unfortunately depicted with directional arrows suggestive of linear processing, the authors' description is much richer. The integrated model proposed by Gordon and colleagues comfortably fits within the language of CT. The reasoning occurring within their description of clinical judgment is CT. Rather than the unexplained and apparently opposed categories of "nursing reasoning" and "ethical reasoning," clinical judgment integrates both because the common engine is CT. The three examples in this paper are intended to illustrate this important point. CT along with content knowledge and practical experiences are the three essential components of clinical judgment. One interprets to decode relevant information and to determine its position in the organizational structure of the knowledge base. One analyzes to identify clinical problems, gaps in the knowledge base, warranted and unwarranted assumptions and judgments. One uses evaluation to determine the warranted and preferable alternatives from unwarranted or less optimal. One infers theoretical and observable relationships. And one self-regulates, confirms, corrects, one's reasoning through meta-cognitive reflection, a process of thinking critically about one's thinking critically. One way to evaluate the utility of this theoretical definition of CT relative to nursing knowledge development and clinical judgment (a CT exercise in itself), is to ask "Does CT offer a sound guide for the development of measures to assess our performance of clinical judgment?" If so, one should be able to use the language of this consensus definition to create assessment devices to measure the CT component of scientific presentations and/or demonstrations of clinical judgment.

A rubric for assessing CT in clinical judgment and knowledge development

What would a criterion measure of CT in the context of knowledge development look like? Certainly it would use the terminology of the consensus definition to describe CT skills. And, equally, it would make explicit references to which specific cognitive actions would represent CT in the knowledge-related performance that was to be assessed. In our first illustration, the language of the consensus definition is embedded in a rubric (Figure 3) for the global assessment of CT. This expert rating scale could be used to rate a case presentation in the clinical setting, as one data point in a multi-modal plan for curriculum assessment, or to score a nursing theory paper written in response to a classroom assignment. As an assessment device, all of the considerations for inter-rater reliability pertain with the use of such a rubric. It might, more informally, be internalized as a check-list for a meta-cognitive evaluation of theory or research presentation of new knowledge.

Figure 3

Holistic Critical Thinking Scoring Rubric

Facione and Facione

- 4** Consistently does all or almost all of the following:
- Accurately interprets evidence, statements, graphics, questions, etc.
 - Identifies the salient arguments (reasons and claims) pro and con.
 - Thoughtfully analyzes and evaluates major alternative points of view.
 - Draws warranted, judicious, non-fallacious conclusions.
 - Justifies key results and procedures, explains assumptions and reasons.
 - Fair-mindedly follows where evidence and reasons lead.

- 3** Does most or many of the following:
- Accurately interprets evidence, statements, graphics, questions, etc.
 - Identifies relevant arguments (reasons and claims) pro and con.
 - Offers analyses and evaluations of obvious alternative points of view.
 - Draws warranted, non-fallacious conclusions.
 - Justifies some results or procedures, explains reasons.
 - Fair-mindedly follows where evidence and reasons lead.

- 2** Does most or many of the following:
- Misinterprets evidence, statements, graphics, questions, etc.
 - Fails to identify strong, relevant counter-arguments.
 - Ignores or superficially evaluates obvious alternative points of view.
 - Draws unwarranted or fallacious conclusions.
 - Justifies few results or procedures, seldom explains reasons.
 - Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.

- 1** Consistently does all or almost all of the following:
- Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others.
 - Fails to identify or hastily dismisses strong, relevant counter-arguments.
 - Ignores or superficially evaluates obvious alternative points of view.
 - Argues using fallacious or irrelevant reasons, and unwarranted claims.
 - Does not justify results or procedures, nor explain reasons.
 - Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.
 - Exhibits close-mindedness or hostility to reason.

Before a performance or presentation can be rated for the quality of its CT, that thinking must be, in some manner, manifest. Towards that end, we must train ourselves, our colleagues and our students to externalize their thinking for others to evaluate. Although standards for knowledge presentation have traditionally implied that the presenter supply evidence of the quality of the process as well as the results of their scientific or clinical exploration, the realities of knowledge transmittal (the completed test or paper with its time limits and page limitations, as an example) lead to the emphasis being placed on the product or results. The challenge is to provide a means for evaluation of the CT process that was integral to the resulting clinical judgment or developed knowledge. Understanding that earning a positive evaluation is based in part on displaying the skills and dispositions described in the "4" and "3" range of the Holistic CT Scoring Rubric, and that evidence of falling in the "2" or "1" ranges shows poor thinking, not only facilitates the measure of CT but motivates the demonstrable use of CT in a variety of teaching, research, and practice settings.

A framework for externalizing CT in clinical or theoretical presentations

Our second illustration suggests criteria we might demand of scientific presentations, clinical conferences, or classroom group presentations, to assure a way to assess the new scientific information, clinical data, or theoretical position being advanced. This particular exercise is cast in the form of a classroom assignment for a course in nursing ethics. It assumes that students are as yet untrained in the demand of externalizing their CT in relation to their expression of applying relevant knowledge to an ethical problem and arriving at a judgment, and as a result gives explicit prompting regarding providing observable evidence of the CT inherent in their performance preparation. The explicit prompting provides a list of criteria that might be expected of all presentations of scientific and clinical information and its interpretation contributing to knowledge development.

CT Framework for Group or Individual Presentations

Directions: The following are guidelines for preparation of your presentation in medical ethics. These guidelines should not be approached in a step-wise or linear fashion. Rather, the guidelines are suggested as an interactive framework to drive your presentation and critique process. Your presentation should provide your audience with knowledge of your thinking process and criteria in choosing the position you plan to announce or defend rather than merely presenting a listing of possible opinions or conclusions. It will be important that you show that you considered alternatives fair-mindedly. You are expected to provide the reasons and evidence for the positions you take, descriptions of the other alternative positions considered but rejected, and the considerations you found to be decisive in forming your judgment

Choose one of the following topics:

- 1) Prohibiting health care services delivery to illegal aliens;
- 2) Nurse assisted suicide;
- 3) Limitations on the use of fetal tissue.

You will want to present

Definitions and meanings of key concepts and relationships being advanced as central to the issue.
 Main and secondary arguments or claims being advanced.
 Evidence for the reasonableness of the claims being made.
 Considerations, pro and con, for the various positions, strategies espoused.
 Assumptions and probable consequences of espousing various positions.
 A justification for the position you recommend be taken in relation to your analysis.
 The relevance of the position to guide professional practice and research.

To check your judgment process, you will want to assess if the following criteria apply:

Openness to new ideas even if they fail to support existing preconceptions, beliefs or self interests?

Demand for the application of reason and evidence.

Tolerance to all divergent points of view supported by contextual evidence.

Anticipation of the consequences of the arguments espoused.

Focus and diligence in the approach to the issue(s).

Prudence in making, suspending, or revising judgments.

Fair consideration of all reasonably possible solutions/positions.

As is evident from analyzing the above presentation guide in the light of Figure 1 and Figure 2, the first list guides one in externalizing the CT skills which structure the presentation. The second list of criteria encourages a meta-cognitive self-regulation of the dispositional approach of the presenter. The lists, taken together, comprise the criterion by which one would assess the presentation for its contribution to knowledge development, whether this knowledge was situation specific to the clinical setting or generalizable to a wider application. Such criteria as these which examine the thinking and judgments made by those advancing new theoretical positions or relationships, provide a template for the assessment of validity and reliability in new information presentations. Using such criteria, we might better judge where assumptions are as yet untested. We might make better estimates of the probability that this new information constitutes new knowledge.

A pedagogical guide for modeling, training and nurturing CT

The CT component of science and practice requires a constant reassessment of the nature of the problem and of what constitutes relevant new information, criteria for action, evidence of status and change, and individual context. But CT is believed to be more than a collection of thinking skills that one applies by rote to a given problem situation. "Rote application of CT skills" is an oxymoron. The key to CT is meta-cognitive reflection on what one is doing and why. Ideally CT becomes a habit of mind, a part of one's character. How do we develop this habit of mind that will support excellence in knowledge development? The APA Delphi research suggested that teaching CT was "most effective if the instructor models CT dispositions and the proper use of CT skills in the very process of instruction" (Recommendation 14, APA, 1990). In effect, by one's own example one mentors students in the use of CT, engaging them in CT in order to develop in them both the skills and the personal dispositional attributes.

One opportunity to model CT is in scientific collaborations, another is to expect it as a standard in written communications of theoretical and research papers, and a third is to demand it in the classroom where new scientists/clinicians are introduced to the need for knowledge development.

Our third illustration uses the language of the consensus construct to guide a clinical conference (or classroom session) designed to train the use of CT in the application of nursing knowledge and theory in the clinical setting. This pedagogical guide identifies the CT embedded in a discussion of a clinical case while demonstrating a methodology for engaging students in CT to arrive at clinical judgments about the patient involved. The nurse educator could select for discussion a clinical patient with complex problems who is known to all the students or a hypothetical case targeting desired curriculum content areas. This example involves a hypothetical gentleman with squamous cell carcinoma of the head and neck who is scheduled for laryngectomy surgery.

A Classroom CT Exercise for Clinical Nursing Students:

The initial presentation of the situation: Mr. Reginald Jackson, a 50 year old automobile salesman, has been diagnosed with throat cancer related to his cigarette smoking.

The opening question: "What is the significance of Mr. Jackson's impending total laryngectomy and left radical neck dissection surgery to treat his cancer of the hypopharynx?"

The question is designed to be abstract and open-ended. Although it may elicit a trial balloon response from a more confident critical thinker in the class, (perhaps the ideal response is "Significance to whom?"), it may also be met by silence. Probably the group will demand that you interpret the question for them, but of course you will resist. If necessary, you might *paraphrase the question* [Interpretation]. "How might we approach the care of Mr. Jackson?" If it should become necessary to stimulate discussion or focus abstractions, you might ask, "What meaning will the surgery have for his physical, psychological, and social functioning?"

The initial time you employ this pedagogy students might express resistance to this non-didactic approach to knowledge delivery. While some may feign invisibility, praying that the class will return to normal lecture room status, the more eager thinkers among them will commence to *decode the informational content and significance* [Interpretation] of the question you have so insistently posed. Later, students will become accustomed to being required to access their own knowledge base to address a clinical problem (an authentic clinical demand) and will become more eager to engage in this type of an exercise. Eventually, the students will offer various hypothesized [Inference] physical, social or psychological "meanings" and "significance," interspersed with queries [Analysis] to gain more facts about Mr. Jackson, their shared patient. This is when you might request someone to *categorize these hypotheses* [Interpretation]. Invite one student to work at one part of the chalk board and ask another to record the developing patient data base. Demonstrations of *formulating categories and creating frameworks* [Interpretation] will thus be given by the two students at the board.

Do not correct errors or short-comings you might observe being made. The board work will be monitored by the other students in the classroom [Evaluation]. After enough material accumulates on the board, ask the class whether they think the developing chalk board accounts are accurate [Interpretation, Evaluation] and adequate [Inference, Group CT-Self Regulation]. Invite editing as necessary, requiring reasons for changes [Explanation]. This will provide you a way to observe students that are *examining, checking and correcting the produced results*. Self-regulation, the most difficult CT skill to assess since it is an internal cognitive event, can be heard when students offer comments such as "At first I thought (X) but now I think (Y) because..." a comment that evidences reconsideration of formed evaluations in light of the evidence given as "because..."

The class proceeds to *identify the significant relationships* [Analysis] that are intended to occur and to *conjecture about what actual relationships will ensue* [Inference] as a result of Mr. Jackson's surgery [Analysis]. They will begin to *examine ideas* [Analysis] by identifying the issues or problems and determining the component parts. In the course of the class, students will press for context about this gentleman as they struggle to interpret, analyze, evaluate, infer, and explain, in short to use CT to explore his problems. You will supply more and more context, but only as it is specifically demanded, perhaps putting it on the board or overhead to create the patient data base. (He may be an automobile salesman, and smoke three packs of cigarettes a day, for instance.) At times you should not "know the answer" about Mr. Jackson. Just as in real life, sometimes data is missing and it is necessary to make judgments or come to reasonable closure without absolute certainty. It is important that students be required to *give reasons that justify* [Explanation] the interventions they propose.

Ask the question: "Why do you think that would be the best intervention?" Guide students to make explicit the alternative interventions they may have cognitively explored [Inference]. Training communication in clinical decision-making improves patient safety both in clinical instruction and in clinical practice by minimizing misinterpretations, mistaken evaluations, and rash generalizations.

Nurture the disposition toward CT. It is vital to minimize ridicule by instructors or peers during this process lest students stop sharing their thinking process. Students who risk offering a critique of received wisdom should be rewarded for their efforts, praised for new insights, and guided through the process of theory exploration and testing until CT becomes a habit of mind. You can replicate the CT process by advancing the problem.

Ask the question: "How will we plan for his rehabilitation?"

Expected Outcomes of this Exercise:

1. Students will *infer what information must be gathered to identify and interpret* the anatomical implications of laryngectomy, the changes to the gastrointestinal and respiratory systems, the loss of taste related to diminished olfactory ability, problems of radiation induced stomatitis, the loss of accustomed communication during mealtime.
2. They will *assess and explain* all particular peri-operative nursing care necessitated by laryngectomy surgery, *justifying their plan of care with reasons* supported by nursing knowledge.
3. The students will *identify and evaluate* the physical and psycho-social implications of altered communication ability and loss of natural voice, the value of electro-larynx devices and esophageal speech, the need for voice therapy and possibly counseling.
4. The students will *explain* the implications of nicotine addiction and withdrawal on the peri-operative period and *draw inferences* about the health guidance needed for long term rehabilitation.
5. The students will *assess and examine* the severe disruption in Mr. Jackson's ability to earn a living selling automobiles, and in the course of this assessment they will *conjecture about possibilities and draw conclusions* about his need for short and long term disability, his needs for interacting with his employer, and his needs for handling his medical expenses.
6. The students will *conjecture* about Mr. Jackson's psycho-social needs and *conclude* that he will likely require support to cope with possible family problems, adjustment to a cancer diagnosis, his changed self image, and a moderately poor long term survival prognosis.

An evaluation of the consensus definition

Use of the cross-disciplinary consensus definition of CT to frame exercises and measurement devices of the CT component of clinical judgment, such as the three given above, would appear to have resulted in a consistency of language with regard to the criteria expected in oral and written presentations of clinically related cases, ethical positions, and guiding theory. Although these are merely examples of the type of exercises and presentation guidelines that could be used to externalize the CT portion of knowledge development and clinical judgment, they would appear to offer exciting promise for a new focus on the measurement and evaluation of the thinking process behind knowledge development.

Some such measures of CT can be discipline neutral, as is the Holistic CT Scoring Rubric and the Framework for Individual and Group Presentations. Discipline neutral devices must be focused on discipline specific problems or questions, however, to be useful. Or, the devices can be set in a discipline specific context through and through, as is the Reginald Jackson case analysis example. These devices can be structured to gather both quantitative and qualitative data for theory testing. They can assess CT components of hypothesis testing, position papers, or prepared student and scientific presentations. Carefully designed and properly implemented, they can authentically measure the CT component of clinical judgment in the clinical area.^{16,17}

Accountability for CT in knowledge development and clinical judgment

To assess CT in either research or clinical decision-making, one's thinking process must be externalized for others to observe and evaluate. For example, to permit educators to assess clinical judgment in their students, the processes of making those judgments must be readily apparent by being spoken, written, or demonstrated. The challenge for our discipline is to externalize our own CT processes as scientists, clinicians, and educators. This is what we mean when we say "model critical thinking in our teaching of clinical judgment." Through repeated dialogue with scientist and clinician colleagues and through patient training of our students we must increasingly externalize our interpretations of new data, analyses and inferences in relation to guiding theory and our evaluations and meta-cognitive reconsiderations of nursing knowledge.

Meeting this challenge will aid in our ability to assess our students' CT, one parameter of their clinical judgment expertise. It will also organize our approaches to test theory in the context of explicit assumptions and the judicious acceptance of new information as representative of nursing knowledge. Our efforts to develop nursing knowledge to guide clinical practice are well served by the criteria suggested as representative of good CT. As illustrated here, defining, teaching, and measuring CT are neither mysterious nor enigmatic. Rather, good CT can be pervasively evident in sound nursing knowledge development and expert clinical judgment.

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Brainstormed List of Some Thinking Skill Techniques for Teachers

Activity at home:

a. which are primarily creative thinking (cr) related?

b. Which are primarily critical thinking (ct) related?

- 1. critiques
- 2. journal logs
- 3. free writing (a wet ink)
- 4. writing to think
- 5. think-pair-share
- 6. show & tell
- 7. mock trials
- 8. simulations and role play
- 9. force field analysis (plus, minus, interesting--PMI; for, against, or neither)
- 10. fishbowl
- 11. 6 hats game
- 12. Socratic questioning-incomplete teaching
- 13. case-based reasoning
- 14. question probes
- 15. idea checklists and idea spurring questions
- 16. attribute listing
- 17. attribute modification and transformation
- 18. synectics--forced associations (e.g., how is life like a supermarket?)
(direct (e.g., how have animals solved this problem), personal (if I were a computer, how would I feel), and fantasy (how can we get streets to clean themselves) analogies)
- 19. metaphorical thinking
- 20. checkerboarding
- 21. morphological synthesis
- 22. graphic organizers (webbing, semantic mapping, concept maps)
- 23. brainstorming
- 24. reverse brainstorming
- 25. nominal group process
- 26. working backward
- 27. pruning the tree
- 28. creative dramatics
- 29. breaking set
- 30. jigsaw
- 31. reciprocal teaching
- 32. three level reading questions/guide (literal, comprehension, interpretative)
- 33. other points of view (OPV) (if became the president of _____)
- 34. alternative, possibilities, and choices (APC); considering all factors and consequences
- 35. self-verbalization, think alouds, and modeling
- 36. mnemonics
- 37. active listening and wait time
- 38. separate wants from needs
- 39. reorganization, rearranging of facts (e.g., what if? suppose that...)
- 40. advance organizers
- 41. debates
- 42. reflection activities
- 43. whack in side of the head; kick in the seat of the pants (e.g., whack stack--cards)

TEACHING THINKING: THINKING STRATEGIES TO USE IN TEACHING CLASSROOM CONTENT

CRITICAL THINKING STRATEGIES

Questioning for:
analysis
synthesis
evaluation
interpretation

Seeking justification: Requiring support for opinions/hypotheses

Comparing and Contrasting
Attribute Listing

Finding Patterns
Recognizing Relationships

Identifying inferences vs. assumptions

Distinguishing relevant from irrelevant

Analyzing truth claims:
credibility of sources, bias,
personal agenda

Sequencing

Predicting

~~Guessing~~
Guessing and Testing
Deductive Thinking
Inductive Thinking

DECISION MAKING

Stating desired goal (s)

Recognizing obstacles
Separating wants/needs

Identifying ways of overcoming obstacles

Analyzing alternatives

Ranking alternatives
Selecting criteria
Identifying short- and long-term costs and benefits
Recognizing impact of feelings

Choosing a solution

CREATIVE THINKING STRATEGIES

Questioning for:
quantity (e.g. brainstorming)
reorganization (Suppose that...;
What if ...)
forced analogy
viewpoint/role playing

Seeking justification: Supporting ideas

Creative Extensions:
Elaborating upon content in unique ways

Analogic Thought: Seeking various forms of representation

Providing opportunities which encourage fluency (many ideas); flexibility (ideas used in many different ways); Originality (unique approaches); and elaborations (building on)

PROBLEM SOLVING

Recognizing a problem area

Identifying a specific problem from a larger "mess"

Formulating hypothesis(es)

Collecting data

Analyzing data

Drawing conclusions

Generating several solutions

Selecting criteria for solutions

Choosing the "best" solution

D.R. Clasen, UW-Whitewater, 1988

Checkerboarding/Morphological Synthesis

Critical Strategies

Creative Strategies	1.	2.	3.	4.	5.	6.
1.						
2.						
3.						
4.						
5.						
6.						

DATE 2/9/10

Checkerboarding/Morphological Synthesis

Creative, Critical, Cooperative Strategies

Motivational Strategies	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										

Checkerboard Ideas

(1995) Center Grove

Puzzlebowl (Fishbowl & Jigsaw)
Jigsaw Newsletter (Jigsaw & Newsletter)
Mnemonic Newsletter (Mnemonics, Newsletter)
Wet Up! (Sum up, Wet Ink)
Think Tree (Pruning Tree, Think Sheet)
What if tree (Pruning Tree, What if)
Dramatic Comparisons (Compare, Contrast/Dramatics)
Dramatizing guided learning journal (Guided learning journal, creative
dramatics)

Mythical Relationships (Original myth, Discover relationships)
Student thought newsletter (Math newsletter, guided learning journal)
Game on Bloom's Taxonomy (Bloom's, Math project-games)
Alternative Role Play (Role play, Alternatives)
Jigsaw the Role Play (Jigsaw-teach graph ellipses/role play)
Attri-Map (Mind-map/Attribute listing)
Story Problem Skit (Diagrams for story problems/Creative Dramatics)
KWL (Checkerboarding, KWL)
GOSH! (Graphic Organizers, six hats)
GRoW (Graphic Organizers, Webbing)
Six Blooming Hats (Bloom's/Six Hats)
SEW (Story Ending/Webbing)

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Table 2: Async/Sync Pedagogical Ideas	General Structure	Feedback	Assessment	What to do?	Async or Sync Issues
1. Social Icebreakers (Cartoons)					
2. Learner-Content (Challenges, Quizzes, Self-Test, etc.)					
3. Scenario-Simulations					
4. Anonymous Suggestions					
5. Student Formative Surveys					
6. Role Play					
7. Case Labs & Experiments					
8. Authentic Data Analysis					
9. Just-in-Time Teaching					
10. Perspective Taking					
11. Webinar					
12. Know-You Rooms					
13. Synchronous Testing					
14. Sync Guest Expert Chats					
15. Online Team Meetings					
16. Threads + Author Chats					
17. Secret Coaches					
18. Collaborative Writing					
19. Online Mentoring					
20. Graphic Organizers					

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GLOSSARY: A Framegame for Reviewing Concepts

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Remember the **DICTIONARY** game in which the players try to fool the others with their fictional definitions of esoteric words? Here's a version of the game for reviewing technical terms from your workshop.

You can play **GLOSSARY** with any number of people from 3 to 30. With up to 6 people, play this as an individual game. With 6-30 people, divide them into three or more teams of approximately equal numbers.

The game description that follows is for the individual version. You should have no difficulty modifying it for the team version.

Each round of this game requires 3 minutes. Play at least three rounds.

Select a technical term (for example, *performance gap*). Distribute index cards to all players. Give 2 minutes for each player to write down a definition of the term, imitating the textbook definition that would be found in a the glossary section of a technical manual. Ask the players to put their initials on their definition cards. While the players are busy, copy the official glossary entry from the technical manual.

After 2 minutes, collect everyone's definition cards. Mix the official card with the others, shuffle them, and read one card at a time. Ask the players to try to identify the official definition from the technical manual.

Read each card again. After reading the card, ask players if anyone thinks it is the official card. Write down the number of players selecting each card.

This is how the scoring goes:

- Each card receives as many points as the number of players who thought it was the official card. These points belong to the player who wrote the card.
- Also, each player loses a point for being fooled by an unofficial card.
- Finally, players who chose the official card receive an extra point.

Play the game for a prespecified number of rounds. Use a different technical term for each round. For example, I used these terms for the next five rounds: *internal customer*, *input standards*, *process map*, *metric*, and *root cause*.

At the end of the last round, the player with the highest score is the winner.

GLOSSARY forces individuals and teams to review the critical features of various technical concepts. You can apply it to any technical subject-matter area.

Back to the Games page

[Previous](#) | [Home](#) | [Next](#)

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URL: <http://www.thiagi.com/game-glossary.html>

Revised: June 10, 1997

Goal Plan

**Briefly list a series of increasingly ambitious teaching and other professional goals.
Allow participants 5 minutes to complete. (Volunteers to share.)**

Goal Level	Use of Active Learning	Use of Active Learning with Technology	Other Professional Goals
Where I am Now...			
Reasonable Goals			
Higher Goals			
Even Higher Goals			
Obscenely High Goals			

COOPERATIVE

LEARNING:

THEORY,

PRINCIPLES,

AND

TECHNIQUES!!!

Cooperative Learning Activities

(A Common Quote: But I End Up Doing All The Work!)

a. 10+ Cooperative Learning Ideas: Generic

1. **Turn to your partner and...**(check work, review for test, discuss, think aloud)
2. **Think-Pair-Share**--think about prob, write down, share with partner & class.
(e.g., Video Segments--turn to partner and react, predict, compare pts)
3. **Roundrobin**--students contribute ideas orally in turn, clockwise or counterclockwise.
and/or **Roundtable**--one piece of paper is rotated around the table.
5. **Group discussion with roles** (e.g., the Johnson's Learning Together method)
checker, recorder, reporter, facilitator).
(Using with cases analysis or problem solving)
6. **Numbered Heads Together**--count off within each group 1, 2, 3, etc.; teacher calls on a #.
7. **Team-Tournaments (Slavin's STAD and TGT methods)**
gameshow competitions, quizzes, or tests in partnered teams.
8. **Jigsaw**--divide base group up, go to expert grp to learn, report back to base.
(Become an expert on an aspect of Native American culture)
9. **Group Investigation, Coop Coop**
(divide a topic into subtopics for each student in the group).
10. **One stay, three stray; or, Three stray, one stay.**
11. **Inside-Outside/Fish Bowl**--group on inside talk and outside listen and then switch roles.
12. **Gallery tours**--post student or group work and have them explain it to others.
13. **Stand and share**--when know the answer stand up and when hear it sit down.
14. **Response Value lines or human graphs**--on board or line-up for what you believe in.
(Solid waste disposal; PCB problems)
15. **Problem-Based Learning**--work on a major problem for unit or semester or year.
(e.g., develop a training program for PCB education in this area)
16. **Electronic Cafes, E-mail Distribution Lists, Asynchronous Conferencing**
(e.g., Assign students to start or wrap a weekly electronic class discussion)
17. **Structured Controversy**--debate in teams, switch roles, & come to a compromise position.

b. Quick Starter Small Group Activities:

1. turn to your neighbor;
2. drill partners;
3. reading buddies;
4. worksheet checkmates;
5. homework checkers;
6. test reviewers;
7. composition pairs;
8. computer groups;
9. writing response groups;
10. group reports.

c. Discussion Alternatives/Small Group Work (*Circle one could use*):

1. group discussion--pool ideas of group.
2. buzz groups--small group of 4-6 followed by disc. in entire group.
3. panel discussion--4-8 member panel informally discusses topic.
4. symposium--disc. in phases by series of experts.
5. debates--pro and con of a controversial issue.
6. concentric circles--inner circle disc and outer listen and then is reversed.
7. reaction sheets--group reacts to predetermined controversial or important ideas.
8. Phillips 66--6 people discuss topic for 6 minutes.
9. role play--act out a situation with group defined roles and then discuss.
10. picture making--4-5 sub-groups make illustrations about major ideas or principles.

Bank (1992)

Table 1

Generic Cooperative Learning Methods

1. **Student Teams-Achievement Divisions (STAD).** Students in grades 2-12 work in heterogeneous four- to five-member groups after being presented with lessons by the teacher. They help one another master the worksheets from that lesson. After that, students take a quiz on the material and team scores are determined based on improvement of all team members over previous scores. Teams with the highest scores are then recognized in a weekly class newsletter (Slavin, 1983a).
2. **Teams-Games-Tournaments (TGT).** The rationale, method, and grade range in TGT is the same as STAD, except that the quizzes are replaced by students competing with classmates from other teams with similar achievement. Students earn points for their team, and teams with high scores receive public recognition (DeVries, Slavin, Fennessey, Edwards, & Lombardo, 1980).
3. **Jigsaw I.** Students work in five- to six-member teams, typically in subjects like social studies and English. Here, students can be divided into discrete areas of expertise and each team member can be given a unique set of information on a topic. After reading the material, the students meet in an "expert group" composed of corresponding experts from the other teams to discuss and master the information. They return to their original groups to teach their teammates this information. Finally, they are individually tested; there are no group grades (Aronson, Blaney, Stephan, Sikes, & Snapp, 1978).
4. **Jigsaw II.** This is an adaptation of Jigsaw I designed by Slavin to correspond more closely with the intergroup competition of his other team methods. Here, students with an individual topic assignment in mind, read a chapter or story that they must teach to their group. Students take quizzes individually, and total team scores are published in a newsletter (Slavin, 1983a).
5. **Learning Together.** This method, which is close to pure cooperative learning, is particularly useful for problem solving tasks. After the teacher has presented a lesson, students work in small heterogeneous groups on a common worksheet. Teachers emphasize positive interdependence (sink or swim together), face to face interaction, and individual accountability. Teams receive praise, tokens and grades, but there is no competition between groups or individuals (Johnson & Johnson, 1987).
6. **Group Investigation.** Developed in Israel, this method is useful in most subject areas at both the elementary and secondary levels. Students work in self-selected two- to six-member groups using inquiry, discussion, cooperative planning, and projects. Groups choose subtopics from a unit being studied by the entire class, break it down into manageable parts for individual tasks, and then carry out the activities necessary for a group presentation (Sharan & Sharan, 1976).
7. **Co-op Co-op.** Though philosophically similar to the Group Investigation method described above, Co-op Co-op contains more structure than Group Investigation by using ten standard implementation steps. In essence, a general topic is divided into subtopics for the groups. The groups break their subtopic into minitopics for each student. The minitopics are presented within each group and then integration is made of all the material for a class presentation. Evaluation is based on team efforts as well as individual papers (Kagan, 1985).

Bank (1991) AERA
 The Emergence of Cooperative Reading:
 Analyzing Components of Successful Programs and Strategies.

Cooperative Learning General Ideas:

a. Intergroup Interaction Salient Features:

1. Face-to-face interaction.
2. Positive Interdependence.
3. Individual Accountability.
4. Training in interpersonal and small group skills.
5. Frequent group processing.

b. Roles:

Reading Roles: reader, materials handler, checker, summarizer, praiser, elab seeker, facilitator.

Writing Roles: executive director, reporter, author, proofreader, co-author, editor.

Computer Roles: keyboarder, recorder, reporter, praiser, checker, summarizer, and encourager.

c. Quick Starters:

1. turn to your neighbor;
2. drill partners;
3. reading buddies;
4. worksheet checkmates;
5. homework checkers;
6. test reviewers;
7. composition pairs;
8. computer groups;
9. writing response groups; and
10. group reports.

d. Method Similarities

- (1) introduction of the strategy;
- (2) explanation of the purpose;
- (3) teacher and peer modeling of the method;
- (4) guided interaction and negotiation of meaning;
- (5) multiple passage readings and encodings;
- (6) presentation of conflicting viewpoints;
- (7) elaboration, dialogue, and summarization;
- (8) diagnosis of misunderstandings;
- (9) internalization and ownership over the strategy;
- (10) teacher and peer feedback and assistance.

e. Method Differences:

- support, goals, ages, group size, roles, interactions, time, text type

f. Teacher Roles:

- guide, assist, dialogue, clarify, feedback, question, push.
- elaborate, summarize, hint, cue, think sheets, think aloud.

Explaining Some Key Principles:

Building Positive Interdependence (common goal: sink or swim together)

(divide task, contingency rewards, one resource)

1. Goals: All have same goal—team mural, essay, model, report.
2. Rewards: Team rec based on all contribs made.
3. Task: Division of labor; mini-topics, need 8 hands.
4. Resources: 1 has scissors, 1 has the paper, glue, marker.
5. Roles: Complement and necessary roles: Materials Handler, Question Commander, Coach, Encourager, Cheerleader, Taskmaster, Recorder, Checker, Gatekeeper.

Building Individual accountability (responsible for own learning)

- a. pick student at random.
- b. everyone certifies correctness.
- c. listen and watch students rehearse.
- d. assign jobs to each student.
- e. students bring completed work to group.
- f. color code individual contributions.
- g. team scores based on individual scores.
- h. have teams reflect on progress and performance.
- i. have students reflect and summarize their participation.
- j. interview others and share what heard from...

Building Social Skills and Trust...(4 F's)

Trust/Group Bonding

1. Where were you born?
2. Favorite hobby, music group, color?
3. Proudest accomplishment?
4. A good movie I've seen is...
5. I wish I had a second chance at...
6. A pet peeve
7. How many brothers and sisters.
8. A career I would like and why
9. An organization/club I belong to...
10. Where I wish I was born and why...

(pets, food, birthday, wishes, lucky #, most boring..., T.V. shows, favorite zoo animal, fav car)

b. 4 F's

Forming: Organize and Establish Groups

Functioning: Manage, Implement, Support, Motivate and Accept

Formulating: Understand, Review, and Learn New Strategies

Fermenting: Disagreement, Controversy, and Alternative Answers

Grouping Strategies (ability, gender, personality, race, reward structure)

1. Kindergarten-Grade 1: student choice, by alphabet, eye color, count off
2. Grades 2-4: color of clothing, by age, by bus, food prefs, kinds of shoes
3. other: by birthdays (group by month), favorite ice cream, # of syllables in name

Keep in Mind:

1. help not equally effective--giving and receiving explanations are beneficial, not terminal help
2. in uneven groups, boys are more successful
3. groups with only high and low ability groups do little explaining
4. extroverts receive more explanations than introverts

Grading:

1. grade performance on tests and quizzes individually
2. give group grades for group processes
3. avoid group grades for group products
4. avoid competition between groups
5. have all group members sign group reports

Reaching Difficult Students (see also Blueprints: p. 73)

1. Keep the group small (2-3 members)
 - a. Have list who want to work with--assign two skillful, popular, caring students to him/her
2. Focus assignment on social skills when don't get along
3. Incorporate student interests into assignment (e.g., sports)
4. Give a role where student can shine (e.g., art/graphics)
5. Strengthen the group goal by offering what individual would like
6. Evaluate individually, but offer bonus points for group mastery
7. Give unmotivated student responsibility (e.g., tutoring)
8. Persist in teaching cooperative skills
 - a. Offer the group points for displaying specific coop behaviors
 - b. Encourage encouragement and "high five's"
9. Begin teacher monitoring with that group
10. Celebrate group success.
11. Move the student from the spotlight.
12. Distract the student with a question.
13. Highlight students behaving appropriately.

COOPERATIVE LEARNING

Theory/Rationale:

1. Encourages high student-teacher interaction
2. Develops cooperation and support among peers
3. Increases feedback and time on task
4. Respects diverse talents and ways of learning
5. Facilitates links to prior knowledge and sharing ideas
6. Enhances perspective-taking
7. Fosters problem-solving conflict management
8. Instills divergent thinking and risk-taking thinking
9. Utilizes resources and division of labor
10. Decreases fear of failure
11. Teacher as mentor and co-learner
12. Social view of knowledge and learning
13. Joint products and ownership

Cooperative Learning Thought Questions to Ponder

- 1. Coop interaction is essential for CL.**
- 2. Group rewards are essential for coop lrng to work.**
- 3. In CL, a test is the best way to hold students accountable for the work.**
- 4. We will learn more from lectures, but remember more from CL.**
- 5. Grp activities & CL are all fun/games.**
- 6. CL is an alternative to ability grpg.**
- 7. Interdependence and common goals are optional for CL.**
- 8. Most people will understand what I mean when I say I am using CL.**
- 9. Heterogeneous grpg is better than homogeneous grpg.**
- 10. The reason I would choose CL is because I am concerned with:
a. social/caring outcomes.
b. skills/knowledge/achieve outcomes.**

TABLE I
Consequences of Controversy, Debate, and Individualistic Learning

Controversy	Debate	Individualistic
Deriving conclusions by categorizing and organizing information and experiences	Deriving conclusions by categorizing and organizing information and experiences	Deriving conclusions by categorizing and organizing information and experiences
Being challenged by opposing views	Being challenged by opposing views	Presence of only one's own view
Uncertainty about correctness of own view	Uncertainty about correctness of own view	Fixation on own view
High active search for more information	Moderate active search for new information	Satisfaction with present information
High active representation of and elaboration on own position and rationale	Moderate active representation of and elaboration on own position and rationale	No representation of and elaboration on own position
Listening to and understanding opposing positions and rationales	Listening to and understanding opposing positions and rationales	Unawareness of opposing positions and rationales
High liking for all students involved	Moderate liking for all students involved	Neutrality toward other students
High liking for subject area and instructional situation	High liking for subject area and instructional situation	Neutrality toward subject area and instructional situation
High self-esteem	Moderate self-esteem	Neutrality toward self
High perceived peer academic support	Moderate perceived peer academic support	Academic neutrality among peers
High attitude and position change	Hardening of own position	Fixation on own position
Incorporation of opponents' information and reasoning	Rejection of opponents' information and reasoning	Fixation on own information and reasoning
Liking for academic arguments	Liking for academic arguments	Disliking of academic arguments
Verbalizations directed toward peers	Verbalizations directed toward peers	Verbalization directed toward teacher

Figure 1

*Cooperative and Traditional Learning Groups
What Is the Difference?*

Cooperative Learning Groups	Traditional Learning Groups
Positive interdependence	No interdependence
Individual accountability	No individual accountability
Heterogeneous	Homogeneous
Shared leadership	One appointed leader
Shared responsibility for each other	Responsibility only for self
Task and maintenance emphasized	Only task emphasized
Social skills directly taught	Social skills assumed and ignored
Teacher observes and intervenes	Teacher ignores group functioning
Groups process their effectiveness	No group processing

David W. Johnson & Roger Johnson (1985)
AERT 2012 Classroom conflict: Controversy versus Debate
page 405

Cooperative Learning may be used to supplement other teaching methods. It involves students in small-group learning activities that promote positive interaction resulting in improved learning.

What Is Cooperative Learning?

- Mixed groups. The teacher groups students of different backgrounds, academic achievement levels, and social skills to work together.
- Contributions from all group members. The teacher structures the work so that each member must contribute to successfully meet the group goal.
- Individual responsibility. Students are accountable for their own learning. Teachers use observations, tests, and individual assignments to measure each student's achievement.
- Group responsibility. Individual students are also accountable for working cooperatively to accomplish the group task. Groups that work well together may receive a reward.
- Social skills. To learn effectively, all students need skills—relating, interacting, and communicating with others. By working cooperatively, they can enhance the social skills they have and acquire the new ones they need.
- Opportunity for success. Cooperative learning offers every student the opportunity for success. Research shows that students become more successful when this method is used.

What Are Some Benefits?

Cooperative Learning, when properly implemented, has positive effects on:

- Psychological well-being. Cooperative Learning helps to meet five basic needs all people share: survival, acceptance, power, freedom, and fun.
- Academic achievement. High-achieving, low-achieving, special education, and at-risk students benefit academically from Cooperative Learning.
- Attitudes. As students become more proficient in social skills, they develop more positive attitudes toward self, peers, adults, and learning in general.
- Productivity. When teachers use cooperative strategies to build a positive classroom environment, student productivity increases and discipline problems typically decrease.
- Motivation. Teachers find an increase in student motivation to learn. Most students welcome the chance to work and share with peers.

How Does It Work?

- Grouping. Teachers divide the class into groups of two to six; each has students of differing backgrounds, achievement levels, and social skills.
- Task assignment. The teacher determines which content, skills, tasks, and objectives are appropriate for the groups. A variety of approaches are available for different assignments.

- Change. Cooperative Learning causes changes in room arrangement and noise level. Informal and heightened student activity may be mistaken for nonproductivity. But students are usually productively involved and teachers are in control of learning when this method is appropriately used.
- Practice. Cooperative Learning is especially appropriate for practicing the learning of content and skills. It motivates students to work on repetitive tasks needed to master a subject.
- Thinking skills. In Cooperative Learning groups, student creativity and problem-solving skills can be enhanced. Two heads may be better than one.
- Monitoring. The teacher plays an active role monitoring and supervising student groups, helping them function and complete the assignment.
- Evaluating. Individual student progress is measured by individual tests. Group progress is measured by group success in accomplishing the group's goal.

What Are Some Examples?

In an *early childhood classroom*, the teacher gives pairs of students equal numbers of small plastic bears. One partner counts as the other listens to make sure the counting is accurate. Then the teacher has students change jobs. Finally, the teacher checks to be sure each pair got the correct total. Pairs who did not recount. When all are correct, they receive small bear-shaped cookies as a reward.

In an elementary classroom, groups of three and four design containers to be "launched into space." Each container will hold a raw egg that must be protected from the impact of landing. The teacher may assign specific jobs to assure that each student contributes and agrees on project ideas. When the activity is completed, the teacher and students test their products. Each group determines the success of "reentry" of its space vehicle and revises it as needed.

In a middle school classroom, three to four students work cooperatively on a map identification activity. Small cards are made with small sections of cutouts from a map of the United States. Cutouts contain highways, rivers, borders, or other clues so students can identify the state. In each group, students have various roles. Helpers obtain and return cards to a file. Verifiers double-check the map cutout location and state spelling. Writers correctly write the state name on a response sheet. Praisers make positive comments about each student's work.

In a high school foreign language class, three or four students are grouped in teams. After initial instruction by the teacher, students study worksheets and practice vocabulary with their teams. After several practice sessions, each student takes an individual test covering the content. Previous test scores are compared and each student is given an improvement score. Student teams are recognized on the basis of the improvement scores of each team member.

How Can Parents Help?

- Avoid comparisons of students. Encourage students to develop their own talents and strengths.
- Deemphasize grades. Grades are not the best measure of your child's progress.
- Encourage appreciation and respect for others. Students need to learn to relate to others who may be different from themselves.
- Promote cooperation at home. Work and play together, avoiding unnecessary competition between family members.
- Cooperate with the teacher by supporting new methods that are proven to be effective.

Our changing world requires that people interact and work together harmoniously. Our future depends on our ability to cooperate locally, nationally, and internationally.

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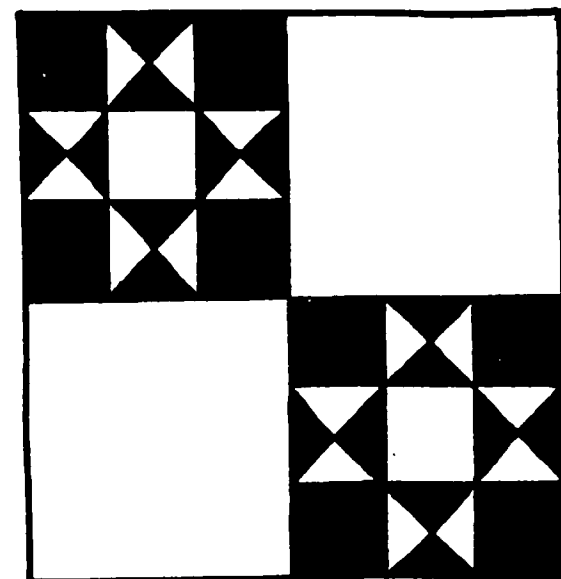
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Cooperative Learning:

What You Need to Know

by Harvey C. Foyle
and Lawrence Lyman



National Education Association
Washington, D.C. 20036-3290

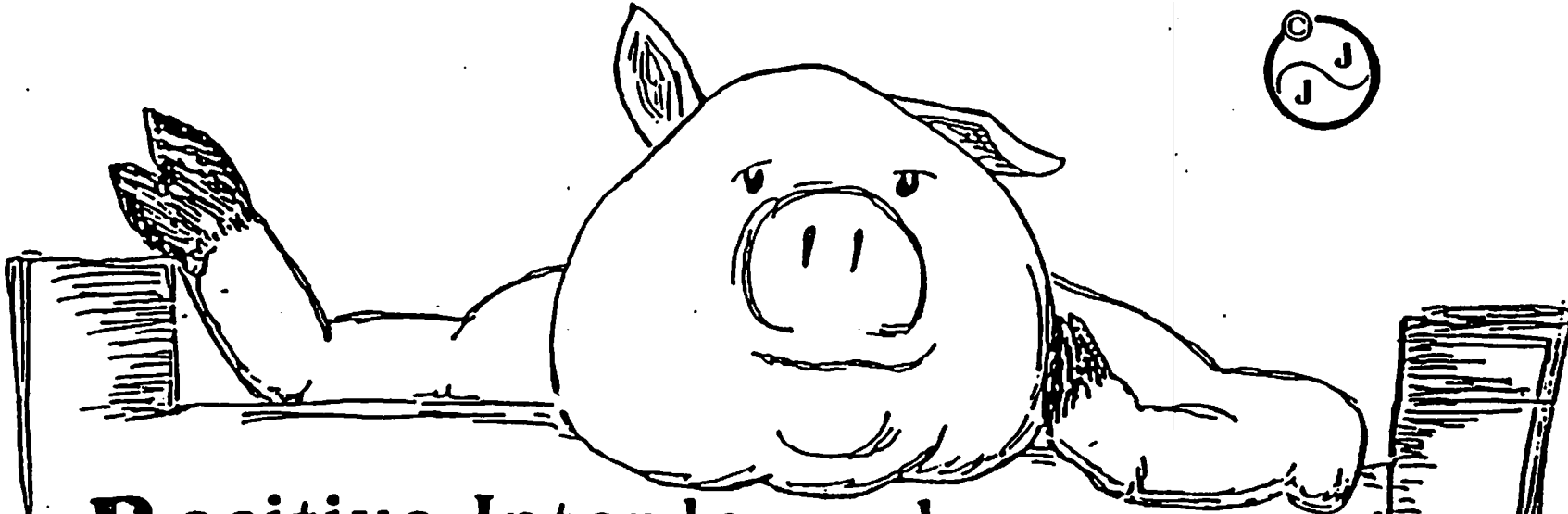
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The Differences Between Traditional Group Learning and Cooperative Learning

There are a number of differences between the typical use of classroom learning groups and cooperative learning groups. These differences (summarized in Figure 1) are:

1. Cooperative learning groups are based on *positive interdependence* among group members, where goals are structured so that students need to be concerned about performance of *all* group members as well as their own.
2. In cooperative learning groups, there is a clear *individual accountability* where every student's mastery of the assigned material is assessed, each student is given feedback on his or her progress, and the group is given feedback on how each member is progressing so that the other groups' members know who to help and encourage. In traditional learning groups, individual students are not often held individually accountable for providing their share of the group's work and, occasionally, students will "hitchhike" on the work of others.
3. In cooperative learning groups, the membership is typically heterogeneous in ability and personal characteristics, while traditional learning groups are often homogeneous in membership.
4. In cooperative learning groups, all members share responsibility for performing leadership actions in the group. In traditional learning groups, a leader is often appointed and put in charge of the group.
5. In cooperative learning groups, responsibility for each other's learning is shared. Group members are expected to provide help and encouragement to each other in order to ensure that all members do the assigned work. In traditional learning groups, members are seldom held responsible for each other's learning.
6. In cooperative learning groups, the goals focus on bringing each member's learning to the maximum *and* on maintaining good working relationships among members. In traditional classroom learning groups, students most often focus only on completing the assignment.
7. In cooperative learning groups, the social skills students need in order to work collaboratively (such as leadership, ability to communicate, to trust one another, and to manage conflict) are directly taught. In traditional classroom learning groups, interpersonal and small-group skills are assumed—most often mistakenly.

8. When cooperative learning groups are used, the teacher observes the groups, analyzes the problems they have working together, and gives feedback to each group on how well they are managing the group task. Teacher observation and intervention seldom take place in traditional learning groups.
9. In cooperative learning, the teacher structures procedures for groups to "process" how effectively they are working, while no attention is given, in traditional group learning situations, to the way the group is working—or not working.



Positive Interdependence

Individual Accountability

Group Processing

Social Skills

FACE-to-Face Interaction

page 409

◀ BASIC ELEMENTS OF COOPERATIVE LEARNING ▶

▷ Positive Interdependence

Students must feel that they need each other in order to complete the group's task, that they sink or swim together. Some ways to create this feeling are through establishing mutual goals (students must learn the material and make certain group members learn the material), joint rewards (if all group members achieve above a certain percentage on the test, each will receive bonus points), shared materials and information (one paper for each group or each member receives only part of the information needed to do the assignment), and assigned roles (summarizer, encourager of participation, elaborator).

▷ Face-To-Face Interaction

No magic exists in positive interdependence in and of itself. Beneficial educational outcomes are due to the interaction patterns and verbal exchanges that take place among students in carefully structured cooperative learning groups. Oral summarizing, giving and receiving explanations, and elaborating (relating what is being learned to previous learning) are important types of verbal interchanges.

▷ Individual Accountability

Cooperative learning groups are not successful until every member has learned the material or has helped with and understood the assignment. Thus, it is important to frequently stress and assess individual learning so that group members can appropriately support and help each other. Some ways of structuring individual accountability are by giving each group member an individual exam or by randomly selecting one member to give an answer for the entire group.

▷ Interpersonal and Small Group Skills

Students do not come to school with the social skills they need to collaborate effectively with others. So teachers need to teach the appropriate communication, leadership, trust, decision making, and conflict management skills to students and provide the motivation to use these skills in order for groups to function effectively.

▷ Group Processing

Processing means giving students the time and procedures to analyze how well their groups are functioning and how well they are using the necessary social skills. This processing helps all group members achieve while maintaining effective working relationships among members. Feedback from the teacher and/or student observers on how well they observed the groups working may help processing effectiveness.

Taken from:

Circles of Learning: Cooperation in the Classroom (Revised edition).
D. W. Johnson, R. T. Johnson and Edythe Johnson Holubec, Edina,
MN: Interaction Book Company, 1986.

Cooperative Learning: On the Farm

a. Basic Principles (PIGS Face)

b. HOG FARMER:

Have your Objectives; Group size, F (4F's), Assigning students, Room arrangements, Materials, Ensuring interdependence, Roles.

c. Value Line; in my area of teaching, I would find (p. 155)

Low Medium High

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1-2-3-4-5-6-7-8-9-10

1. Face-to-face interaction important

2. Positive interdependence important

3. Individual accountability important

4. Grouping strategies

5. Assigning member roles

6. Interpersonal skills

7. Trust

8. Tchr/manager observations

9. Group processing

Cooperative Learning Components:

(Bonk, 1994)

Climate
Peer support
Active involvement
Task/assignment
Content
Time of task
Tutoring
Communication
1:1 interaction
Fairness
Self-esteem and self-concept
Receiving explanations
Equal status
Immediate feedback
Rewards
Positive interdependence
Individual accountability
Encouragement
Self-regulation
Higher order thinking skills
Lower order thinking skills
Division of labor
Heterogeneous grouping
Giving explanations
Receiving explanations
Content talk
Praise and encouragement
Helping behaviors
Attitudes
Constraints (curric/\$/grade/students/teachers/district)
Structure (STAD, Jigsaw, TGT, TAI, etc.)
Self-selection and autonomy
Student responsibility
Group processing
Social skills
Goals
Control in the classroom
Modeling and fading
Social plane
Individual plane
Respect
Cognitive skills--explain, search, review, compare

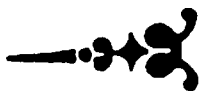
Cooperative Matching:

- a. Group Investigation**
- b. Homogeneous Grouping**
- c. Face-to-Face Interaction**
- d. Sequential Structure**
- e. Status Ordering**
- f. Random Grouping**
- g. Simultaneous Structure**
- h. Peer Status Ordering**
- i. STAD**
- j. Heterogeneous Grouping**
- k. Learning Together**
- l. Free rider effect**
- m. Roundrobin**
- n. Individual Accountability**
- o. Academic Status Ordering**
- p. Rich-get-richer effect**
- q. Positive Interdependence**

- ___ 1. when small groups develop a hierarchy on some status characteristic (e.g., race, social class, gender, reading ability, or attractiveness) wherein some members are more active than others with an agreed-upon social ranking where everyone feels that it is better to have a high rank than a low rank.
- ___ 2. method developed by Aronson and his colleagues to promote interdependence among students by giving each student access to a portion of the lesson information.
- ___ 3. when higher-ability students take over leadership roles of the group in ways that benefit them cognitively or socially.
- ___ 4. when students create their own status orders based on things like athletic competence, attractiveness, and popularity.
- ___ 5. has an essential component of competition among groups.
- ___ 6. when the teacher calls on one student at a time.
- ___ 7. method originally developed to enhance student social skills and meet their emotional needs.
- ___ 8. when less able or interested students allow the higher-ability students to do most or all of the work.
- ___ 9. placing each of one's classmates in a rank order of competence in such areas as math and science.
- ___ 10. when one perceives that one is linked with others in a way so that he/she will not succeed unless they do.
- ___ 11. picking out students at random or assigning jobs to each student or having students summarize their participation are three examples of this.
- ___ 12. cooperative learning or grouping arrangement which is quick and easy and fun but often can create intense conflicts, teams of one gender or race, and/or limited opportunities to learn.

Structured Controversy Task (pp. 198-199)

- a. Group by car you drive.
- b. You will be assigned to one of four groups. Please be prepared to make 3-4 arguments for the position you have been given using your text, lecture, and video info as resources (be sure to name your group).
- Grp 1
 - a. I think cooperative learning is here to stay and teaches important skills (B&F pp. 241-242)
 - b. I think cooperative learning is a fad and we need to stick to the basics.
- Grp 2
 - a. In cooperative learning one should use group grades (B&F, pp. 231-232)
Raise the group average, raise individual scores based on improvement, increase individual mastery with team assistance, give a bonus for cooperative skills.
 - b. In cooperative learning one should have individual grades (B&F, pp. 230-231)
- Grp 3
 - a. In cooperative learning one should have no grades (B&F, p. 232-233)
Tight Checker, Traveler, Trust activities, Review social skills, Random oral quizzes, Post-Activity quiz, Write a summary paper, Sign on the Line, Explain to a neighbor, Get all to sign: "I made my best contribution. _____", Hold a tournament, Group evaluator Checklist/Feedback/Sharing, Complete related homework, Test, Evaluate a neighbor, Roundrobin answers, Share group projects, Explain others' answers, Jigsaw, Indiv Apply, Make log entries, Tchr Observes, Make a team ad.
 - b. In cooperative learning one should grade cooperative processes (B&F, p. 230)
Grade based on using social skills desired, grade contributions helpful to the group, give bonus points for displayed social skills, do not punish or lower grades for poor use of social skills.
- c. Fill out p. 199
- d. Switch sides and continue debate
- e. Come to some consensus.
- f. See Blueprints p. 139: What to do when you disagree (argue, persuade, vote, compromise, mediate, arbitrate, delay, reconceptualize, negotiate, give in, seek consensus, humor, avoid)



DEFINITIONS



• **COOPERATION:**

We sink or swim together.

I can attain my goal only if you attain your goal; there is a positive correlation among goal attainments.

Conditions:

- small, often heterogeneous groups
- other students as a major resource
- teacher acts as a consultant
- positive interdependence between group members
- individual accountability--all members know the material
- evaluate by comparison to a preset criterion

• **INDIVIDUALIZATION:**

We are each in this alone.

My achieving my goal is unrelated to your achieving your goal; there is no correlation among goal attainments.

Conditions:

- separate working area
- separate work materials
- teacher is the primary source
- self-paced
- evaluate by a preset criterion

• **COMPETITION:**

I swim, you sink; I sink, you swim.

If I obtain my goal, you cannot obtain your goal and vice versa; there is a negative correlation among goal attainments.

Conditions:

- small, homogeneous groups
- maximize the number of winners
- compete against people at the same ability level
- not a "life or death" situation, but for fun and review, and a change of pace
- evaluate by comparison to other's work

STRATEGIES FOR GROUPING

Kindergarten - Grade 1

Partners

Count off - hold up that number of fingers

Student choice

Matching pictures

By alphabet (letters similar)

Drawing

Favorite T.V. program

Beginning alphabet/end alphabet (names)

Eye color

Grades 2, 3, 4

Teacher assigned

Shape cards

By color of clothing

Line up by height and count-off

Birthdays - group by month

Attributes that are different

By bus

Drawing chips

By age (continuous progress)

Ability group

Preferences of food, etc.

Number of syllables in name

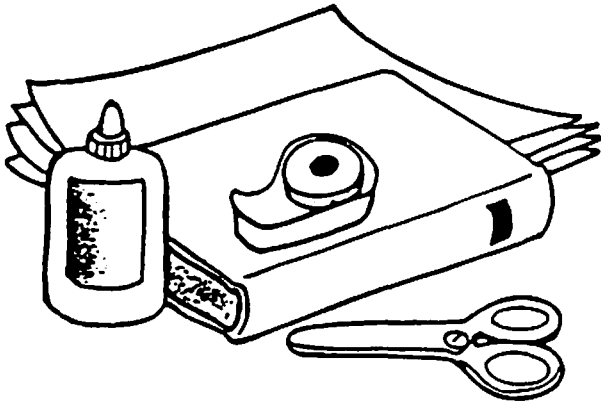
Kinds of shoe

Heterogenous and homogenous groups

Tongue depressor sticks

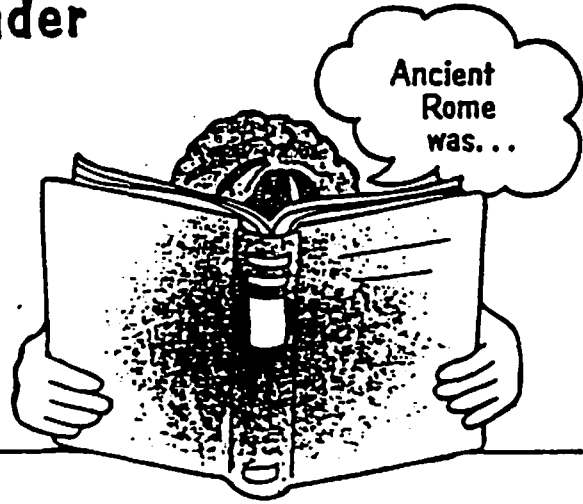
Favorite ice cream

Materials Manager



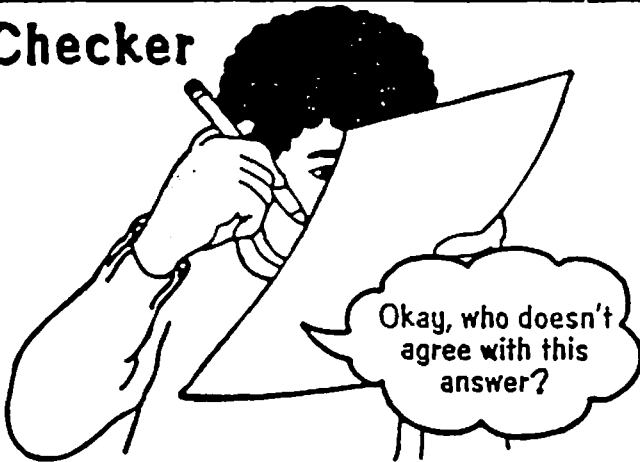
Gather all research books and other supplies.

Reader



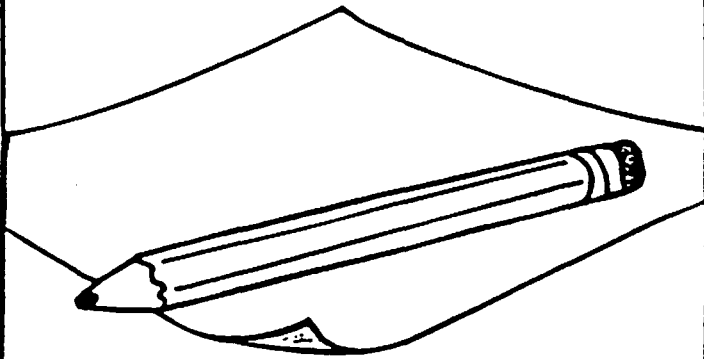
Read information from resources aloud to the group. Check to be sure everyone is listening.

Checker



Check to be sure that all members agree on your group's answer or information selected for a project. Make sure that each member can explain the answer or information and tell why it was selected.

Recorder



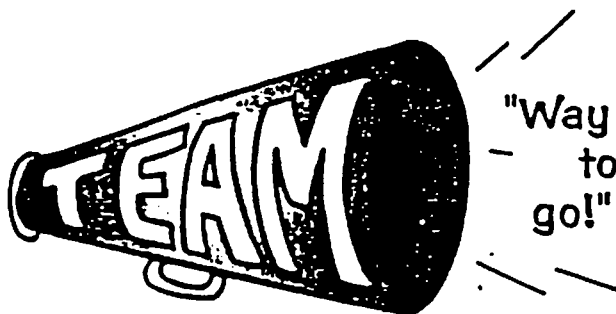
Fill out any forms. Write information as group members dictate.

Coach

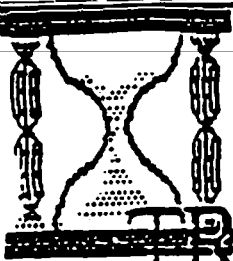


Check to be sure that everyone agrees on the instructions, asking for help if there's a disagreement. See that all members have an equal chance to participate and don't waste time.

Encourager



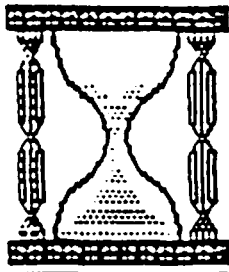
Give lots of praise and encouragement to members as your group works.



TRACKER

Keeps track of time.

Keeps group on task.



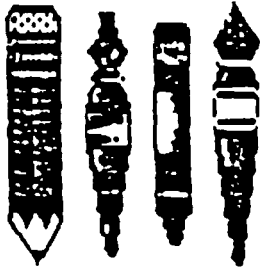
PRAISER

Praises members for their contributions.

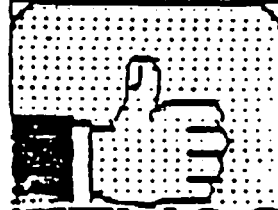
Shows acceptance and strong group support.



WRITER

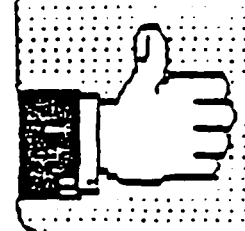


WRITES FOR THE GROUP



ENCOURAGER

Encourages in a positive manner each member's participation.



Role Controversy (personality example)

(Bonk, December, 2002)

Ground Rules:

- 1. Try the role play. If you do not like the role assigned, pick a different one. At last resort, just be yourself.**
- 2. If none of that works or if you have a creative name or personality not on the list, you can also give me more names to put into the list of names.**
- 3. Choose a name which no one has chosen so as to avoid confusion.**
- 4. Please debate, critique, contend, or attack ideas not just personalities.**
- 5. Respond based on the content of what you read for the week or semester, not just what that person may be known for.**
- 6. If you have hesitations for how your comments will be taken, feel free to end your comment with a note on what your role was if you think that is important to know.**
- 7. You do not have to tell your peers who you were during online role play. Students are asked not to try to coerce or gang up on someone to have them tell you who they are.**
- 8. Enjoy the role play. We can debrief later.**

Possible Roles (Password/Username and real name):

- 1. reporter (Connie Chong)**
- 1. commentator (Peter Jennings)**
- 1. anchor (Dan Rather)**
- 1. interviewer (Barbara Walters)**
- 2. refiner (Michael Jordan)**
- 2. perfecter (Ludwig van Beethoven)**
- 2. editor (Editor of the New York Times)**
- 3. leader (Margaret Thatcher)**
- 3. ceo (George Bush)**
- 3. controller (Bill Gates)**
- 3. queen (Cleopatra)**
- 4. connector (Alvin Toffler)**
- 4. synthesizer (Al Gore)**
- 5. judge (Sandra Day O'Conner)**
- 5. decider (John Ashcroft)**
- 6. devil (Devil's Advocate)**
- 6. critic (Roger Ebert)**
- 7. thinker (Aristotle)**

- 7. observer (Jane Goodhall)**
- 7. speculator (Anna Freud)**
- 7. scientist (Dian Fossey)**
- 7. mirror watcher (Norwegian Reflective Observational Society)**
- 8. conqueror (Napolean Bonaparte)**
- 8. bloodletter (Attila the Hun)**
- 8. checkmate (Bobby Fischer)**
- 8. ruler (King Arthur)**
- 9. squelcher (Joseph Stalin)**
- 9. biased (Rish Limbaugh)**
- 10. slacker (J. D. Slacker)**
- 10. surfer (Mr. (Surfer Dude) Spicoli)**
- 11. muse (Plato)**
- 11. artistic (Paul McCartney)**
- 12. predictor (Peter Drucker)**
- 12. guesser (Fortune Teller)**
- 13. founder (Maria Montessori)**
- 13. organizer (Elizabeth Dole)**
- 14. questioner (Q on Star Trek, The Next Generation)**
- 14. protester (Bob Dylan)**
- 15. sensitive (Madonna)**
- 15. emotional (Admiral James T. Kirk on Star Trek)**
- 16. adventurer (Sir Edmund Hillary)**
- 16. traveler (Amelia Earhart)**
- 17. mediator (Counselor Troy on Star Trek, The Next Generation)**
- 17. peacemaker (Colin Powell)**
- 18. watchdog (Alan Greenspan)**
- 18. measurer (Professor Milton Friedman)**
- 19. inventor (Thomas Edison)**
- 19. brainstormer (Mr. Dean Kamen, Inventor and Brainstormer)**
- 19. creative (Marie Curie)**
- 20. optimist (Abraham Maslow (be all the you can be!))**
- 20. idealist (Former Polish President Lech Walesa)**
- 21. robotic (Mr. Spock)**
- 21. information (Data on Star Trek, The Next Generation)**
- 22. aimless (The Absent-Minded Professor)**
- 22. dumb (Harry (Jeff Daniels in the Dumb and Dumber Movie))**
- 22. dumber (Lloyd (Jim Carrey in the Dumb and Dumber Movie))**
- 23. coach (Bob Knight)**
- 23. inspirator (Vince Lombardi)**

- 24. mentor (Girl Scout Leader)**
- 24. guide (Boy Scout Leader)**
- 25. humanitarian (Mother Theresa)**
- 25. do-gooder (Jimmy Carter)**
- 26. funny (Robin Williams)**
- 26. comic (Lucille Ball)**
- 26. witty (David Letterman)**
- 27. advisor (Dear Abbey)**
- 27. tutor (Socrates)**
- 28. sage (Gandhi)**
- 28. wiseperson (Confucious)**

Others:

- human (Human Being)**
- person (I. M. A. Person)**
- roleplay (Role Play)**
- unknown (The Unknown Soldier)**

Role Play Explanation (Bonk, 2001)

Everyone is being given a different e-mail message that is instructing him or her how to act during this activity. Please keep your role a secret until the end of the session.

However, yours says:

1. Your job for this week is that of Reporter/Summarizer/Reviewer/Commentator:

As a result, you can only summarize across, review, or comment on points made when addressing this problem.

2. Your job for this week is that of Editor/Refiner/Perfecter/Improver

As a result, you can only edit, refine, perfect, improve points made when addressing this problem.

3. Your job for this week is that of Controller/Executive Director/CEO/Leader

As a result, you can only oversee the process, report overall findings and opinions, try to control the flow when addressing this problem.

4. Your job for this week is that of Connector/Relator/Linker/Synthesizer

As a result, you can only connect together, interrelate, and link ideas made when addressing this problem.

5. Your job for this week is that of Decider/Judge/Settler

As a result, you can only make decisions, evaluate, settle, and judge ideas when addressing this problem.

6. Your job for this week is that of Devil's Advocate/Critic/Censor

As a result, you can only take opposite points of view for the sake of an argument and be an antagonist when addressing this problem.

7. Your job for this week is that of Reflector/Thinker/Speculator/Observer/Watcher

As a result, you can only observe, watch, reflect, think meditate, and speculate on the discussion when addressing this problem.

8. Your job for this week is that of Warrior/Debater/Arguer/Conqueror/Bloodletter

As a result, you can only take your ideas into action, debate with others, persist in your arguments and never surrender or compromise nomatter what the casualties are when addressing this problem.

9. Your job for this week is that of Idea Squelcher/Biased/Preconceiver

As a result, you can only squelch good and bad ideas of others and submit your own prejudiced/biased ideas when addressing this problem.

10. Your job for this week is that of Slacker/Slough/Slug/Surfer Dude

As a result, you can only sit back quietly and listen, make others do all the work for you, and generally have a laid back attitude (i.e., go to the beach) when addressing this problem.

11. Your job for this week is that of Artist/Idea Person/Visionary/Muse

As a result, you can only create, draw, and present proposals, alternatives, provocations, and new ideas when addressing this problem.

12. Your job for this week is that of Planner/Predictor/Guesser/Flowcharter

As a result, you can only think ahead of the rest in a rational, logical, and structured way and then plan, predict, and guess where we should head or what we should do next when addressing this problem.

13. Your job for this week is that of Organizer/Starter/Founder/Initiator

As a result, you can only initiate and organize large scale change, flowchart possible growth patterns, and generate new ways for doing things when addressing this problem.

14. Your job for this week is that of Questioner/Ponderer/Protester

As a result, you can only question, ponder, and protest the ideas of others and the problem presented itself (i.e., since you are a radical, ultra-liberal individual) when addressing this problem.

15. Your job for this week is that of Emotional/Sensitive/Intuitive

As a result, you can only be the fire and warmth of emotions, feelings, hunches, and intuitions when addressing this problem.

16. Your job for this week is that of **Adventurer/Discoverer/Explorer/Traveler**

As a result, you can only **suggest areas of new discovery, exploration, and uncharted territories** when addressing this problem.

17. Your job for this week is that of **Mediator/Negotiator/Compromiser/Peacemaker**

As a result, you can only **mediate, negotiate, compromise, and create the peace between warring/arguing parties** when addressing this problem.

18. Your job for this week is that of **Watchdog/Evaluator/Measurer**

As a result, you can only **point out bad, dangerous, and stupid ideas with your very conservative but truthful facts (i.e., you keep everybody honest; especially the radical, ultra-liberal protestor types)** when addressing this problem.

19. Your job for this week is that of **Creative Energy/Inventor/Generator/Brainstormer**

As a result, you can only **bring energy to the conversations and generate lots of fresh ideas and new perspectives to the conference** when addressing this problem.

20. Your job for this week is that of **Optimist/Open-minded/Idealist**

As a result, you can only **note what appear to be feasible, profitable, ideal, and "sunny" ideas** when addressing this problem.

21. Your job for this week is that of **Robotic/Information Dumper/Spock-like**

As a result, you can only **focus on the information provided, the facts, and the logic of ideas made** when addressing this problem.

22. Your job for this week is that of **Absent Minded/Stumpler/Dense/Aimless**

As a result, you can only **stumble and bumble your way through the material but occasionally with some pretty heady, insightful, and esoteric comments** when addressing this problem.

23. Your job for this week is that of **Coach/Facilitator/Inspirator/Trainer**

As a result, you can only **provide hints, clues, supports, and highly motivational speeches to get everyone fired-up or at least one lost individual back on track** when addressing this problem.

24. Your job for this week is that of Guide/Mentor/Teacher/Scaffolder

As a result, you can only provide prompts, hints, cues, recommendations, suggestions, and encouragement that lead or scaffold the learners to new heights (most of the time without their awareness) when addressing this problem.

25. Your job for this week is that of Humanitarian/Do Gooder/Fund Raiser

As a result, you can only go out of your way to lend insight into what is fair and equitable for all, lend a hand in helping someone understand, and do whatever it takes to help someone learn and grow if he or she is confused when addressing this problem.

26. Your job for this week is that of Funny/Humorous/Comic/Witty

As a result, you can only provide quips of humor and add laughter to lighten up the discussion/mood (you might act out in class, but this is expected of you) when addressing this problem.

27. Your job for this week is that of Advisor/Responder/Helper/Tutor

As a result, you can only provide counsel, guidance, suggestion, or recommendations (basically, you assist in the learning process); you cannot solve the problem for them, however, when addressing this problem.

28. Your job for this week is that of Worldly/Wiseperson/Sage/Guru/Spiritual Leader

As a result, you can only provide quotes, sayings, encouragement, paradoxes, and bits of wisdom that display cunning, sagacity, and shrewd insight (you cannot solve the problem for them, however) when addressing this problem.

Role Controversy

Possible Roles (see e-mail message for role):

1. Reporter/Summarizer/Reviewer/Commentator (e.g., Jane Pauley, Connie Chung, Dan Rather, Barbara Walters, Peter Jennings, Tom Brokaw, Walter Cronkite)
2. Editor/Refiner/Perfecter/Improver (e.g., Beethoven, Paul McCartney, Edgar Allen Poe, Michael Jordan, Peggy Fleming, The Editor of the New York Times)
3. Controller/Executive Director/CEO/Leader (e.g., Margaret Thatcher, George Bush, Bill Clinton, Bill Gates, JFK, Queen Elizabeth, Hirohito, Cleopatra, Winston Churchill, Thomas Watson IBM Founder)
4. Connector/Relator/Linker/Synthesizer (e.g., Alvin Toffler, Steven Jay Gould, John Naisbitt, Al Gore)
5. Decider/Judge/Settler (e.g., John Ashcroft, Janet Reno, Lance Ito, Sandra Day O'Conner, Warren Burger)
6. Devil's Advocate/Critic/Censor (e.g., Sisko & Ebert, Former Senator Bill Proxmire & his Golden Fleece Awards)
7. Reflector/Thinker/Speculator/Observer/Watcher (e.g., Dian Fossey, Jane Goodhall, Anna Freud, Jean Piaget, Abraham Lincoln, Aristotle)
8. Warrior/Debater/Arguer/Conqueror/Bloodletter (e.g., Attila the Hun, Alexander the Great, Napoleon, King Arthur)
9. Idea Squelcher/Biased/Preconceiver (e.g., Rush Limbaugh, Joseph Stalin, Adolph Hitler)
10. Slacker/Slough/Slug/Surfer Dude (e.g., Mr. Spicoli on "Fast Times at Ridgemont High," Weekly guests on Baywatch)
11. Artist/Idea Person/Visionary/Muse (e.g., Plato, Leonardo da Vinci, Steve Jobs and Wozniak from Apple Computer, Frank Lloyd Wright, Carl Jung, Aesop, Yoko Ono)
12. Planner/Predictor/Guesser/Flowcharter (e.g., Leon Panetta in charge of the U.S. budget projections, Peter Drucker)
13. Organizer/Starter/Founder/Initiator (e.g., Donna Shalala, Jimmy Hoffa, Elizabeth Dole, Maria Montessori)
14. Questioner/Ponderer/Protester (e.g., Q on Star Trek, Bob Dylan, Arlo Guthrie, Sitting Bull)
15. Emotional/Sensitive/Intuitive (e.g., Jim Kirk on Star Trek, Diana Ross, Madonna)
16. Adventurer/Discoverer/Explorer/Traveler (Christopher Columbus, Jacques Cousteau, Amelia Earhart, Sir Edmund Hillary, Richard Leakey)
17. Mediator/Negotiator/Compromiser/Peacemaker (Counselor Troy on Star Trek; Henry Kissinger, Mikhail Gorbachev, Colin Powell)
18. Watchdog/Evaluator/Measurer (e.g., Alan Greenspan (Fed Reserve); Professor Milton Friedman)
19. Creative Energy/Inventor/Generator/Brainstormer (e.g., Nolan Bushnell, Marie Curie, Ernest Hemingway, Doc on "Back to the Future", Thomas Edison, Alexander Graham Bell, Albert Einstein)
20. Optimist/Open-Minded/Idealist (Former Poland Pres Lech Walesa, Abraham Maslow, Carl Rogers)
21. Robotic/Information Dumper/Spock-like (e.g., Data on Star Trek, Mr. Spock, Robocop)
22. Absent Minded/Stumpler/Dense/Aimless (e.g., Fred MacMurray as the "Absent Minded Professor," Dumb and Dumber, the State Legislature)
23. Coach/Facilitator/Inspirator/Trainer (e.g., Bob Knight, Don Shula, Vince Lombardi, Knute Rockne, Lou Holtz)
24. Mentor/Guide/Teacher/Scaffolder (Big Brothers/Sisters, Boy Scout Leader, Teacher of the Year)
25. Humanitarian/Do Gooder/Fund Raiser (Mother Theresa, Roberto Clemente, Jimmy Carter and Habitat for Humanity, Jerry Lewis, Robin Hood, Eleanor Roosevelt)
26. Funny/Humorous/Comic/Witty (e.g., John Candy, Lucille Ball, the Marx Brothers, the 3 Stooges, Robin Williams, David Letterman, George Burns, Bud Abbott and Lou Costello)
27. Advisor/Responder/Helper/Tutor (e.g., Dear Abbey, Socrates, Mr. Keating on Dead Poets Society)
28. Worldly/Wiseperson/Sage/Guru/Spiritual Leader (e.g., Gandhi, Confucious, Martin Luther King)

CLASSROOM APPLICATION: PREPARING STUDENTS FOR COOPERATIVE LEARNING

The success of cooperative learning depends a great deal on the ability of students to interact appropriately in group settings. Johnson et al. (1984) identify a number of interpersonal skills necessary for success in cooperative settings.

Forming

Forming skills are needed for organizing the group and for establishing minimum norms of appropriate behavior. Such skills include being able to move into and out of groups with a minimum of noise and disruption, working quietly and actively while in the group (i.e., staying on-task), encouraging everyone to participate, and interacting with group members in a courteous way. One of the most important behaviors that teachers need to stress is that put-downs are not a part of effective group functioning.

Functioning

Functioning skills are the second level of cooperative skills. They involve the managing and implementation of the group's efforts to accomplish tasks and to maintain effective working relationships among members. Such skills include expressing support and acceptance for the contributions of group members, knowing when and how to ask for help or clarification about what is being said or done, offering to explain or clarify another student's position, and motivating the group with new ideas or suggestions when enthusiasm wanes.

Formulating

Formulating skills are directed at helping students to understand and remember the material being studied in the group. Such skills include encouraging group members to summarize aloud what was covered, adding important information when something is left out of the summary, reviewing important information, and using learning strategies to remember important ideas.

Fermenting

Fermenting skills are used to stimulate academic controversy so that students will rethink and challenge one another's positions, ideas, and reasoning. Examples of such skills include knowing how to criticize ideas but not people, knowing how to formulate a coherent and defensible position on an issue, and knowing how to probe for and elicit information for arriving at answers and solutions to problems. The major concern at this level is to teach the group members not to stop an investigation when the first solution to a group is presented. Sometimes the first answer or the quickest solution is not the best one. Students need to learn how to stimulate the thinking and intellectual curiosity of group members.

In review, students need to be taught *forming* skills to maintain good classroom management and to ensure that group members develop a positive attitude toward work in the group. The *functioning* skills help the students to interact effectively in the group. *Formulating* skills ensure that the highest quality thinking and decision making are made in the group. Finally, *fermenting* skills, which often are the most difficult to teach, ensure that students learn how to deal with controversy and deal openly with intellectual disagreements.

To teach these skills, Johnson et al. (1984; quoted material from p. 49) suggest the following five steps:

Myron H. Dembo (1991)
Educational Psychology in the Classroom
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SKILLS CHECKLIST

Check the skills your students can do.
Star the skills you are currently teaching.
Put an arrow by the skill you will choose to teach next.

Forming Skills

Move Into Groups Quietly
Stay With the Group
Use Quiet Voices
Take Turns
Keep Hands and Feet to Self
Look at the Group's Paper
Use Member's Names
Look at the Speaker
Use No "Put-downs"

Functioning Skills

Share Ideas and Opinions
Ask for Facts and Reasoning
Give Direction to the Group's Work
Encourage Everyone to Participate
Ask for Help or Clarification
Express Support and Acceptance
Offer to Explain or Clarify
Paraphrase
Energize the Group
Describe Feelings

Formulating Skills

Summarize Out Loud
Seek Accuracy
Seek Elaboration
Help the Group Remember
Check for Understanding
Ask for Others to Plan Out Loud

Fermenting Skills

Criticize Ideas Without Criticizing People
Differentiate Ideas and Reasoning of Group Members
Integrate Ideas into Single Positions
Ask for Justification
Extend Answers
Probe by Asking Indepth Questions
Generate Further Answers
Test Reality by Checking the Group's Work

Social Skill Behaviors

I. FORMING

Staying with the group

Using quiet voices

Encouraging everyone to participate

Taking turns

Using first names

Keeping hands (and feet) to self

Looking at the speaker

No put-downs

II. FUNCTIONING

Organizing group's work

Praising

Watching the clock

Asking for help

Asking questions

Offering explanations

Paraphrasing others

Clarifying ideas

Energizing the group

Describing one's feelings

III. FORMULATING

Summarizing

Checking answers

Seeking elaborations

Helping the group remember

Giving explanations "out loud"

Planning "out loud"

IV. FERMENTING

Criticizing ideas, not people

Differentiating ideas

Integrating ideas

Asking for reasonings, rationale

Adding further information
or new ideas

Brainstorming many answers

Challenging conclusions
with other information

TRUST ACTIVITIES

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Kindergarten - Grade 1

Brothers and sisters

Pets

Food

Favorite Color

Favorite toy

Vacation

Favorite foods

Color of house

Best friend

Kind people

Birthday month

Wishes

What animal would you be?

Favorite activity

Lucky number

Things that make them happy at home

Things that make them unhappy

Mother's maiden name

Hair color

Eye color

Favorite relative

Grades 2, 3, 4

T.V. shows

Movies

Favorite season

Favorite holiday

Political party

Favorite subject

Favorite sport hero

Favorite sport

Shoe size

Length of hair

Favorite restaurant

Most boring part of vacation

Same initials

Favorite book/book they're reading

Memory from past

Favorite car

Favorite fairy tale character/book character

Share worst nightmare

Favorite zoo animal

Wishes

Pizza

Color of house

Icecream flavor

Favorite pizza place

Your favorite treasure

Favorite computer game

Favorite outfit

Adult

Trust Activities

- Three things I like about (___ grade, ___ school, my job, living in Min, etc.)
- Reason I like/dislike being the (oldest, youngest, middle, only) child in my family.
- A rule I'd like to change and why
- A career I would like and why
- A favorite story character, time of year, president, musician, sport, relative, teacher (excluding present), subject, animal, pet, TV program, kind of pop, gum, ice cream, food, pizza, and why
- Where I wish I was born and why
- A possession I'm pleased with and why
- An important person in my life
- Qualities I like best in a friend
- If I could travel anywhere I would....
- A good movie I've seen is
- If I were rich I would
- I feel on top of the world when I ...
- An organization/club I belong to
- Something I enjoyed in the past is...
- Something I look forward to is...
- When I daydream I often think about...
- A highlight of my week (weekend, year) is...
- The most outrageous thing I've done in my life is...
- Something you wouldn't know about me by just looking at me is...
- Two facts and a lie (guess the lie)
- A pet peeve is...
- I like _____ because _____
- What I don't like about _____ is _____
- Who do you admire?
- The best part about _____ is; the most difficult part about is.....
- I'm sometimes embarrassed by
- My wish is to
- I wish I had a second chance at
- My proudest accomplishment is.....
- I take pride in
- Magazines I subscribe to
- My first paying job
- Something I really want to do

TIPS FOR BUILDING TRUST

When we first put students in groups we often wonder, "Why can't they just work together? Why is one student pulling away from the group? Why is another student dominating?" For a group to be successful, trust must be established first. Trust is the foundation of effective group interaction.

Trust is a risk. If I share my ideas I can either be supported or put down.

Trust includes two kinds of behaviors -

- TRUSTING - risking disclosure of thoughts, ideas, feelings
- TRUSTWORTHINESS - expressing acceptance, support toward another person

Three behaviors that will destroy trust are:

1. rejection, ridicule, or disrespect to other person's disclosure,
2. no reciprocation with disclosure of your own,
3. no disclosure of feelings or thoughts on acceptance, support and cooperativeness have been expressed.

A simple way to build trust is to structure a quick sharing time when students first get in their groups (even if it is the same group they've worked with

before). Be sure to do a quick check, e.g. have one student introduce the group and share, "Where they were born." The following are examples of trust building activities:

Where were you born? Which group has someone born farthest from this room?

Talk about -

- a favorite relative and why.
- a favorite teacher and why.
(excluding present company)
- a favorite hobby/activity.
- a favorite TV show/movie.
- a favorite music group.
- a favorite food color.
- a favorite vacation spot, book, class/subject.

One wish that you could have.

A pet peeve.

Something you are looking forward to.

Teach each other how to spell your first and last names.

(Give a quiz.)

How many brothers and sisters.

The idea is to encourage students to share something personal at a level of comfort. Often students will discover things in common that they weren't aware of before. This kind of activity takes only 5 minutes but helps to create an atmosphere of trust which is the first prerequisite to positive interaction.

NAME _____

GROUP MEMBERS' NAMES _____

☆ PROCESSING STATEMENTS ☆

1. We shared our ideas.

_____ |
Didn't Notice Noticed Really Noticed

2. Our ideas were responded to even if they were not agreed with or used.

_____ |
Didn't Notice Noticed Really Noticed

3. We checked with other group members to make sure they understood how or why we got the answer.

_____ |
Didn't Notice Noticed Really Noticed

4. We watched the clock to complete our task within the given time.

_____ |
Didn't Notice Noticed Really Noticed

5. We praised other group members when they gave good ideas.

_____ |
Didn't Notice Noticed Really Noticed

Observation Sheet

THE OBSERVER

1. Does not participate. Passive observation. Monitors group activities.
2. Looks for and records evidence of expected behaviors (appropriate actions).
3. Gives lots of praise to individuals and groups for good skill use.
4. Discusses observations with the group at the end of the time period.

I heard I saw I noticed

GROUP OBSERVED: _____

Everyone is participating (sharing/
contributing ideas and information).

Everyone is working with the group.

Everyone is taking turns.

Everyone is sticking to the group task.

Everyone agrees before answers are
recorded.

DEAN PHILLIP
AUSTIN, TX

SIGNATURE OF OBSERVER: _____

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ADD-ON OBSERVATION SHEET

Start by teaching one skill and observing for it. Show students how well they do in practicing that skill; praise and otherwise reward their efforts. When they have mastered one skill, add and teach a second skill, etc.

DATE _____ PERIOD _____ OBSERVER _____

Skills	Group Members			

Other Observation Notes:

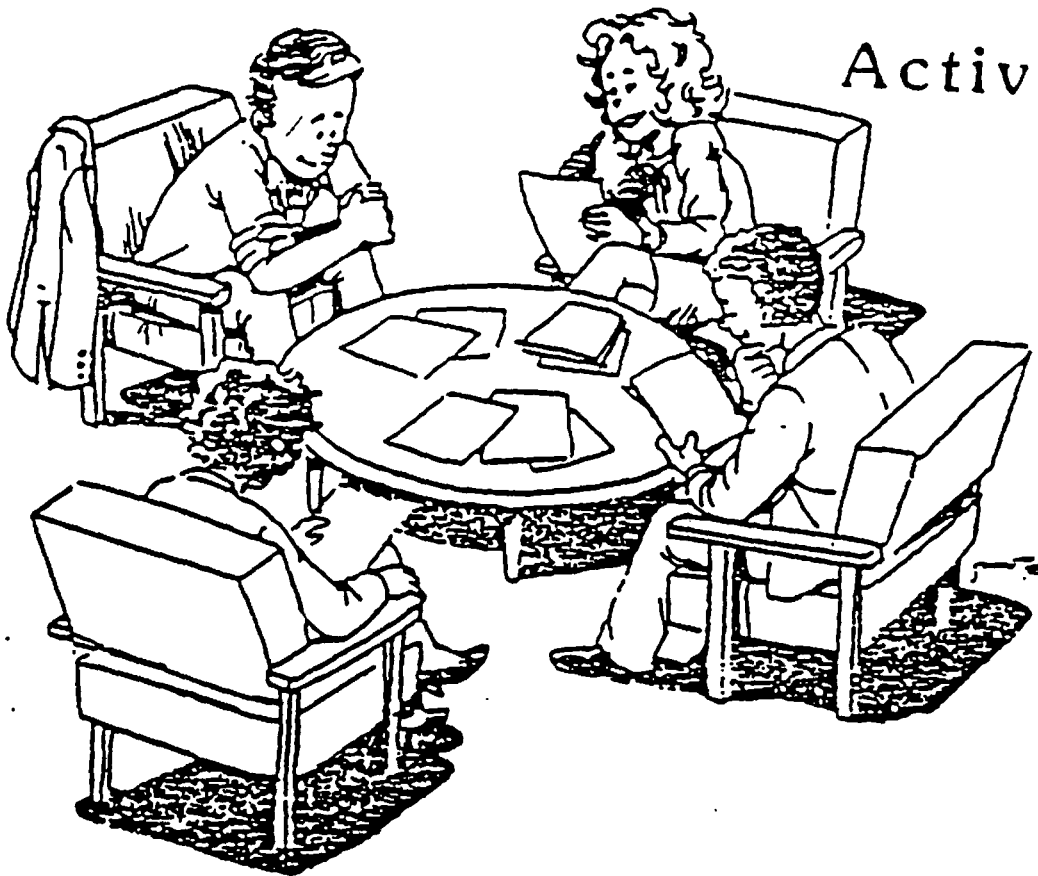
COOPERATIVE SKILLS MATCH

Working with your group, write the number(s) of the skill next to the quotation, which someone using that skill might say. Some quotations may show more than one skill.

Skill	Quotation
1. gives ideas	___ "That's a great idea!"
2. asks questions	___ "What do you think?"
3. keeps things on track	___ "Let's get back to work."
4. summarizes	___ Eye contact
5. coordinates	___ "I disagree with that."
6. encourages others	___ "This is my opinion."
7. replies to ideas	___ "What does that mean?"
8. listens to others	___ "Most of us agree on that."
9. keeps things cool	___ "Let's not get too angry."
10. praises	___ "Let's do it this way."

Cooperative Group

Activities



Cooperative Learning: Five Models

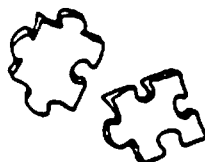
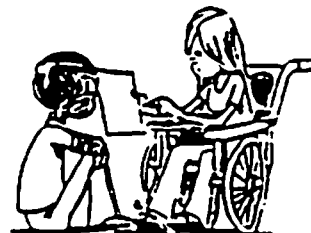
MODEL	CREATOR	DESCRIPTION	PLUSES	MINUSES
The Conceptual Approach	Johnsons Cohen	Theories of cooperation, competition and expectation-state theory	<ul style="list-style-type: none"> + creative teachers create + can easily enhance what experienced teacher already does 	<ul style="list-style-type: none"> - time away from content - no recipes - extra planning time - not step-by-step - unskilled teachers - full commitment
Curriculum Packages Approach	Slavin	Curriculum packages that have cooperative learning structured into the materials	<ul style="list-style-type: none"> + easy to train + daily + pretested strategies + instructional variety (HOT/Dir. instruction) 	<ul style="list-style-type: none"> - no direct teaching of social skill - discourages transfer - not a lot of curriculum packages available
A Structures Approach	Kagan	A repertoire of interactive strategies	<ul style="list-style-type: none"> + simplicity in structures + easy to use + builds repertoire of strategies 	<ul style="list-style-type: none"> - cutesy - assumes transfer - if restricted to low level tasks
The Group Investigation Model	Sharan & Sharan	The ultimate classroom jigsaw	<ul style="list-style-type: none"> + inquiry + social skills + creative problem solving + facilitates skills + gives depth to content 	<ul style="list-style-type: none"> - not good for curriculum coverage - if students have poor social skills - if parents want same assignment for all
The IRI Synthesis with HOT	Bellanca Fogarty	A synthesis of the four cooperative learning approaches with higher order thinking focus	<ul style="list-style-type: none"> + synthesis + creative application + transfer 	<ul style="list-style-type: none"> - needs training - needs commitment from school & district

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Jigsawing Materials

One way to structure positive interdependence among group members is to use the jigsaw method of creating resource interdependence. The steps for structuring a jigsaw lesson are:

1. Distribute a set of materials to each group. The set needs to be divisible into the number of members of the group (2, 3, or 4 parts). Give each member one part of the set of materials.
2. Assign students the individualistic tasks of:
 - a. Learning and becoming an expert on your material.
 - b. Planning how to teach the material to the other members of the group.
3. Assign students the cooperative task of meeting with someone else in the class who is a member of another learning group and who has learned the same material and share ideas as to how the material may best be taught. This is known as an expert pair or expert group.
4. Assign students the cooperative tasks of:
 - a. Teaching their area of expertise to the other group members.
 - b. Learning the material being taught by the other members.
5. Assess students' degree of mastery of all the material. Reward the groups whose members all reach the preset criteria of excellence.



Jigsaw is a flexible way of structuring positive interdependence among group members and teachers have developed many variations. Here are several modifications that are helpful in different circumstances:

1. Substitute pairs for individuals during Step 2.
2. Give students subtopics and have them use reference materials and the library to research their subtopic. This frees the teacher from having to arrange materials in advance.
3. Have the group write a report or give a class presentation on the overall topic, with the specification that it include all the subtopics presented by the group.
4. Prepare outlines or study guides of what each subtopic should cover and have students read the same text, organizing and becoming experts on the material highlighted by their outline or study guide.¹

STAD:

math, language arts, science, foreign languages, social studies (e.g., geography)--any material with a single right answer.

Advantages: frequent quizzes give feedback; relatively quiet and businesslike; improvement scores challenge all students; less time than approaches like TGT; and relatively easy to adapt curriculum materials

How Start: assign teams of 4-5 (balance by gender, race, ethnicity, and performance level); prepare materials; prepare kids and parents; define objectives; present lesson; teams practice/tutor; individual quizzes; compute improvement points; computer team scores; reward teams who meet or exceed.

Improvement Points:

The points kids earn for their teams are the differences between quiz scores and base scores.

If quiz is 10 or more points below based = 0 improvement points.

If 1-10 points below base = 10 improvement points (Confused???)

If 0-10 points above base = 20 improvement points

If more than 10 points above base = 30 improvement points

Perfect papers = 30 improvement points

Team Points:

Enter improvement points on a summary sheet.

For four member teams simply add points up.

For five member teams simply prorate the total points based on the table provided

Recognize Teams: Newsletters, Bulletin Boards; Certificates; Good Teams, Great Teams, and Super Teams

COOPERATIVE

LEARNING

IN:

READING,

WRITING,

SCIENCE,

MATH, ETC...

Bank (1995)

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II. Collaborative Reading and Writing Methods:

Cooperative Reading Methods:

1. **Reciprocal Teaching or Questioning**
students and teacher switch roles; teacher models questions
2. **READER-READERS, SQ3R, PQ4R**
review, eval main ideas, ask q's, draw conclusions.
3. **Cooperative Scripts/MURDER**
(Mood, Understand, Recall, Digest, Expand, Review)
 - a. Cooperative Learning Scripts
 - b. Cooperative Teaching Scripts
4. **Group Reading with different purposes**
(e.g., a management scenario with diff roles)
5. **Structured Controversy**
Read diff sides of a case & debate; switch sides; compromise

Collaborative Writing

1. **Knowledge/Database Creation**
Search Reference Books and Create DataBase
2. **Peer Editing/Feedback**
Share with peer who attempts to summarize & provide self-q's
3. **Electronic Collaboration: Delayed or Realtime**
FirstClass, databases, e-mail, bulletin boards, forums
4. **Publish Class Critiques, Thought Papers, or a Class Newsletters**
5. **Group Feedback**
Group creates draft and individuals revise

II. Specific Cooperative Learning Methods and Ideas

A. Cooperative Reading Methods:

1. Structured Controversy
2. MURDER:
 - a. Cooperative Learning Scripts;
 - b. Cooperative Teaching Scripts
3. Paired Reading--one student reads and the other listens:
 - a. Success for All;
 - b. Reading Recovery
4. Reciprocal Teaching/Questioning--students and teacher switch roles; teacher models questions
5. READER-READERS
6. Cooperative Scripts (i.e., teaching and learning)
7. Paired Repeated Rdg--read passage a number of times with partner helping interpret/comprehend
8. Group Reading with different purposes
9. Cooperative Integrated Reading and Composition (CIRC or B-CIRC; Slavin)
10. Other: Buddy System, Group Retelling, Rdg Strategy Groups, Translation Wtg, REAP, Technology

1. Structuring Cooperative Controversy (NAFTA???, hunting, logging):

- A. Assign heterogeneous groups of four as pairs.
- B. Assign pair perspective and give supporting materials to read.
- C. Present conflicting positions to one another.
- D. Argue strengths and weaknesses.
- E. Take the opposite view without reading it.
- F. Drop assigned roles and work as a foursome toward a consensus.
Tchr encour controversy by: 1. Presenting contrasting viewpoints; 2. Playing devil's advocate.

2. The READERS strategy (Clarke & Bonk, 1992):

1. Review why you are about to read. (with partner)
2. Explore passage for main ideas. (individually)
3. Ask questions about main ideas. (individually)
4. Discuss your questions and draw conclusions. (with partner)
5. Evaluate your conclusions. (with partner)
6. Read for the answers. (individually)
7. Share your findings & summarize your main ideas. (with partner)

3. The READER strategy (Clarke, 1986):

1. Review why you are about to read.
2. Explore passage for main ideas
3. Ask questions about main ideas.
4. Draw conclusions.
5. Evaluate your conclusions.
6. Read for answers & summarize main ideas.

B. Collaborative Writing Ideas

1. Collaborate to write own myths, novels, poems, resumes, songs, news stories, letters to the editor, invitations.
2. Students make vocabulary list on a topic and print it for group.
3. Team plans and outlines and individually writes parts.
4. One member writes and team revises.
5. One member dictates and another transcribes.
6. Groups write on subtopics and how to combine work.
7. Peer Editing/Feedback--student author reads to peer who attempts to summarize & provide self-questions.
8. Database Creation: Search different Reference Books and Create DataBase.
9. Pairs work electronically on local news stories: Computer Chronicles Newswire, published anthologies
10. Electronic Collaboration From: word processing, e-mail, delayed collab, realtime, multimedia.

Table 2

Sample of Methods Available for Cooperative Reading

Note that the first three methods below are useful in other areas besides reading. The remaining seven methods were developed specifically to enhance understanding of text and reading comprehension skills.

1. *Student Team Learning* (e.g., Student Teams-Achievement Divisions (STAD) and Games-Tournaments (TGT) (DeVries, Slavin, Fennessey, Edwards, & Lombardo, 1980; Slavin, 1983a). In these generic cooperative learning methods, students in grades 2-12 work in heterogeneous four- to five-member groups after being presented with lessons by the teacher. They help one another master the worksheets from that lesson. After that, students take a quiz on the material or compete with classmates from other teams with similar achievement, earning points for their team. Team scores are determined based on improvement of all team members over previous scores. Teams with the highest scores are then recognized in a weekly class newsletter.

2. *Learning Together*

This generic method, which is close to pure cooperative learning, is particularly useful for problem solving tasks. After the teacher has presented a lesson, students work in small heterogeneous groups on a common worksheet. Teachers emphasize positive interdependence (sink or swim together), face to face interaction, and individual accountability. Teams receive praise, tokens and grades, but there is no competition between groups or individuals (Johnson & Johnson, 1987).

3. *Structured Controversy*

This method uses controversial or debate-like situations wherein the ideas or theories of one team are made incompatible with those of another, thereby forcing members to attempt to reach a common position (Johnson & Johnson, 1985). Typically, heterogeneous groups of four students are assigned as pairs and given opposing materials to read regarding a particular topic. In terms of cooperative reading activities, students read and discuss the assigned topic with a partner before presenting their ideas to those assigned the differing perspective. Afterwards, students alternate positions, before, finally, writing up a joint report about the issue in question.

4. *Cooperative Scripts*

The cooperative learning script has students working in pairs to better understand text (see also Table 3) (Larson & Dansereau, 1986). When done, the passage goes out of sight and the recaller must summarize from memory what each member of the dyad has just read. The other member acts as listener and attempts to correct errors in passage recall and help make the information more meaningful and memorable. The main focus is to derive meaning from text by interacting with a partner. After each passage segment, the roles are reversed.

5. *READER-READERS*

The READERS strategy is a cooperative script for elementary children (Clarke & Bonk, 1992). The seven components to the READERS script include reviewing the purpose of the assignment, passage exploration, asking questions, discussing questions and drawing conclusions, evaluating conclusions, reading for answers, and sharing findings. In attempting to foster both interaction patterns and self-regulated learning, students using READERS move between individual and paired activities on certain steps. The READER strategy is a similar strategy for individual reading.

6. *Reciprocal Teaching*

This is a technique to help students monitor their own reading comprehension originally developed for learning disabled seventh- and eighth-grade students working in groups of four to eight members (Palincsar & Brown, 1984). The four steps emphasized in this method, summarizing, constructing a question, clarification, and prediction, are first modeled by the teacher and later by peers. After teacher self-verbalization and modeling of strategies, students practice these skills and receive feedback from the teacher. After preliminary strategy internalization, students are given more responsibility for the strategy as they assume the role of the teacher and discussion leader in additional passages. The direct teacher modeling and explanation of underlying processes is faded over time, while feedback is tailored to each student's developmental level.

7. *The Cooperative Integrated Reading and Composition (CIRC) Program*

CIRC, a more structured and eclectic cooperative reading approach, was designed for grades three and four (Stevens, Slavin, & Farnish, 1991). CIRC focuses on: (1) reading comprehension--summarizing and predicting; (2) reading vocabulary--word decoding and spelling; and (3) writing. Activities include teacher instruction, team practice, preassessment, supplemental practice, and quizzes. Typically students are heterogeneously grouped with four members representing two different reading groups. Paired partners from these groupings might listen and comment on each other's reading of a story, make predictions about a story, identify story structure, summarize major episodes of stories, master main ideas, draw conclusions, and compare and contrast ideas.

8. *Paired Repeated Reading:*

Students select their own passage of about 50 words for silent reading. When ready, one student reads his/her passage aloud three different times to a partner. After the third reading, the listener tells his partner how his reading improved and the roles are switched. Teacher modeling of the listener role is important to strategy success (Koskinen & Blum, 1986). The method is applicable across a wide range of ages and ability levels (Dowhower, 1987).

9. *Paired Reading:*

In paired reading (Topping, 1987), tutees select material to read, while the tutors provide help by reading with the tutee during difficult sections of text, repeating mispronounced words, and offering praise and encouragement. Though useful in home, school, and adult literacy programs, the expert-novice tutoring framework distinguishes it from more team-based cooperative reading approaches. Although both cooperative learning and peer tutoring are emphasized by Topping (1989), cooperative learning components remain unclear. Reciprocal peer tutoring arrangements might better approximate cooperative reading principles and create a more equal learning partnership.

10. *Technology-Supported Cooperative Reading*

A number of uses have made of technologies to support cooperative reading activities (Hythecker et al., 1985; Salomon, Globerson, & Guterman, 1989; Swallow, Scardamalia, & Olivier, 1988). For instance, questions embedded in electronic text can prompt metacognitive reflection, interactive dialogue, and knowledge construction when reading text. Computer-based tools that might foster cooperative reading activities include concept mapping aids, thinking skill prompts, outliners, idea generators, group activity or reflection logs, hypertext devices, notecard and commenting systems, electronic books, and co-authoring tools. Other technology like multimedia and hypermedia involve students in discovering and co-constructing new meaning from text, thereby creating more rich representations of text and deeper grasp of passage structure.



Reading Assignments:

13 Interactive Strategies for Making Sure Your Students Read Them

by Sivasailam Thiagarajan

Many courses use reading assignments to ensure timely coverage of topics. But, most students do not bother to read the assignments because they could always wing it during the discussion session or because the instructor will lecture on the same content under the guise of a discussion.

To get the maximum mileage out of reading assignments, I have designed a few strategies that combine game elements and peer pressure to increase the probability of every student reading every assignment. These strategies are not substitutes for preparing your lectures or designing instructional materials. Before selecting and assigning readings, you should be familiar with their content and specific with your objectives. You should also construct appropriate test items to measure the student mastery of the content and the objectives.

Verbal Repertoire

An implicit objective for information-rich courses is for the participant to demonstrate verbal fluency—to do a "snow job." To achieve this objective, we want the student to retrieve, resequence, and

rephrase information in rapid response to questions.

Here are two games suited for this type of objective:

Game 1. Third Degree

As you assign the readings to your students, ask them not only to master the content, but also to prepare a set of questions to challenge others. Warn your students that they will be subjected to an inquisition, a third degree, or a dissertation defense.

On the day of judgment, divide the class into groups of five students. Within each group, identify the first victim through some random means (such as selecting the tallest person). For the next 3 minutes, the four inquisitioners in the group pounce upon this hapless victim and pile up various questions. Players need not take turns, be polite, or wait for the student to finish an answer before firing the next question. There need not be any logical sequence among the questions. The whole idea is to try to confound the victim.

At the end of 3 minutes, stop the torture. Ask the current victim to select a new victim. Repeat the procedure for another 3 minutes. Continue the process until all students have had an opportunity to be the victim.

To make this activity into more of a game, use a scoring procedure. At the end of the last inquisition, ask each student to distribute 100 points among the other four players on the basis of their relative performance. Students do this by writing the points on pieces of paper, folding them, and placing them in front of the appropriate person. Each student opens the pieces of paper and adds up the points. The player with the highest total wins the game.

Game 2. Press Conference

Divide the class into three teams and assign a separate reading for each team. During the next class meeting, select a team and announce its topic. Ask the team members to get ready for a press conference on their assigned topic. Ask the other students to each write down three questions on this topic on three index cards. Mix up the question cards and redistribute them, three to a student.

Assemble the press conference team in front of the classroom. The other students now take turns to ask a question from their cards. When it is his or her turn, the student selects a question which is not redundant to a previous one but is closely related to it.

The questioner should identify a specific member of the press con-

ference team to respond. After this response, any other member of the team may present additional points or clarifications. The game continues in this fashion until all questions are covered. (During later rounds, a student may pass instead of reading a question if the cards contain only redundant items.)

At the conclusion of this press conference, members of the other two teams get together and identify the three most important points from the question-and-answer session. After 5 minutes, each team makes a presentation of its conclusions. The press conference team listens to both presentations and decides which team did a better job.

The same procedure is repeated with the other teams as expert panels.

Recall of Facts

Ability to answer factual questions is positively correlated with high scores in trivia games—and in life. Here are two games that encourage learners to pay attention to specific details in their readings.

Game 3. Team Quiz

Divide the class into three teams when you assign the readings. Give the task of preparing a set of questions on a third of the reading assignment to each team so that the three teams together cover the entire content.

On the discussion day, the first team (with questions on the first part of the reading assignment) conducts a quiz program. An emcee from this team asks a question of a selected student from Team 2. If this student immediately gives the correct answer, his or her team gets 2 points. If he or she has to consult with teammates to give the correct answer, the team scores 1 point. If the answer is incorrect, the team loses a point.

The first team continues the quiz, one question at a time, alter-

nating the teams and selecting a specific player to respond. This phase of the game ends after 15 minutes. The second team now takes over and conducts its quiz using questions from the second part of the reading assignment. At the end of the class period, all three teams would have had an opportunity to conduct a quiz and to answer questions during two other quizzes. The team with the highest score wins the game.

Game 4. The Question Game

As you assign the reading, ask each student to prepare 10 question cards. In each of these cards, one side should contain a question and the other side the correct answer. Provide some sample questions including technical terms that need definition, definitions that need to be matched with technical terms, examples that need to be put into concept classes, concept classes that need examples, true/false items, and multiple-choice items.

During the next class meeting, divide the class into groups of four or five. Ask members of each group to mix up their cards and exchange them with another group.

The Question Game begins with the group placing the cards, question side up, in the middle of the table. The first player reads the question on the top card, without removing it from the pile. He or she has 15 seconds to come up with the answer—or a bluff. After the player gives the answer, any other player may challenge it by giving a better answer. If there is no challenge, the first player may state that the answer was a bluff.

The question card is now turned over to reveal the correct answer. If the player's answer is correct, he or she gets 1 point (2 points if there was a challenge). The challenger gets 2 points for a correct challenge. If the original player bluffed successfully, he or she gets 2 points.

It is now the turn of the next player to read the question on the next card. The game continues as

before and ends when all the question cards are used up. The player with the highest score in the group is the winner.

Important Points

Different readers perceive different points as the important ones in what they read. A comparison and discussion of these differences could contribute to a better understanding of an article. Here are two games which encourage students to do that.

Game 5. Priority Plus

As you assign a reading, ask students to pay particular attention to the important points in the article. Encourage them to underline these points and to summarize them on the margins.

During the next class meeting, divide the class into teams of four to six players. Ask each team to prepare a list of the important points from the article. After sufficient time, ask teams to take turns to supply items from their lists to a common list. Write down the items on a blackboard until a dozen get listed.

Ask each team to study the list and to secretly select the most important item. Circulate among the teams and collect the selections. Announce these selections and award points according to this formula: 1 point for each team selecting the same item. (For example, if three teams chose Item 7 and two teams chose Item 11, they would score 3 points and 2 points respectively.)

Cross off the item which received the most choices. Ask the teams to choose the next most important item from those remaining. Continue the same scoring and selection procedure until the top five items are selected.

During any round in which two or more items are tied in the selection process, award scores as usual, but do not cross off the

items. Permit a 2-minute persuasion period during which different teams make appeals for the selection of their items. Continue the game as before.

The team with the highest score at the end of the game is the winner.

Game 6. Group Grope

As you assign the reading to your class, ask students to pay particular attention to the important points in the article. Ask each student to write four important points, each on a separate index card. Prepare a large set of such index cards yourself, including some trivial and some controversial points.

During the next class meeting, collect the cards from the students

and add them to the ones you have prepared. Mix them well and randomly distribute three cards to each student. Ask them to study the points on the cards and to arrange them according to their personal perception of the importance, from the most to the least important one.

Spread the remaining cards on a large table. Tell the students that they may discard any cards and pick up more important replacements. During this activity, students are not permitted to talk to each other.

After the exchange, give some time for the students to study and rearrange their three cards. Ask them to swap cards with each other to make their hands contain more important ideas. Any student may exchange cards with any other stu-

dent; every student must exchange at least one card.

After this exchange period, direct students to compare their cards with each other and to form coalitions with people of similar opinions. There is no limit to the number of students who may team up together, but each team must reduce its collection to three cards. At the end of this reductionist activity, instruct each team to prepare a poster that nonverbally reflects its important points. This poster should not contain any text and should be completed within 5 minutes.

End the class meeting with a show-and-tell session during which each team reads its three cards, justifies its selection, displays the poster, and explains the symbolism.

How To Make Your Reading Assignments More Effective

Here are some more ideas for improving the efficiency of assigned readings.

Instructional Design

- Conduct a content analysis of the reading assignment. Specify instructional objectives based on your content analysis.
- Construct criterion questions to measure the achievement of your instructional objectives. Prepare two parallel sets of criterion questions.

Production

- Don't be a pirate. Obtain permission for photocopying from the copyright holder.
- Provide a bibliographic citation in some prominent place so the reader can locate the original.

- Copy on only one side of the page so the other side can be used for notes.

Study Aids

- Write a short introduction to explain how the article fits in with the rest of the course.
- Provide an abstract to highlight important ideas.
- Provide an outline of the article, if its structure is not clearly presented through headings and subheadings.
- Provide a short glossary, if necessary.
- Provide an index. Have your learners prepare the index.
- Provide forms for structured notetaking and for preparing an abstract.
- Train your students on efficient reading and notetaking techniques (e.g., SQ3R approach).

Summary Judgment

One good way to force readers to pay attention to the theme and important conclusions of an article (rather than to specific but trivial details) is to require them to write a summary. Here are two games which make use of this fact.

Game 7. Different Strokes

There are many ways an article can be summarized:

- a one-page summary
- a three-page summary
- a one-sentence summary
- a conventional outline
- an outline made of bubbles and lines as in Tony Bazun's *Mindmaps*
- an outline in the form of a hierarchy diagram
- a flowchart summarizing the model presented in the article
- a visual summary without any text or numbers
- a checklist of important points in the article
- a bumper sticker
- a T-shirt message
- a slogan

To make a game out of these alternative approaches for summarizing an article, prepare two index cards specifying each type of summary. Prepare as many index cards as you have students so that each type of summary will be independently prepared by two students. (If you have an odd number of students in your class, have one set of three students do the same type of summary.)

During the next class meeting, all students turn in two copies of their summaries, one with their name (for your later evaluation), and the other with a secret ID number. Divide the group into dyads (with one triad if your class has an odd number of students). Redistribute two summaries of the same type to each group and ask the students to decide which one is better. The dyad identifies the better summary with a happy face.

Paste up all summaries on the wall and have the students spend the next 20 minutes selectively reading them to reinforce their mastery of the article and to see how their summaries compare with the others.

Game 8. Two Heads Vs. One

Ask your students to read the assigned article and to prepare two copies of a summary of about 100 words. During the next class meeting, collect one set of summaries for your later evaluation and randomly pair up the other set of summaries. Identify the two students in each pair, return their original summaries to them and ask them to produce a joint summary (of about 100 words) which will borrow from—and improve—the individual summaries. Ask the students to bring you two copies of the joint summaries—one with their names and the other with an ID number. Assemble the dyads and have each dyad assemble the two individual summaries and one joint summary. Redistribute these sets to different dyads, in a random order, making sure no dyad receives its own product. Ask each dyad to critically evaluate the three summaries and rank them 1 for the best, 2 for

the second best, and 3 for the third. Collect the graded summaries and return the sets to the original dyads. Explain that if the joint summary received a lower rating than either (or both) of the individual summaries, the dyad has failed in its task.

A Procedure for Procedures

The focus of a reading assignment could be a procedure (e.g., computing the cycle costs for educating a child through secondary school). If the mastery of a step-by-step procedure is your objective, you can add excitement to the reading assignment by using this game.

Game 9. Chain Gang

Divide the reading assignment into three or four equal parts. For example, if the procedure has nine steps, you may divide the article into three parts, each explaining three steps. Add some introductory materials to the second and third parts to identify the outputs of the previous steps. Distribute the reading assignments so that equal numbers of students get each of the three parts. Ask the students to read their assignments and master the steps.

During the next class meeting, have each student identify two other students who have mastered the other two steps in the procedure. Each triad should have all the steps required for the complete procedure. Ask the triads to go to different corners of the room and teach each other until everyone has mastered the steps in the complete procedure. The best way to do this is to work out a sample problem from the beginning to the end.

As soon as a team feels that its members have mastered the steps, remove the readings and give them a criterion problem to be solved individually. If all three students get the correct answer within a reasonable time, they pass the test.

If one or more is unable to get the answer, send the team back for more mutual instruction.

Near the end of the class meeting, invite each team to send its best performer to a tournament. Conduct a timed test with these representatives competing against each other on different sections of the blackboard or on flipchart paper. The student who finishes first (and gets the correct answer) wins for his or her team.

Handling Heuristics

If your reading assignment deals with a heuristic for solving problems, the best way to test students' mastery is to provide a typical problem and have them solve it. Here is a game to add excitement to this evaluation procedure.

Game 10. The Envelope Game

Assign the reading as usual and inform the students they will be tested on their ability to apply the heuristic to an actual problem. Suggest that students make up their own sample problems for practice.

During the next class meeting, divide students into teams of three to five. Give a large envelope to each team. Ask the teams to write a problem to test the application of the heuristic on the face of the envelope (the side where the address usually goes). Give an appropriate time limit.

After this task is completed, ask each team to pass its envelope to the next one. Now ask the teams to read the problem on the envelope and to come up with a solution. Teams write their solutions on a sheet of paper and place it inside the envelope. Again, give an appropriate time limit.

At the end of this time limit, have the teams pass the envelopes (with the solutions inside) to the next team. Without opening the envelope, have the teams read the

problem on the envelope and repeat the procedure of solving it, placing the solution inside the envelope, and passing the envelope to the next team. Do this as often as needed until each problem envelope returns to the team which created it in the first place.

Have the teams open the envelope and compare the solutions inside. Each team then ranks the solutions from the best to the worst. After all teams have rated all solutions, place them on a table. Have the teams retrieve their solutions and compute their total score by giving themselves 5 points for the best solution, 3 for the second best, and 1 for the third. Identify the winning team and applaud its expertise.

Point-Counterpoint

Sometimes the value of your reading assignment lies in its controversial nature. To encourage students to read critically and to express their opinions for or against various stands, you may use this game.

Game 11. The Great Debate

Assign one or more articles on a controversial topic to your students. Ask the students to read critically and prepare themselves for a debate.

During the next class meeting, with the help of your students, identify major controversial issues and state them as propositions for a debate. For example, let us assume you have identified four controversial issues. Divide the class into eight teams (twice as many teams as there are issues). For each team, assign one of the issues and a *pro* or *con* stance. Ask the teams to retire to various corners of the room and to prepare their cases for or against the issue. The teams should incorporate ideas from their readings in their arguments. Give the teams a time limit for getting ready for the debate.

Hold a series of mini-debates in which teams for or against an issue make their presentations. To decide which team won in each mini-

debate, use an outsider as a judge. Alternatively, have all students decide who won or lost each mini-debate by raising their hands. In either case, wait until all the debates are completed before identifying winning teams.

Tutorial Support

Students sometimes cheat by not reading the assigned article, reading somebody else's notes instead. Also, some students persuade others to do the reading and give them a briefing. If you cannot beat them, why not join them? These two games encourage and reinforce students for helping each other with their reading assignments.

Game 12. Outlines and Outlines

Divide the class into two equal groups and assign different readings to each group. Ask each student to carefully study the assignment and to prepare an outline to help some other student study it.

During the next class meeting, all students turn in two copies of their outlines, one with their names and the others anonymous. You keep the signed copy for later evaluation and grading.

For the next assignment, each student reads the article assigned to the other group. To assist the students, you provide each with one of the anonymous outlines.

During the next class meeting, students exchange the outlines they had used for another anonymous outline of the same reading assignment. They review the reading assignment using the new outline.

Each student has thus read an article, prepared an outline of it, and read and reviewed another article using two different outlines. Each student now decides which of the two outlines was more useful.

The selected outlines are adorned with one or two happy faces and picked up by their originators.

Game 13. Tutorial Race

Divide the class into three or more equal groups and assign a separate reading for each group. During the next class meeting, explain that each student is to tutor another—or be tutored by another—who has not read the same assignment. At the end of a tutoring session, the tutor and the tutee should locate a tester who has completed the same reading assignment. This tester conducts an oral examination. If the tutee flunks the examination, he or she is returned to the tutor for additional instruction. If the tutee passes, he or she is certified to teach or test this topic (in addition to the topic of the original reading assignment).

At the end of the class period, collect information on how many tutees have mastered each reading and display it on the blackboard. Ask students to continue the tutoring and testing process outside of the class meetings until all students have mastered the contents of all reading assignments. To maintain motivation, collect and display progress data at the beginning of each class meeting. To ensure equity, insist that every student should have played the roles of tutor, tutee, and tester at least once. To ensure quality control, conduct your own oral re-examinations of random students. After everyone has mastered everything, identify the student who has done the most tutoring and present him or her with the *Outstanding Tutor Award*.

Conclusion

You can mix and match these strategies to suit your content and your instructional objectives. You can create your own strategies by combining elements of these strategies. While doing so, remember that the basic principles behind follow-up activities to reading assignments should be the same as those for effective instructional design: active processing of the content, immediate application of the skills, and mutual teaching and learning.

Components of Cooperative Reading Methods **(Bonk, in press)**

Method Similarities

- (1) introduction of the strategy;
- (2) explanation of the purpose; (ownership)
- (3) teacher and peer modeling of the method;
- (4) guided interaction and negotiation of meaning;
- (5) multiple passage readings and encodings;
- (6) presentation of conflicting viewpoints;
- (7) elaboration, dialogue, and summarization;
- (8) diagnosis of misunderstandings;
- (9) internalization and ownership over the strategy;
- (10) teacher and peer feedback and assistance.

Method Differences:

- (1) the extent of teacher or student direction;
- (2) practice or length of treatment;
- (3) goals/focus;
- (4) text type;
- (5) recommended age group;
- (6) group size (typically 2-4);
- (7) student roles and interaction;
- (8) quality of interaction;
- (9) reward structures; and
- (10) technological intervention.

Sample of Cognitive Processing Activities During Cooperative Reading.

Cooperative Prereading Activities:

1. asking and recording questions to be answered.
2. scanning text/headings and making content predictions.
3. relating passage content to prior knowledge/experiences.
4. generating analogies and inferences about the text.
5. charting, outlining, or graphing for comparisons/contrasts.

Cooperative Postreading Activities:

6. explaining/expanding on one's knowledge discoveries.
7. discussing and summarizing main ideas.
8. deciding upon the relevance and utility of information.
9. identifying story structure and constructing story theme.
10. providing hints/supports in comprehension monitoring.
11. critiquing missing info & diagnosing misunderstandings.
12. paraphrasing, defending, and refining conflicting ideas.
13. modeling question-asking and other cognitive strategies.
14. evaluating and comparing oneself to others.
15. evaluating strategic effectiveness.

Cooperative Learning and Cooperative Teaching Scripts (see Dansereau, 1987; p. 616).

Cooperative learning script	Cooperative teaching script
1. Flip a coin to determine who will be Partner A and Partner B.	1. Flip a coin to determine who will be Partner A and Partner B.
2. Both partners read Passage I.	2. Partner A reads Passage I. Partner B reads Passage II.
3. When both are finished, put the passage out of sight.	3. When both are finished, put the passage out of sight.
4. Partner A orally summarizes the contents of Passage I.	4. Partner A orally summarizes (teacher) the contents of Passage I.
5. Partner B detects and corrects any errors in Partner A's summary (<u>metacognition</u> step).	5. Partner B asks clarifying questions (<u>metacognition</u> step).
6. Both partners work together to develop analogies, images, etc., to help make the summarized information memorable (<u>elaboration</u> step).	6. Partners work together to develop analogies, images, etc., to help make Passage I information memorable (<u>elaboration</u> step).
7. Both partners read Passage II.	7. Repeat steps 4-6 for Passage II, with partners reversing roles.
8. Repeat steps 4-6 with partners reversing roles.	8. Both partners read the passage that they did not read originally.

The READER strategy (Clarke, 1986):

1. Review why you are about to read.
2. Explore passage for main ideas
3. Ask questions about main ideas.
4. Draw conclusions.
5. Evaluate your conclusions.
6. Read for answers & summarize main ideas.

The READERS strategy (Clarke & Bonk, 1992):

1. Review why you are about to read. (with partner)
2. Explore passage for main ideas. (individually)
3. Ask questions about main ideas. (individually)
4. Discuss your questions and draw conclusions. (with partner)
5. Evaluate your conclusions. (with partner)
6. Read for the answers. (individually)
7. Share your findings & summarize main ideas. (with partner)

Robert E. Slavin (1994)

Educational Psychology

Theory and Practice

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How Do Metacognitive Skills Help Students Learn?

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1990; Stevens *et al.*, 1987) have taught students to look for characters, settings, problems, and problem solutions in stories, starting with specific questions and then letting students find these critical elements on their own. Paris *et al.* (1984) and King (1992a) found that students comprehended better if they were taught to ask themselves *who, what, where, and how* questions as they read. Englert *et al.* (1991) gave students planning sheets to help them plan creative writing. Among the questions students were taught to ask themselves were "For whom am I writing? What is being explained? What are the steps?" Essentially, students are taught to talk themselves through the activities they are engaged in, asking themselves or each other the questions a teacher would ask. Students have been successfully taught to talk themselves through mathematics problem solving (Cardelle-Elawar, 1990), spelling (Block and Peskowitz, 1990), creative writing (Zellermayer *et al.*, 1991), and many other subjects (see Chan *et al.*, 1992; Guthrie *et al.*, 1991).

Reciprocal Teaching

TEST BANK 7.17, 7.22, 7.34, 7.54, 7.63, 7.73-7.74, 7.81

One well-researched example of a constructivist approach based on principles of question-generation is reciprocal teaching (Palincsar and Brown, 1984). This approach, designed primarily to help low achievers learn reading comprehension, involves the teacher working with small groups of students. Initially the teacher models questions students might ask as they read, but soon students are appointed to act as "teacher" to generate questions for each other. Figure 7.2 presents an example of reciprocal teaching in use. Note in the example how the teacher directs the conversation about crows at first, but then turns the responsibility over to Jim (who is about to turn it over to another student as the example ends). The teacher is modeling the behaviors she wants the students to be able to do on their own and then changes her role to that of facilitator and organizer as the students begin to generate the actual questions. Research on reciprocal teaching has generally found this strategy to increase the achievement of low achievers (Palincsar and Brown, 1984; Palincsar, 1987; Lysynchuk *et al.*, 1990; Rosenshine and Meister, 1991).

REFLECTION AND JOURNAL WRITING. Ask students to reflect on their own cognitive strengths and weaknesses and uses of metacognitive strategies.

MULTICULTURAL AWARENESS: For discussions of metacognitive differences in diverse classrooms, see Carrell, P.L., Pharis, B.G., and Liberto, J.C. (1989). Metacognitive strategy training for ESL reading. *TESOL Quarterly*, 23, 647-678; and Reyes, M.L., and Molnar, L.A. (1991). Instructional strategies for second-language learners in content areas. *Journal of Reading*, 35, 96-103.

Theory Into Practice

Introducing Reciprocal Teaching

In introducing reciprocal teaching to students, you might begin as follows: "For the coming weeks we will be working together to improve your ability to understand what you read. Sometimes we are so busy figuring out what the words are that we fail to pay much attention to what the words and sentences mean. We will be learning a way to pay more attention to what we are reading. I will teach you to do the following activities as you read:

1. To think of important questions that might be asked about what is being read and to be sure that you can answer those questions.
2. To summarize the most important information that you have read.
3. To predict what the author might discuss next in the passage.
4. To point out when something is unclear in the passage or doesn't make sense and then to see if we can make sense of it.

reciprocal teaching: based on the principles of question generation, teaches metacognitive skills through instruction and teacher modeling to improve the reading performance of students who have poor comprehension.

Figure 7.2

Example of a Reciprocal Teaching Lesson

Adapted from Palincsar, 1986b, pp. 73-98.

TEACHER: The title of this story is "Genius with Feathers." Let's have some predictions. I will begin by guessing that this story will be about birds that are very smart. Why do I say that?

FIRST STUDENT: Because a genius is someone very smart.

SECOND STUDENT: Because they have feathers.

TEACHER: That's right. Birds are the only animals that have feathers. Let's predict now the kind of information you might read about very smart birds.

THIRD STUDENT: What kinds of birds?

TEACHER: Good question.

What kinds would you guess are very smart?

THIRD STUDENT: Parrots or blue jays.

FIRST STUDENT: A cockatoo.

TEACHER: What other information would you want to know? (No response from students.)

TEACHER: I would like to know what these birds do that is so smart. Any ideas?

SECOND STUDENT: Some birds talk.

FOURTH STUDENT: They can fly.

TEACHER: That's an interesting one. As smart as people are, they can't fly. Well, let's read this first section now and see how many of our predictions were right. I will be the teacher for this section. (All read the section silently.)

TEACHER: Who is the genius with feathers?

FIRST STUDENT: Crows.

TEACHER: That's right. We were correct in our prediction that this story would be about birds, but we didn't correctly

guess which kind of bird, did we? My summary of the first section would be that it describes the clever things that crows do, which make them seem quite intelligent.

Let's read on. Who will be the teacher for this section? Jim?

JIM: How do crows communicate with one another?

TEACHER: Good question! You picked right up on our prediction that this is about the way crows communicate. Whom do you choose to answer your question?

JIM: Barbara.

BARBARA: Crows have built-in radar and a relay system.

JIM: That's a good part of it. The answer I wanted was how they relay the messages from one crow to the other crow.

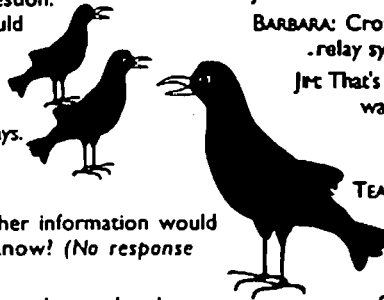
TEACHER: Summarize now.

JIM: This is about how crows have developed a system of communication.

TEACHER: That's right. The paragraph goes on to give examples of how they use pitch and changes in interval, but these are supporting details. The main idea is that crows communicate through a relay system. Jim?

JIM: It says in this section that crows can use their communication system to play tricks, so I predict the next section will say something about the tricks crows play. I would like Sue to be the next teacher.

Teacher: Excellent prediction. The last sentence of a paragraph often suggests what the next paragraph will be about. Good, Jim.



"These activities will help you keep your attention on what you are reading and make sure that you are understanding it.

"The way in which you will learn these four activities is by taking turns in the role of teacher during our reading group sessions. When I am the teacher, I will show you how I read carefully by telling you the questions I made up while reading, by summarizing the most important information I read, and by predicting what I think the author might discuss next. I will also tell you if I found anything I read to be unclear or confusing and how I made sense out of it.

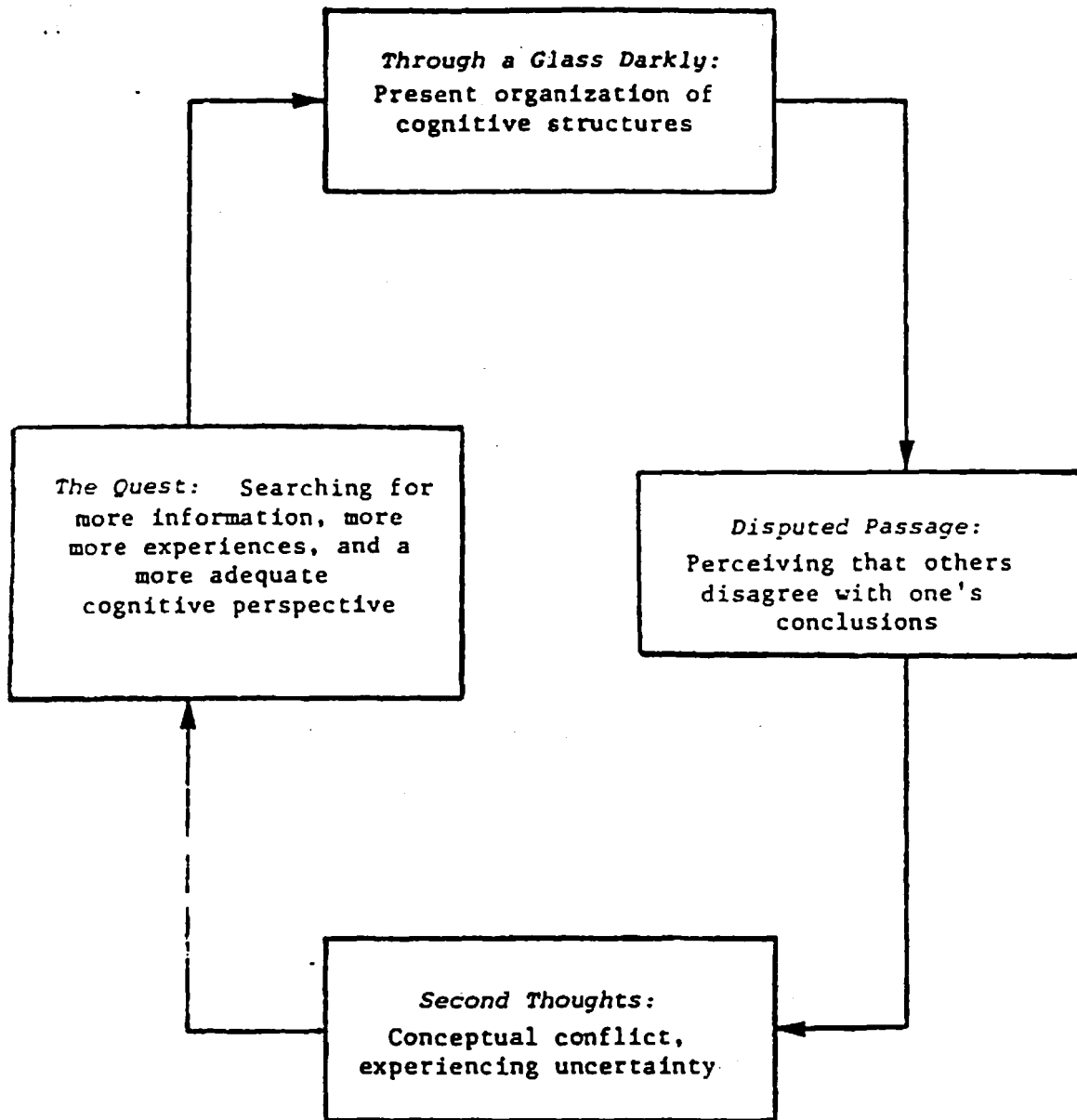
Table 3

Nonempirically Based Cooperative Reading Methods

1. **Associational dialogue**-Students organize notes around key concepts provided by the teacher. Students discuss in groups what they have written on the list (Wood, 1987).
2. **The buddy system**-students in mixed-ability groups are told they are responsible for each other's learning (Wood, 1987).
3. **Group retelling**-students working in dyads and triads select related articles to read and retell in their own words. Group members assist and add related facts from the articles they have read (Wood, 1987).
4. **Cybernetic sessions**-students work in small groups to respond to questions placed around the room (Wood, 1987).
5. **Reading strategy groups**-students evaluate different reading strategies for personal usefulness and then work in cooperative groups with individuals who have similar preferences. Interaction guidelines are determined by the class or the group (Montague & Tanner, 1987).
6. **Translation writing**-cooperative groups produce a more readable digest of a book that students of lower-ability have trouble reading. Students read a paragraph together and then think of the main ideas (Maring, Furman, & Blum-Anderson, 1985).
7. **Small group structured overview**-students work in small groups to decide on the 10-20 most important concepts which the students then put on task cards and later compare to the terms and relationships selected by both other groups and the teacher (Maring, Furman, & Blum-Anderson, 1985).
8. **REAP-Reading Experiences Associated with Partners**-this approach to science attempts to bridge the reading process and product. Students, working with partners, select reading activities from a set of ten task cards and must complete 8 of 10 in order to be considered successful on that learning activity (DiSibio & Parla, 1985).
9. **Paired repeated readings**-students select their own passage of 50 words for silent reading. Later, one student reads his/her passage aloud three different times to a partner. Then the listener tells his partner how his reading improved and the roles are switched (Koskinen & Blum, 1986).

Bank (1991) AERA
 The Emergence of Cooperative Reading:
 Analyzing Components of Successful
 Programs and Strategies.

page 400



Model 1:

The Process by Which Controversy Promotes Learning

April, 1985

Roger T. Johnson

David W. Johnson

Structural Conflict in Science Classrooms

page 461

Figure 2:

Teacher's Instructions for Setting Up a Controversy

1. Meet with your partner and plan how to argue effectively for your position. Make sure you and your partner have mastered as much of the position as possible.
2. Each pair presents their position. Be forceful and persuasive in presenting your position. Take notes and clarify anything you do not understand when the opposing pair presents their position.
3. Open discussion. Argue forcefully and persuasively for your position, presenting as many facts as you can to support your point of view. Critically listen to the opposing pair's position, asking them for the facts that support their point of view. Remember, this is a complex issue and you need to know both sides to write a good report. Work together as a total group to get all the facts out. Make sure you understand the facts that support both points of view.
4. Role reversal. Reverse the perspectives in the group by each pair arguing the opposing pair's position. In arguing for the opposing pair's position, be as forceful and persuasive as you can. See if you can think of any new facts that the opposing pair did not think to present. Elaborate their position.
5. Come to a group decision that all four of you can agree with. Summarize the best arguments for both points of view. Detail what you know (facts) about each side. When you have consensus in your group, organize your arguments to present to the entire class. Other groups may make the opposite decision and you need to defend the validity of your decision to the entire class.

One Method: Structuring Cooperative Controversy

- A. Assign heterogeneous groups of four as pairs.**
- B. Assign each pair an alternative to the same case to read.**
- C. Present conflicting positions to one another.**
- D. Argue strengths and weaknesses.**
- E. Take the opposite view without reading it.**
- F. Drop assigned roles and work as a foursome toward a consensus.**

Or with just pairs/partners:

- 1. Read same case, one summarizes and other critiques missing info, and both decide solution (reverse roles)**
- 2. Read different cases, summarize to each other their case, develop analogies, decide cases answer (read opposite case)**
- 3. Review/survey case, ask self questions about it, discuss with partner and draw preliminary conclusions, read for answers, share findings**

Teacher encourages interactions and positive controversy by:

- 1. Presenting contrasting viewpoints.**
- 2. Playing devil's advocate.**
- 3. Taking sides in a group to help out group and then switching.**
- 4. Encouraging students to push and probe each other for rationale.**
- 5. Monitoring how students process their actions.**
- 6. Emphasize rational and spirited discussion/argumentation.**
- 7. Restate the case question(s).**
- 8. Ask for clarification, rationale, example, implications.**
- 9. Ask follow-up questions.**
- 10. Present Case C alternative.**

Structured Controversy Task

- a. Group by car you drive.
- b. You will be assigned to one of four groups. Please be prepared to make 3-4 arguments for the position you have been given using your text, lecture, and video info as resources (be sure to name your group).
 - Grp 1
 - a. I think cooperative learning is here to stay and teaches important skills (B&F pp. 241-242)
 - b. I think cooperative learning is a fad and we need to stick to the basics.
 - Grp 2
 - a. In cooperative learning one should use group grades (B&F, pp. 231-232)
Raise the group average, raise individual scores based on improvement, increase individual mastery with team assistance, give a bonus for cooperative skills.
 - b. In cooperative learning one should have individual grades (B&F, pp. 230-231)
 - Grp 3
 - a. In cooperative learning one should have no grades (B&F, p. 232-233)
Tight Checker, Traveler, Trust activities, Review social skills, Random oral quizzes, Post-Activity quiz, Write a summary paper, Sign on the Line, Explain to a neighbor, Get all to sign: "I made my best contribution. _____", Hold a tournament, Group evaluator Checklist/Feedback/Sharing, Complete related homework, Test, Evaluate a neighbor, Roundrobin answers, Share group projects, Explain others' answers, Jigsaw, Indiv Apply, Make log entries, Tchr Observes, Make a team ad.
 - b. In cooperative learning one should grade cooperative processes (B&F, p. 230)
Grade based on using social skills desired, grade contributions helpful to the group, give bonus points for displayed social skills, do not punish or lower grades for poor use of social skills.
- c. Fill out p. xxx
- d. Switch sides and continue debate
- e. Come to some consensus.
- f. See Blueprints p. 139: What to do when you disagree (argue, persuade, vote, compromise, mediate, arbitrate, delay, reconceptualize, negotiate, give in, seek consensus, humor, avoid)

Table 2

Sequence of steps within a virtual debate (Cummings, 2000)

Virtual Debate Steps
1. Instructor selects controversial topic with input from class
2. Instructor divides class into subtopic pairs.
3. Instructor assigns subtopic to each pair, one as critic and one as defender.
4. Critic and defender pairs post initial position statements.
5. Students review all initial position statements.
6. Students reply to at least two position statements of other groups with comments or questions.
7. Each student rebuts the opposing initial statement from the individual in his/her pair.
8. Based on a review of all statements, comments, and questions, students formulate personal positions.
9. Students post personal position statements in private forums.

From
(Bank, Wisler, & Lee in press)

E-bate

IU tests on-line debate opportunity

By Rose McIlwain

Clear a space between "eavesdrop" and "ebb" in the Webster's New Collegiate Dictionary's next edition. There's a new word to go in there, and it's "E-bate."

Coined by Indiana University Professor Henry Merrill of the School of Continuing Studies (SCS), the word describes an on-line debate between groups in his Adult Education D506 course called "The Adult as Client of Education."

Merrill's previous students had already expressed their opinions on class topics in chat rooms set up for them with the help of Andrea McRobbie, SCS' director of Internet and Multimedia Research and Development.

"Over the period of running that course for the first time on the Web, Professor Merrill became fairly adept at using the discussion forums," said McRobbie. "Each week his students would have a particular discussion forum related to each week's lesson and they also used it for producing assignments. He would break them into groups, and we had special discussion forums set up for each of these groups in advance."

"There are two different kinds of discussion forums on the Web. One is what's called a chat, which is normally in real time, meaning that people meet at the same time, but in different places. One person types, the next person can respond immediately, and it's like a scrolling discussion. It keeps going on, with everyone seeing all the messages as, or just after, they are written, and the

older messages disappear from view to make way for new messages.

"There's often no real structure to what's going on," she said.

The other kind of discussion on the Web that's used is more like a Usenet news group. It's called an "asynchronous" or "threaded" discussion.

McRobbie explained that a person will start a discussion topic or "thread" and then when somebody responds, it makes a tree of responses which stay on the Web. So there can be quite a detailed discussion, and people can come back a week later and make a response.

Merrill ran his course on the Web for the second time using OnCourse, a stand-alone courseware system that runs on the Web. OnCourse was developed by the WeLab on the IUPUI campus. This time he added more structure to the course chat by designing it as an "E-bate."

"The students enjoyed the E-bate because they liked the structure of it. I sent a proposition to debate in advance so the students could sign up for the side they wanted. One group went to a new chat room, and the other one stayed in the one we already had," said Merrill. He gave the students 20

minutes to shape their case and elect someone to summarize it.

Then they returned to the original chat room where they typed in their respective positions. The students then had about 20 minutes for a general discussion.

Of the students who participated in the E-bate, all are living in Indiana except one, who is in Ohio, but is working through the IU East campus.

OnCourse was developed by the WeLab at IUPUI.

The camaraderie developed among the students in his first Web course prompted them to ask for a discussion forum of their own.

"They called it 'In the Hall.' It was more for general discussions, and they did things like announce when somebody had a baby, or swap Internet or computing tips and URLs," said McRobbie.

For more on OnCourse go to

<http://www.indiana.edu/~studied/resources/face022.htm>



Happy 30th birthday, Internet!



Traditionally aged students in IU's Class of '03 won't remember the birthday of the Internet, but then, their parents probably won't either.

On September 2, 1969, researchers at the University of California at Los Angeles, led by computer scientist Leonard Kleinrock, established what UCLA considers

"the world's first Internet connection"

It was on that inauspicious autumn day in Kleinrock's university laboratory that two machines were connected to form ARPANET, the network that was to grow into the phenomenon known as the Internet.

IU, IBM team up for data storage initiative

By Karen Adams

Indiana University and IBM have announced an agreement to work together to upgrade IU's information technology (IT) infrastructure and collaborate on joint research projects.

As part of the agreement, IU will make significant acquisitions of IBM hardware and software.

The agreement covers three areas identified in IU's recent IT Technology Strategic Plan as critical to the university's future technology and research capabilities: massive data storage, supercomputing, and the platform for IU's new central information systems.

Central to the agreement is IU's massive data storage initiative. IU joins Los Alamos National Laboratory and other leading national laboratories, as well as an elite group of universities, in using High Performance Storage System (HPSS) and Distributed File System (DFS) software for data management. The HPSS software was developed by IBM and five U.S. Department of Energy laboratories. The DFS software was developed by Transarc Corp., a subsidiary of IBM.

The HPSS software will enable IU to expand its storage system to provide extensive capacity for IU researchers who need to store and access huge amounts of data. IU's Bloomington campus will be

The IBM RS/6000 SP

system uses the same technology behind the "Deep Blue"

supercomputer that beat Gary Kasparov at chess.

one of the first educational sites in the world where student users can access such a vast data resource from their personal computers, using a Web-based interface being developed by IU.

Additionally, the HPSS software will automate all of the magnetic tape-handling activities for IU's administrative systems, currently being done manually.

"The ability to store vast amounts of data will have an enormous effect on research at IU. No longer will researchers be hamstrung by not being able to store enough data in a readily accessible way," said Michael McRobbie, IU vice president for information technology and chief information officer. "This initiative will enable whole new research projects to be started in areas as diverse as data mining, astrophysics, high energy physics and bioinformatics."

Read more on line at this site:

<http://www.iuinfo.indiana.edu/ocm/releases/iuIBM.htm>

STRUCTURED CONTROVERSY

TASK:

OUR POINTS

THEIR POINTS



JOINT DECISIONS

JOINT DECISIONS	

Collaborative Writing

10 Electronic Collaborative Writing Projects:

1. pairs work electronically on local news stories
2. collaborate to write own myths, novels, or poems
3. students make vocabulary list on a topic and print it for group
4. read different reference books and together form database
5. write/react to other papers from any distance in PC windows
6. instructor and peers point out editorial changes electronically
7. team plans and outlines and individually writes parts
8. one member writes and team revises
9. one member dictates and another transcribes
10. groups write on subtopics and how to combine work

page 468
Bonk (1991)

CONNECT YOUR CLASSROOMS

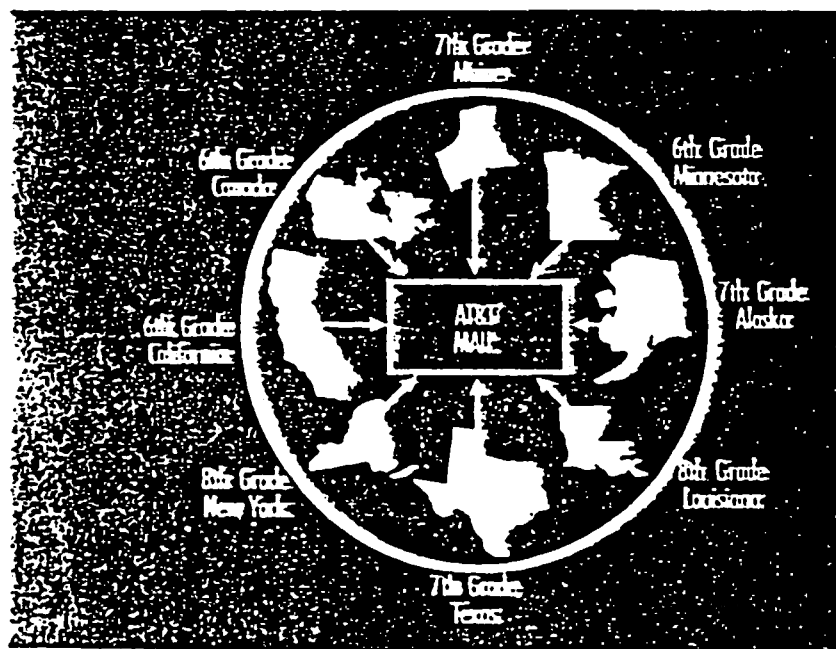


How your Learning Circle may look

WITH AN EXCITING WORLD OF LEARNING

The Innovative, Affordable Educational Program.

AT&T
Learning Network



Geographic diversity is just one of the criteria used in Learning Circle

STUDENT CHARTS

Cooperative Learning Rules

1. Work in groups of two to four.
2. Rotate roles.
3. Everyone must agree before information is entered into the computer.
4. Ask other group members for help when needed.
5. Summarize and explain to partner(s) what you are learning.
6. At the end of the lesson, briefly discuss how well you worked together and make recommendations for improving next time.

Roles/Responsibilities

- | | |
|-------------------|---|
| Keyboarder | Enters group's decision into the computer. |
| Recorder | Records information from group decisions and from the computer. Everyone should take a turn at this job. Whenever possible all group members should record all the information. |
| Checker | Requires group members to demonstrate understanding and checks for group agreement. |
| Encourager | Encourages all students to participate by directly asking for their information and expertise and by reinforcing them for contributing. |

Example 3: Writing Reports with Word Processors

A combined procedure for using cooperative learning procedures with individualistic work in using a word processor to write reports or other assignments is as follows:

1. The teacher assigns students to pairs with at least one good reader in each pair.
2. The teacher assigns the task of completing a report on a specified topic on the word processor. The students are to achieve this task by completing the following procedure:
 - a. Student A describes to Student B what he or she is planning to write.
 - b. Student B listens carefully, probes with a set of questions, and outlines Student A's report.
 - c. This procedure is reversed with Student B describing what he or she is going to write and Student A listening and completing an outline of Student B's report.
 - d. The students research individually the material they need to write their assignments, keeping an eye out for material useful to their partner.
 - e. The two students, using the word processor, work together to write the first paragraph of each assignment to ensure that they both have a clear start on their compositions.
 - f. The students then work individually to enter their reports on the word processor.
 - g. When the students finish, they proofread a printout of each other's work, make corrections in capitalization, punctuation, spelling, language usage, topic sentence usage, and other aspects of writing that the teacher specified. The teacher also encourages the students to provide each other with suggestions for revision.
 - h. The students revise their work on the word processor.
 - i. The two students then reread each other's assignments, and sign their names (indicating that they guarantee that no errors exist).
3. The teacher structures positive goal interdependence by informing students that one of their scores for the material will be the total number of errors made by the pair (the number of errors in student A's report plus the number of errors in student B's report). The teacher may also give a score on the quality of each student's work.
4. The teacher tells the students to begin and then monitors the pairs, intervening where appropriate to help students master writing and collaborative skills.
5. When the group finishes the unit, the teacher has the students discuss how effectively they worked together (listing the specific actions they engaged in to help each other), plan what behaviors they are going to emphasize in the next writing pair, and thank each other for the help and assistance each other provided.

Teachers can use a modification of this procedure when a cooperative group is preparing a single lab report for the group.

David W. Johnson
 Roger T. Johnson (1988)
 Cooperative Learning and the Computer
 AETS Yearbook 1, Information, Technology
 page 471

Partner Activity : Name some collaborative writing activities and methods.

Cooperative Writing Activities:

Short Stories

Research Reports

Review of Books

News Stories

Cartoons

Advertisements

Song Lyrics

Poetry

Public Notices--posters, announcements

Eulogies

Interviews

Last Will and Testaments

Awards

Letters of Thanks

Letters to the Editor

Resumes and Cover Letters

Invitations

(Bonk, 1991)

Ten Skills Addressed by Collaborative Software:

1. communication skills
2. critical thinking
3. teamwork/interpersonal skills
4. global awareness and social interaction
5. problem solving skills
6. academic self-concept
7. creativity and flexible thinking
8. reflectivity
9. perspective-taking
10. knowledge building

Ten Cognitive Learning Principles With Collaborative Software:

- (1) building on student existing knowledge;
- (2) creating dialogue to uncover students' thought processes;
- (3) making learning relevant;
- (4) incorporating opportunities for product ownership;
- (5) supporting student risk-taking and cooperative learning;
- (6) realizing knowledge is constructed/organized in varied ways;
- (7) realizing the connectedness of knowledge;
- (8) providing interactivity and immediate feedback;
- (9) internalizing strategies and processes modeled;
- (10) realizing that knowledge must be socially constructed.

Bank (1991)

(Lehrer, 1994)

230 MULTIMEDIA AND MEGACHANGE

TABLE 1. Cognitive Components of Hypermedia-Based Design

<u>Design Component</u>	<u>Primary Skills Involved</u>
Defining the Nature of the Problem	Question posing
Problem Decomposition	Team collaboration
Project Management	Task & Role Assignments, Developing timelines
Finding Information	Document search techniques Using keywords in electronic search
Developing New Information	Interviewing, Developing questionnaires, etc.
Selecting Information	Note taking, Summarization, Data analysis
Organizing Information	Use of database tools, Semantic mapping
Representing Information	Segmenting video & sound Interleaving media, Graphics & video production
Evaluating the Design	Articulating intentions Public speaking Use of display tools
Revising the Design	Taking design as an object for thought Soliciting peer feedback

C. Ten Science CL Ideas:

1. Group Reading with different purposes:
2. Numbered Heads Together (Difficult Chemical Symbols)
4. Roundtable (global warming)
5. Learning Together (problem solving worksheets, labs)
6. Think-Pair-Share (Video Segments)
7. Group Investigation (any type of experiment)
8. Value Line and Modification of Structured Controversy method
9. Jigsaw Themes: "Air," "The Planet Earth," "Pollution," and "The Greenhouse Effect"
10. Technology Projects: Database Creation, Labnet, e-mail, bulletin boards, forums, MBL
10. Collaborative Writing and Group Investigation: Museums, newspapers, career info, pollution, population

Sample CL Science Lessons:**1. Science Lab Reports**

1. All complete task independently
2. Compare results.
3. Arrive at an agreement.
4. Put group's agreed-upon responses on summary sheet with all names (attach indiv work).

2. Group Reading with different purposes:

(Start out with weird facts: e.g., all oysters start out as males or frogs have teeth in the roofs of their mouths)

1. All members read the same material
2. Each grp has a diff task (grp. #1 identifies two causes and two effects; grp. #2 locates two facts and opinions, grp #3 suggests alternatives; grp 4 asks questions of the author)
3. read newspaper article (e.g., Peasants in Rural China Raise Babies in Bags of Sand)
4. Students are anxious to discuss
5. Time to read and think
6. Pair and share
7. Total group sharing
8. Grp #1 shares a statement, then grp #2, then grp #3...
9. Alternative explanations are offered

3. Numbered Heads Together--teacher calls a number to respond (Difficult Chemical Symbols)

1. Everyone studies together for "x" minutes
2. Number kids by counting off 1, 2, 3, 4
3. Say, "Today #3 will take the quiz for the group"
4. When done, grp gets "x" minutes to check paper &, if all agrees, they can change any answer.
5. Put all names on the back and turn in.

4a. Roundtable (Global Warming)

1. Use roundtable to review global warming issue/question
2. one piece of paper is rotated around the table
3. Groups of 4 are allowed 1 piece of paper and pencil
4. Each student lists all solutions he/she can recall.
5. can ask for team member assistance (or pass)
6. pass until time limit has expired or all responses recorded
7. reporter shares the ideas with the class

4b. Roundtable (9th Grade Biology)

1. Use roundtable technique to review chemical symbols
2. Groups of 4 are allowed 1 piece of paper and pencil
3. Each student lists all symbols he/she can recall.
4. After a few minutes each group shares answers
5. (see Jigsaw for alternatives)

5. Learning Together (Space Ship)

A neutron bomb is headed to the United States and the U.S. is sending one in retaliation. The end of the world is likely. A space ship has capacity to set up life on a new planet. Eleven persons were chosen by lot, but the space is more limited than thought. Only 7 of 11 originally planned will travel to a new planet and your group must decide who will go. You must have agreement of the whole group before a selection can be made.

1. 30-year-old symphony orchestra violin player
2. 67 " " male minister
3. 23 " " engineer and 21 yr-old wife (refuse separation)
4. 40 " " policeman (who refuses separation from his gun)
5. male student your age from your school
6. 25 year old h.s. drop-out, recently arrested for armed robbery
7. 32 year old female 6th-grade teacher
8. 40 " " female doctor (medical)
9. 50 " " female artist and sculptor
10. 25 " " male poet
11. 1 " " female child

6. Jigsaw in a Middle School: (This is really a combined method example)

1. sit in clusters of 4
2. in prep for lab they reflect on basic chemical reactions
3. list terms associated with reactions on a piece of paper
 - a. (e.g., reactants, products, synthesis, decomp, precipitate, gases, single or double replacement)
4. share lists
5. teacher clarifies and discusses upcoming experiment
6. groups add words to collective knowledge base
7. use Jigsaw in groups of 4
8. find out all they can about 4 basic reaction types
9. Expert groups move to assigned tables
 - a. perform experiments (synthesis, decomposition, single replacement, double replacement)
10. Questions: What happens when something burns? What is combined? What is the product?
11. Research and write proper equation
12. Return to home groups eager to share new knowledge.
13. Teach comments, corrects, and suggests
14. Group earns bonus points for reaching criterion grades

7. Value Line and Modification of Structured Controversy method (Draw value line on stmts)

1. "The power company should build another nuclear power plant in my state."
2. "Eugenics will produce a super race."
 - a. Work in groups of 4 and mark the line and initial their marks
 - b. Use pens/pencils for chips, lay their "chips" down after they have spoken
 - c. No one may speak again until all 4 have spoken
 - d. May change position on the value line
 - e. Listen to each others views again

8. Learning Together Method (Lab Projects)

1. Small, hetero groups 2-3 (random or structured)
2. Each group a single lab sheet and set of equipment.
3. Work to a process, concept, or finding each could defend.
4. Obligated to work together, actively listen, work on joint report
5. Teacher monitors select behaviors and takes notes.
6. Save last 5 minutes to see how well worked together.

9. Science Lab Projects With Roles

1. Assign topic
2. Assign roles (recorders, time keepers, materials handlers, communicators)
3. Do problems individually and compare answers and model solutions
4. Arrive at an agreement to solutions
5. Put all grp's agreed-upon responses on summary sheet with all names (attach individual work)

10. Labnet

1. Project-based (PESL), MBL, and Bulletin boards, e-mail, and forums
2. In small incremental steps attack physics teacher isolation and put learner in a community
3. Share lesson plans and activities
4. Decide what to share and how to share
5. Decide on assessment of cognitive skills

11. Think-Pair-Share (e.g., College Biology)

1. Every 15-20 minutes write down the most important impt. pt (sometimes with a question)
2. Share with each other (on difficult pts work in groups of 2-3)
3. Clear up misconceptions

12. Alternatives to Think-Pair-Share (e.g., in STS or Physics)

1. Present new material on global warming and potential problem
2. Talk about and decipher the problem, what are the tasks
3. Draw a little sketch of the problem
4. Discuss different ways to attack the problem

13. Group Investigation and Computers and Cooperative Learning (note: use broad themes like "Air," "The Planet Earth," "Pollution," and "The Greenhouse Effect" to stimulate small-group research)

1. Database Creation
 - a. Students read different reference books
 - b. Focus on one aspect of topic studied
 - c. Gather at computer database
 - d. Together have info to complete database fields
 - e. Merge info with entire class

14. Collaborative Writing and Learning Together Middle School (Global Problem Statistics)

1. Use world population statistics and calculators
2. Make comparisons between land size and population
3. Graph regions by size/kilometer on each continent
4. Calculate people/kilometer in each continent and chart answer
6. Describe what you can now infer in your group of 4-5
7. Look up annual food production for a region
8. Write a joint description of how this compares to land size and pop.

15. Collaborative Writing (Using the Newspaper)

1. Use major newspaper like New York Times and have weekly science and technology sections
2. select significant terms from lead stories.
3. Pass out photocopies and construct fiction stories

16. Collaborative Writing and Group Investigation (Museums)

1. Work in pairs and play the role of curator.
2. Investigate bones, fossils, shells, etc...
3. Find out all that they can about the object they select
4. Have students in groups of 4 create a fictitious but plausible scenario to accompany object.
5. Return to class and present problem and findings

17. Collaborative Writing and Group Investigation (Careers)

1. Gather info on science in the workplace and careers
2. Draw up a simple survey form listing occupations
3. Gather data about the ways science is used on the job
4. Students interview workers, parents, professionals about science tools in the workplace
5. Have groups assemble and display data
6. Look for patterns and comparisons
7. Write up report

18. Group Investigation (Pollution)

1. Have student teams use observation sheets to record pollution in their neighborhood.
2. Classify based on senses and different spheres of the earth for 1 week.
3. Discuss the groups' observations with the class
4. Discuss discrepancies in groups' data.
5. Predict future patterns
6. Make a visual representation of the data.

19. Group Investigation (Video Segments)

1. Tape short science/tech video segment (e.g., NOVA, 3-2-1 Contact, Weather Channel)
2. Design projects (e.g., endangered species mural, chart weather patterns, computer newsletter)
3. Allow student team choice on projects
4. Present projects

20. Graphing/Constructing (Any area)

1. Work in pairs and gather data (e.g., pulse rates when exercise)
2. Seek meaningful relationships among data
3. Write about and graph data relationships (generate, discuss, modify, sequence, and rearrange)
4. Title/label the graph.

MORE SCIENCE IDEAS

(What else could you do?)

Additional Thinking skill links!!! (circle one)

1. Do *wet ink* on most fun or best hands-on science activity ever
2. This class was like a _____.
3. Force field anal/PMI: on ozone depletion or burning fossil fuels
4. Other pts of view: company president, residents, mayor
5. Brainstorm: ways to decrease rate of ozone depletion
6. Reverse BS: ways to increase the rate of ozone depletion
7. Debate issues: what might happen with increased short wave radiation
8. Summarize a lecture on ozone
9. Rearrange facts/what if--videos on ozone depletion
10. Fishbowl on a controversial article on the ozone
11. Working backward--from a possible answer to the problem
12. Other techniques

What else? (circle one)

levels of q's, creating Matrices (yes/no or content categories), finding biased/slanted data, examining alternatives-consequences or pos-neg consequences, filling in a C-Map/Web for a chain of events, observation logs and journals, games and tournaments, simulating the environment, interviewing experts or elderly, bringing in authentic data from home, focus on different aspects of the problem, categorization schemes, generating graphs and models from data, predicting outcomes, comparing and contrasting, attribute listing, modification, or transformation, creating mnemonics and acronyms, ranking ideas, finding patterns and recognizing logical relationships, hypothesis creation and testing, reflection questions and thought/white papers, Venn diagrams, follow-up discussions, use symbols for thinking processes (e.g., recall, cause-effect, or similarity)

Three Step Interviews

Team Builder and Review of Key Pts of Coop Learning (so far)

- a. Line up by date born. Pair up and group by month born.
- b. In pairs, interview partner for 5 minutes (max)--Sample starter questions:
 1. Which are the generic methods are useful to you.
 2. What are impt ideas you have heard in this class about cooperative learning?
 3. What is an interesting idea or two that caught your eye about coop. learning?
 4. What are some of the dumb ideas you have heard about cooperative learning?
- c. Reverse roles (for another 5 minutes)
- d. Pairs join to form groups of four
- e. Roundrobin sharing what you learned in the interview
- f. Is there a possible Jigsaw variation to this method...

How can you spot a teacher using cooperative learning ineffectively?

Ideas for a Student Top Ten List

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____
- h. _____
- i. _____
- j. _____
- k. _____
- l. _____
- m. _____
- n. _____
- o. _____
- p. _____
- q. _____
- r. _____
- s. _____

**Top 10 ways you know are you not engaging your students:
(Per students in this class form 1996-1998)**

10. Plants get more engaged time than the students.
9. The majority of the class is in timeout and not concerned about coming back.
8. Everyone wants the role of surfer dude, slacker, or slug.
7. Cooperative learning materials are being used for practicing one's shot.
6. Instructor turns blue and faints while holding his breath until "Everyone's eyes are on the board."
5. The World Trade Center, Waco, and the Oklahoma City bombings were all linked to former students in his class.
4. Instructor comes to class sporting a walkman and a virtual reality headset.
3. Teacher affection consists of the words "lowlife" and "stupid."
2. The principal's office wants to see the instructor immediately since no one has complained today.
1. Beavis and Butthead think that this is a cool place.

COOPERATIVE

GROUPING,

DISCUSSION,

AND

INTERACTION.

STRUCTURES

RECAP

page 483

Overall Summary of CL Methods:

I. Generic Methods:

1. STAD
 2. Teams-Games-Tournaments
 3. Jigsaw I
 4. Jigsaw 2
 5. Learning Together
 6. Group Investigation
 7. Coop Coop
-

8. **Numbered Heads Together** (e.g., count off 1, 2, 3, 4; work on prob, one grp and # is called on).
("Today #3 will take the quiz for grp; grp checks it in "X" minutes & put all names on it & turn it in).
9. **Think-Pair-Share** (students are cued to think with wait time, then share with partners, then class share).
10. **Roundrobin** (students contribute ideas orally in turn to q or prob, clockwise or counterclockwise).
11. **Roundtable** (one piece of paper is rotated around the table).
12. **Team Concept-Webs** (roundtable/robin of core concepts to generate a diagram of team ideas).
13. **Structured Controversy** (pairs are assigned opposing roles in debate situation and roles are reversed).
14. **Mind Swap** (partners dump their knowledge to each other).
15. **Interview Partner** (interview partner & then explain their pt of view to another grp in a roundrobin).
16. **Think-Pair/List/Web** (these are adaptations of the previous strategies).
17. **Group Disc. with Roles** (assign diff thkg or processing roles to class members to cover all angles).
18. **Weird Facts** (start task, rdg, or grp activity with a strange but true facts that encourages interaction).
19. **Turn to Your Partner and...**, (homework partners, worksheet checkers, test reviewers, drill partners).
20. **Paired Partners: Think Aloud** (one partner talks thru prob & the other listens, q's, & monitors).
21. **Triads: Observer Feedback** (two partners work together while a third takes notes & reports on it).
22. **Tell and Retell** (show and tell with partners: partners tell own stories and retell someone elses).
23. **Traveling clusters: People Search** (searching for partic. patterns, people, traits, concepts, answers).
24. **One stay, Three Stray, or, Three Stray, One Stay** (some rotate, others stay to explain/continue wrkg).
25. **Inside-Outside** (teams face each other & present, inner then outer circle and then give appreciations).
26. **Gallery Tours** (move about the room and give feedback on sheet perhaps)
27. **Stand & Share** (teams stand as know the answer & tchr calls on one & sit as your answer is revealed)
28. **Forced Response: Wrap Around** (in roundrobin, students respond to lead-in stmt from the teacher).
29. **Team Value Lines or Human Graphs of Resp** (take a stance & then listen to others in class/team).
30. **Tag games, Hug Tag, Fantasy Play, Car & Driver, Grp Challenges** (coop play to for the playground).

Other Classroom Structures that Encourage Student Participation:

1. group discussion--pool ideas of group
2. buzz groups--small group of 4-6 followed by disc. in entire group
3. panel discussion--4-8 member panel informally discusses topic
4. symposium--disc. in phases by series of experts
5. debates--pro and con of a controversial issue
6. concentric circles--inner circle disc and outer listen and then is reversed.
7. reaction sheets--group reacts to predetermined controversial or important ideas
8. Phillips 66--6 people discuss topic for 6 minutes
9. role play--act out a situation with group defined roles and then discuss
10. picture making--4-5 sub-groups make illustrations about major ideas or principles

Alternatives (circle one you could/would use and below it write why):

1. i.e., group discussion, buzz groups symposium, panel groups, debates, concentric circles, reaction sheets, Phillips 66, role play, picture making...

Cooperative Learning: Domain Specific Stuff

a. Applying Generic Cooperative Learning Methods in Science

1. Group Reading with different purposes (read same passage for different reasons/views)
2. Numbered Heads Together (Difficult Chemical Symbols)
4. Roundtable (global warming)
5. Learning Together or Group Investigation (problem solving worksheets, labs, any experiment)
6. Think-Pair-Share (Video Segments)
7. Value Line and Modification of Structured Controversy method
8. Jigsaw Themes: "Air," "The Planet Earth," "Pollution," and "The Greenhouse Effect"
9. Technology Projects: Database Creation, Labnet, e-mail, bulletin boards, micro labs
10. Group Investigation and Collaborative Writing: Museums, career info, pollution, population

b. Cooperative Reading Methods:

1. Cooperative Learning Scripts
2. Cooperative Teaching Scripts
3. Reciprocal Teaching--students and teacher switch roles and model how to ask good q's of text
4. Reciprocal Questioning
5. READER-READERS (Clarke & Bonk, 1992)
6. Group Reading with different purposes
7. Paired Reading--one student reads and the other listens: a. Success for All; b. Reading Recovery
8. Cooperative Integrated Reading and Composition (CIRC)
9. Other: Buddy System, Group Retelling, Reading Strategy Groups, Translation Writing
10. Technology Supported Cooperative Reading

c. Collaborative Writing Ideas

1. collaborate to write own myths, novels, poems, resumes, songs, news stories, letters to the editor.
2. students make vocabulary list on a topic and print it for group.
3. team plans and outlines and individually writes parts.
4. one member writes and team revises.
5. one member dictates and another transcribes.
6. groups write on subtopics and how to combine work.
7. Peer Editing/Feedback--student author reads to peer.
8. Search different Reference Books and Create DataBase.
9. pairs work electronically on local news stories.
10. Electronic Collaboration From: word processing, e-mail, delayed collab, real-time, multimedia.

d. What about math...or social studies or art or music or PE or foreign languages or...???

The Risk Taking Continuum:

Low Risk <-----> High Risk

Phillips 66	PBL
Turn to Your Partner	Electronic Cafes
PMI, KWL	6 Hats
Summing Up	Mock Trials
Brainstorming	Metaphorical Thinking

BS, Rev BS, Wet Ink, Web, Cr. Dramatics
Minute Paper, Cases, Debate, Elec CMaps
Think-Pr-Sh, # Heads, Jigsaw, Human Gr.

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Simple Structures

Corners:

Teacher selects a topic and assigns four choices. The students select one of the four corners of the room. Students within each corner pair up and share the reason for choosing the corner. A person from one corner shares with the class and then a person from a different corner paraphrases what has been said.

Three-Step Interview:

Students form pairs. Using interview/listening techniques that have been modeled, one student interviews another about an announced topic. When time is up, students switch roles as interviewer and interviewee. Pairs then join to form groups of four. Students take turns introducing their pair partners and sharing what the pair partners had to say. Can be used as a teambuilder, opinion questions, predicting, evaluation, sharing book reports, etc. (Spencer Kagan)

Think-Pair-Share:

Discussion strategy that incorporates wait time and aspects of cooperative learning. Students learn to LISTEN while a question is posed, THINK (without raising hands) of a response, PAIR with a neighbor to discuss their responses, and SHARE their responses with the whole class. Time limits and transition cues help discussions move smoothly. Students are able to rehearse responses mentally and verbally, and all students have an opportunity to talk. (Frank Lyman)

THINK - Teacher asks a question, think about the answer

PAIR - Students pair with partner to share answers

SHARE - Share partner's answer with the class, share own affirmed answer with the class

Roundrobin or Roundtable:

Roundtable is useful for brainstorming, reviewing, or practicing while also serving as a teambuilder. Roundrobin is oral response instead of paper. Sequential form: Students sit in teams of 3 or more, with one piece of paper and one pencil. The teacher asks a question which has multiple answers. Students take turns writing one answer on the paper, then passing the paper and pencil clockwise to the next person. When time is called, teams with the most correct answers are recognized. Teams reflect on their strategies and consider ways they could improve.

Simultaneous form: Each student starts a piece of paper, writes an answer, and passes it, so several papers are moving at once. (Spencer Kagan)

Numbered Heads Together:

Useful for quickly reviewing objective material in a fun way. The students in each team are numbered (each team might have 4 students numbered 1, 2, 3, 4). Students coach each other on material to be mastered. Teachers pose a question and call a number. Only the students with that number are eligible to answer and earn points for their team. Builds both individual accountability and positive interdependence. May be done with only one student in the class responding (sequential form), or with all the number 3's, for instance, responding using an Every Pupil Response technique such as slates or hand signals (simultaneous form). (Spencer Kagan)

Line-Ups:

Students line up in a given order - age, birthday, alphabetical, time sequence, etc.

Partner Editing:

Students work in pairs to coach each other. Editing the writing occurs in three rounds: punctuation, capitalization, and spelling.

Punctuation: Teach the students to listen for the pauses as a story is read aloud. When there is a breath, a period is needed. When there is a slight pause, a comma is needed. Partner #1 reads orally and partner #2 marks the pauses he/she hears with a period or a comma. Reverse the activity till both have had a chance to read orally and mark the punctuation.

Capitalization: Whole class reviews proper use of capital letters. Partners read through the writing checking for correct capitalization.

Spelling: To check a paper for spelling, it is helpful to read the paper backwards. Each word is carefully read starting with the last word and moving toward the beginning word. When the reader hesitates over an unknown word, he/she circles the word and continues until the total paper has been read and words have been circled. Then partners exchange papers and read each other's papers backwards. Then students use dictionaries to correct or verify correct spelling of marked words.

Word Webbing (Clustering or Semantic Mapping):

Each team has a large sheet of butcher paper or newsprint. Each student has a different colored marker. The main topic is written in the center of the paper. The team member should use Roundtable to add subtopics and then anyone can add additional details.

Resources for Structures:

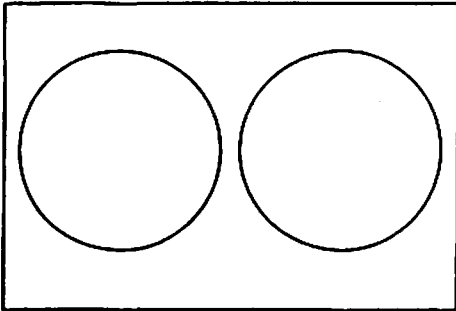
Kagan, Spencer. Cooperative Learning Resources for Teachers. (1989). \$20

Curran, Lorna. Cooperative Learning & Literature: Lessons for Little Ones. (K-2) (1989). \$15

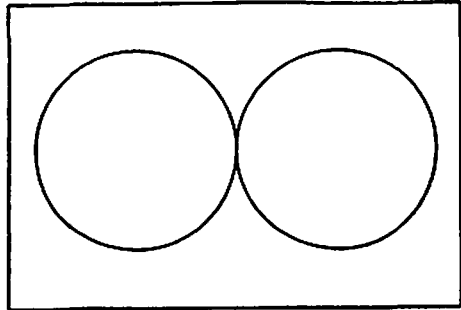
Stone, Jeanne. Cooperative Learning and Language Arts: A Multi-Structural Approach. (K-8) (1989). \$15

To order: Resources for Teachers
27134 Paseo Espada #202
San Juan Capistrano, CA 92675

MODEL #3

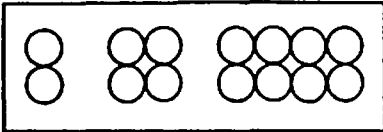

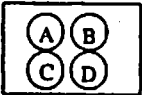
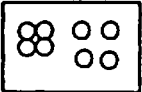
Source	Type of Interaction
Weaver & Cotrell, 1986	<p align="center">Turn To Your Partner And... (TTYPA)</p> 
Description	
An informal strategy used throughout an input sequence in which two students discuss ideas discussed in the lecture.	
(Suggested) Prescription	Lesson: Down Memory Lane Level: Grade 8
Use to punctuate a lecture, a film or a reading. After 7-8 minutes of straight talk, students need to be actively cued and engaged.	This informal, quick interaction in which students turn to a partner and dialogue briefly on a specifically directed task is used effectively as students are guided to model both cognition and metacognition in a lesson on thinking.
Notes	Vignette: TTYPA
Lecturer	<i>Metacognition is thinking about your thinking. Let me demonstrate.</i>
TTYPA	<i>Turn to your partner and recite a piece you know by memory. Then, switch roles and listen to your partner's memorized piece.</i>
Student #1 response	<i>Four score and seven years ago . . .</i>
Student #2 response	<i>We the people of the United States . . .</i>
Lecturer	<i>That's called cognition.</i>
TTYPA	<i>Now, TTYPA tell each other how you learned that piece by heart so well that you could say it today.</i>
Student response	<i>I learned by repeating . . .</i>
Lecturer	<i>Thinking about how you learned is called metacognition.</i>

MODEL #4

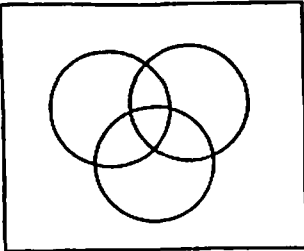
Source	Type of Interaction
Bloom & Broder, 1950 Whimbey, 1975	<p align="center">Paired Partners: Think Aloud</p> 
Description	
A problem solver talks his way strategically through a problem. A partner monitors his progress with cues and questions. Both reflect on problem-solving patterns.	
(Suggested) Prescription	Lesson: Math Problem Solving Level: Grade 6-
Use over time to develop metacognitive, think-aloud tracking of student behaviors.	One partner thinks aloud as he/she solves a problem. The monitor cues the thinking with appropriate questions as the problem solver works systematically through the math calculations.
Notes	Vignette: Paired Partners
Teacher:	<i>With partners, solve this story problem using the think-aloud strategy.</i>
Problem solver: Thinks aloud and says everything that occurs to him/her in a systematic procedure.	<i>I'm going to add these two numbers. Then, I'll . . .</i>
Monitor: Asks leading questions to elicit the inner reasoning.	<i>Why are you doing that? Are you expecting a larger number or a smaller number than the original?</i>
Problem solver: Elaborates and catches another thought for a new strategy.	<i>Because the question calls for a total, I'm thinking the number, of course, will be larger and therefore I will add or multiply. Hmm, could I multiply here?</i>

page 490 For party & Bellanca (1992)

MODEL #7

Source	Type of Interaction
Fogarty & Opeka, 1988	2-4-8: Tell/Retell 
Description	
Partners tell their own stories. Then they retell a partner's story. The pairs double—2-4-8.	
(Suggested) Prescription	Lesson: Show and Tell Level: Grade 1
Use to structure active listening in a partner sharing or for a quick gathering of lots of ideas.	In a typical primary classroom, "show and tell" time is structured carefully for both speaking and listening skills.
Notes	Vignette: 2-4-8
<p>2</p> <p>Partners share show and tell items.</p> 	<p>A: <i>This is my skin from a snake. I found it on the hiking path. It was there in the sunshine. I think the snake wiggled out of it while he was getting a suntan.</i></p> <p>B: <i>I brought my favorite Transformer®. My dad couldn't figure it out. I had to help him. It's pretty tricky if you don't know much about them.</i></p>
<p>4</p> <p>A tells B's, B tells A's C tells D's, D tells C's</p> 	<p>A: <i>"B" brought the Transformer® that his dad couldn't figure out.</i></p> <p>B: <i>"A" found a snake's skin while he was hiking.</i></p> <p>C: <i>"D" brought photographs of his birthday party at the pizza place.</i></p> <p>D: <i>"C" forgot her show and tell but she told me about her ride in the row boat.</i></p>
<p>8</p> <p>Each tells a new story.</p> 	<p>A: <i>"C" forgot hers but she rode in a row boat.</i></p> <p>B: <i>"D" has pictures of the pizza place.</i></p> <p>C: <i>"B" can transform his Transformer®.</i></p> <p>D: <i>"A" has the skin of a snake.</i></p>

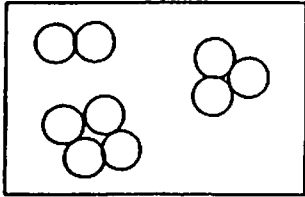
MODEL #8

Source	Type of Interaction
Johnsons, 1986 Slavin, 1983 Kagan, 1988	Cooperative Learning: Groups 
Description	
Three to five learners, heterogeneously grouped for an academic task. Key elements for formal cooperative groups include positive interdependence, individual accountability, group processing, social skills and face-to-face interactions.	
(Suggested) Prescription	Lesson: Prediction (BET) Level: Grade 7
Use to engage students intensely in the processing activities needed for learning for transfer.	Cooperative groups are used in a Directed Reading Thinking Activity (DRTA) to predict and justify what students think will happen next in a story.
Notes	Vignette: Cooperative Learning: Groups
<p>Checker checks for understanding:</p> <p>Teacher monitors</p> <p>Encourager:</p> <p>Teacher monitors</p> <p>Encourager:</p> <p>Group consensus</p> <p>Recorder:</p>	<p><i>Does everyone understand? We will use BET.</i></p> <p>Base on facts Express possibilities Tender a bet on what we think will happen next in the story entitled "The Dinner Party."</p> <p>Encourages response in turn: • <i>I think it's a murder mystery because of the title.</i> • <i>I think it's about cannibals. There will be a twist.</i> • <i>Maybe it's about animals having a tea party. This is from school, you know.</i></p> <p><i>Let's write down the cannibal idea because it's so different. What do the rest of you think?</i></p> <p>Writes down group answer.</p>

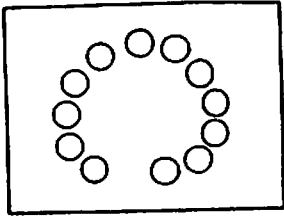
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Fogarty & Bellanca (1992)

MODEL #9

Source	Type of Interaction	
Fogarty & Bellanca, 1987	Traveling Clusters: People Search	
Description		
Students are prompted with questions to move about and find someone who . . . Informal clusters form as students select new partners in their search for answers to the questions.		
(Suggested) Prescription	Lesson: People Search	Level: Grade 12
Use as ice-breaker, as pre-learning strategy to activate prior knowledge or as a review of important concepts prior to a test.	A lesson used as a pre-learning strategy to "stir up" prior knowledge about thinking skills. The cue sheet starts the student interaction.	
Notes	Vignette: People Search	
Prompted by sheet	Using:	<div style="border: 1px solid black; padding: 5px;"> FIND SOMEONE WHO... 1. Can classify friends 2. Can name problem-solving steps 3. 4. 5. </div>
Students move about and talk to each other.	Student A: <i>I think I can classify friends into four groups.</i> Student B: <i>Great. Go ahead.</i> Student A: <i>The good, the bad, the ugly and best friend.</i> Student B: <i>Super. Maybe, I can help you with the steps to problem solving. First, decide on the real problem...</i>	
Students move on to newly forming clusters of 2, 3 or 4 students	Student A: <i>Thanks. Talk to you later.</i>	

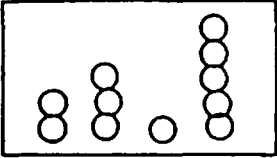
MODEL #10

Source	Type of Interaction	
Howe & Howe, 1975	Forced Response: Wrap Around	
Description		
Round-robin style, students respond in turn to a lead-in statement cued by the teacher.		
(Suggested) Prescription	Lesson: Analogies	Level: Grade 5
Use to anchor individual thoughts or give a quick reading of the group.	At the close of the lesson, students are asked to compare thinking to an animal. After jotting down some ideas, a verbal wrap around the room is used to share the ideas.	
Notes	Vignette: Wrap Around	
Wrapping around the room, each student responds in turn...		
Response of student #1	<i>Thinking is like a frog because it hops around in your mind.</i>	
Teacher	[Signals next student without judging each response.]	
Student #2	<i>Thinking is like an elephant, because it's heavy on your mind.</i>	
Teacher	[Nods.]	
Student #3	<i>Thinking is like a horse, because both can throw you.</i>	
Student #4	<i>Thinking is like the cat family because it helps to be in a group.</i>	
Student #5	<i>Thinking is like a monkey because you can fool around with both.</i>	
Student #6	<i>Thinking is like a chicken, because both can lay an egg!</i>	
etc.		

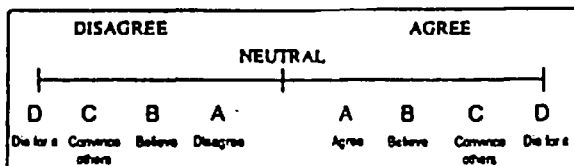
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Ennals & Pollara (1992)

MODEL #11

Source	Type of Interaction	
Fogarty & Bellanca, 1987	Total Group Response: Human Graph	
Description		
Students advocate an opinion by standing at designated spots on an imaginary axis. This human graph is a living, breathing graph that can change as students change positions.		
(Suggested) Prescription	Lesson: Equity	Level: Grade 9
Use to take a quick but highly visible reading of the group members' feelings on an issue, idea or concept.	Used to introduce a unit on Equity Issues, the teacher structures an agree/disagree statement for sampling "public opinion."	
Notes	Vignette: Human Graph	

Present graph format

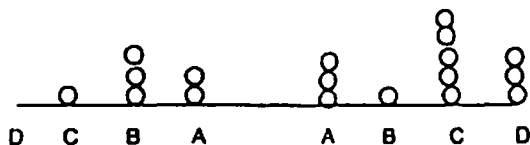


Teacher cues for graphing interaction:

Indicate how strongly you agree or disagree:

Women are stronger than men.

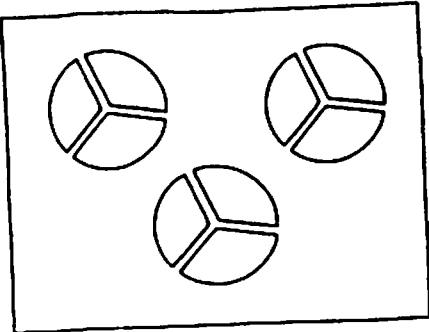
Students move on graph



Sample reasons from students

I agree strongly. Think about the pioneer women and the hardships they had to overcome.

MODEL #12

Source	Type of Interaction	
Aronson, 1978 Sharan and Sharan, 1976	Group Investigation: The Ultimate Jigsaw	
Description		
Each member has a piece of the puzzle; responsibility is divided; to get the whole picture, or all the information, the separate pieces must be reassembled or synthesized into the completed puzzle by the various group members		
(Suggested) Prescription	Lesson: Geographic Regions	Level: Grade 4
Use when groups are socially sophisticated or to build individual responsibility within the team.	In a fourth grade classroom, groups of three students are given regions of the U.S. to investigate and research. The group is ultimately responsible to know all three regions and will "teach each other." Students with the same topic help each other master it before presenting it to their groups.	
Notes	Vignette: The Ultimate Jigsaw	
Teacher	<i>Ones, take the Eastern seaboard. Twos, research the mid-section of the country. Threes, gather information about the western portion of the United States.</i>	
Student #1	<i>I'm going to start in the library.</i>	
Student #2	<i>I need to define my area.</i>	
Student #3	<i>This is great. I love the West.</i>	

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Fogarty & Bellanca (1992)

CLASSROOM STRUCTURES WHICH ENCOURAGE STUDENT PARTICIPATION

METHOD	DEFINITION	WHEN USED	PREPARATION/PROCEDURE	LIMITATION
Group Discussion.	Opportunity for pooling of ideas, experience, and knowledge.	For majority of meetings because of adaptability to greater group participation.	Preplanning to develop discussion outline. Leader encourages every member to participate by guiding the discussion.	Practical with not more than twenty persons. Becomes disorganized without careful planning of material to be covered.
Buzz Groups.	Allows for total participation by group members through small clusters of participants, followed by discussion of the entire group.	As a technique to get participation from every individual in the group. Highly adaptable to other group methods.	Prepare one or two questions on the subject to give each group. Divide the members into small clusters of four to six. A leader is chosen to record and report pertinent ideas discussed.	Thought must be given as to the purpose and organization of groups.
Panel Discussion.	A discussion in a conversational form among a selected group of persons with a leader, in front of an audience that joins in later.	As a technique to stimulate interest and thinking, and to provoke better discussion.	The leader plans with the four to eight members of the panel. The panel discusses informally without any set speeches. The leader then opens the discussion to the entire group and summarizes.	Can get off beam; personality of speakers may overshadow content; vocal speaker can monopolize program.
Symposium Discussion.	A discussion in which the topic is broken into its various phases; each part is presented by an expert or person well informed on that particular phase, in a brief, concise speech.	When specific information is desired.	Leader meets with the three or four members of the symposium and plans outline. Participants are introduced and reports are given, group directs questions to proper symposium members, leader summarizes.	Can get off beam; personality of speakers may overshadow content; vocal speaker can monopolize program.

IU Teaching Resources Center
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TEACHING RESOURCES CENTER
 BALLANTINE HALL

METHOD	DEFINITION	WHEN USED	PREPARATION/PROCEDURE	LIMITATION
Debate Discussion.	A pro and con discussion of a controversial issue. Objective is to convince the audience rather than display skill in attacking the opponent.	In discussing a controversial issue on which there are fairly definite opinions in the group on both sides to bring these differences out into the open in a friendly manner.	Divide the group into sides of pro and con. Each speaker should be limited to a predetermined time followed by rebuttal if desired.	Members are often not objective towards the subject.
Experience Discussion.	A small or large group discussion following a report on the main point of a book, article, movie, or life experience.	To present a new point of view or to present issues that will stimulate thought and discussion.	Plan with others participating on how review is to be presented. Then have an open discussion on pertinent issues and points of view as experienced.	Ability of participating members to relate to others and motivate thinking.
Concentric Circle.	A small circle of group members form within the larger circle. The inner circle discusses a topic while the role of the outside circle is to listen. The discussion is then reversed.	As a technique to stimulate interest and to provoke good discussion. This is especially good to get more response from a group that is slow in participating.	Leader and planning group work out questions that will be discussed by the concentric circle and then by the larger circle.	Much thought and preparation must be given to the questions for discussion. Room and movable chairs needed.
Reaction Sheet.	A method of reacting to ideas in the following ways: Ideas that you question; Ideas that are new to you; Ideas that really "hit home."	As a way to get the group to react. Combine this with other methods.	Prepare topic and reaction sheets. Explain and distribute reaction sheets with the instructions to write as they listen, watch, or read. Follow with group discussion.	Topic should be somewhat controversial.

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METHOD	DEFINITION	WHEN USED	PREPARATION/PROCEDURE	LIMITATION
Phillips 66.	This is a spontaneous method where six people view their opinions on a topic for six minutes.	To add spice and variety to methods of presentations.	Define topic of discussion. Count off six people and allow six minutes for discussion. Allow for group discussion or reassignment of six people.	Must be used somewhat flexibly.
Reverse Thinking.	Expression of thought by thinking in reverse.	To gain an insight into others' feelings and to see another point of view	Prepare topic—explain to group the theory of reverse thinking. Combine with other methods.	A challenge to group members.
Role Playing.	The spontaneous acting out of a situation or an incident by selected members of the group.	As the basis of developing clearer insights into the feelings of people and the forces in a situation which facilitate or block good human relations.	Choose an appropriate situation or problem. Have the group define the roles—the general characteristics to be represented by each player. Enact the scene. Observe and discuss such things as specific behavior, underlying forces, or emotional reactions.	Group leader must be skilled so that actors will play their roles seriously, without self-consciousness.
Picture Making.	A way of bringing out ideas or principles on a topic by means of simple illustrations made by group members on the blackboard or large chart paper.	As a technique to stimulate interest, thinking, and participation.	Leader and members of planning group select general principles or questions on the topic which would be suitable to illustrate. Leader divides the group into four or five sub-groups. Each sub-group is given a statement or problem to illustrate. After completing the picture making, each group shows and explains the picture. This is followed by discussion.	Instruction must be clear as to the value of picture making and adequate materials supplied.

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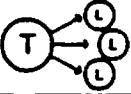


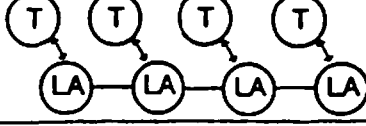

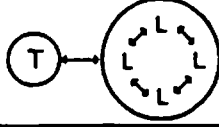
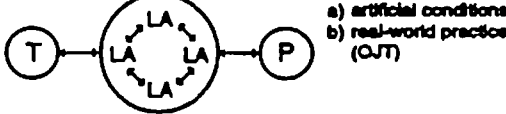
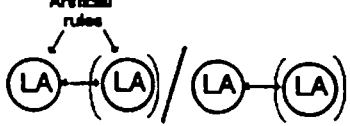
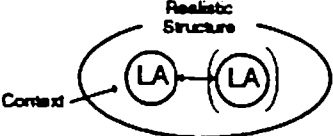



Table 2. Mid-level Strategies (from Dorsey, Olson, & Reigeluth, 1988).

<p>Apprenticeship: an experiential learning strategy in which the learner acquires knowledge and skills through direct participation in learning under immediate personal supervision in a situation that approximates the conditions under which the knowledge will be used.</p> <p>Debate: a formally structured discussion with two teams arguing opposing sides of a topic.</p> <p>Demonstration: a carefully prepared presentation that shows how to perform an act or use a procedure; accompanied by appropriate oral and visual explanations and illustrations; frequently accompanied by questions.</p> <p>Field trip: a carefully planned educational tour in which a group visits an object or place of interest for first-hand observation or study.</p> <p>Game: an instructional activity in which participants follow prescribed rules that differ from those of reality as they strive to attain a challenging goal; is usually competitive.</p> <p>Group discussion, guided: a purposeful conversation and deliberation about a topic of mutual interest among 6–20 participants under the guidance of a leader.</p> <p>Group discussion, free/open: a free group discussion of a topic selected by the teacher, who acts only as chairman; learning occurs only through the interchange among group members.</p> <p>Ancient symposium: a group of 5–29 persons who meet in the home or private room to enjoy good food, entertainment, fellowship, and with the desire to discuss informally a topic of mutual interest.</p> <p>Interview: a 5- to 30-minute presentation conducted before an audience in which a resource person(s) responds to systematic questioning by the audience about a previously determined topic.</p> <p>Laboratory: a learning experience in which students interact with raw materials.</p> <p>Guided laboratory: an instructor-guided learning experience in which students interact with raw materials.</p> <p>Lecture/Speech: a carefully prepared oral presentation of a subject by a qualified person.</p> <p>Lecture, guided discovery: a group learning strategy in which the audience responds to questions posed by the instructor selected to guide them toward discovery (also called recitation class).</p> <p>Panel discussion: a group of 3–6 persons having a purposeful conversation on an assigned topic before an audience of learners; members are selected on the basis</p>	<p>of previously demonstrated interests and competency in the subject to be discussed and their ability to verbalize.</p> <p>Project: an organized task performance or problem solving activity.</p> <p>Team project: a small group of learners working cooperatively to perform a task or solve a problem.</p> <p>Seminar: a strategy in which one or several group members carry out a study/project on a topic (usually selected by the teacher) and present their findings to the rest of the group, followed by discussion (usually teacher-led) of the findings to reach a general conclusion.</p> <p>Quiet meeting: a 15- to 60-minute period of meditation and limited verbal expression by a group of five or more persons; requires a group of people who are not strangers to each other; is used at a point when the leaders or members feel that reflection and contemplation are desirable.</p> <p>Simulation: an abstraction or simplification of some specific real-life situation, process, or task.</p> <p>Case study: a type of simulation aimed at giving learners experience in the sort of decision making required later.</p> <p>Role play: a dramatized case study; a spontaneous portrayal (acting out) of a situation, condition, or circumstance by elected members of a learning group.</p> <p>Think Tank/Brainstorm: a group effort to generate new ideas for creative problem solving; thoughts of one participant stimulate new direction and thoughts in another.</p> <p>Tutorial, programmed: one-to-one method of instruction in which decisions to be made by the tutor (live, text, computer, or expert system) are programmed in advance by means of carefully selected, structured instructions; is individually paced, requires active learner response, and provides immediate feedback.</p> <p>Tutorial, conversational: one-to-one method of instruction in which the tutor presents instruction in an adaptive mode; is individually paced, requires active learner response, and feedback is provided.</p> <p>Socratic dialogue: a type of conversational tutorial in which the tutor guides the learner to discovery through a series of questions.</p> <p>Note: There are many variations of these approaches, and different approaches are often used in combination.</p>
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(often called "performance technology") and societal impact (see, e.g., the "Business Impact ISD Model" proposed by Molenda, Pershing and Reigeluth (in press). For K–12 and higher education, greater attention will be paid to the needs of the broader community or society (and its various organizations) that the

educational institution serves, as well as to the learners' needs; and greater attention will be paid to organizational changes that will help the institution and its instructional system to meet those needs. The concern for systemic change in education, or Educational Systems Design (ESD), is a reflection of the

Table 3. Alternative Methods for Instruction (from Molenda, 1995).

Methods:		Strengths:
Lecture/Presentation	(telling) 	Efficient Standardized Structured
Demonstration/Modeling		Eases Application
Tutorial		Customized Learner Responsible
Drill & Practice		Automatized Mastery
Independent/Learner Control		Flexible implementation
Discussion, Seminar		Meaningful, realism, owned, customized to learner
Cooperative Group Learning		Ownership Team-building
Games (artificial rules)		High Transfer High Motivation
Simulations		
Discovery • Individual		
• Group		
Problem Solving/Lab		High Level Thinking in ill-structured problems







 = Teacher (Live or Automated)
  = Learner
  = Resource (Instructional)
 - - = Indirect involvement
 = Problem
  = Learning Activity
  = Resource (raw)
 > = Direction of Control

Fig. 4. Overview of Selected Structures

Structure	Brief Description	Functions Academic & Social
Teambuilding		
Roundrobin	Each student in turn shares something with his or her teammates.	Expressing ideas and opinions, creation of stories. <i>Equal participation, getting acquainted with teammates.</i>
Classbuilding		
Corners	Each student moves to a corner of the room representing a teacher-determined alternative. Students discuss within corners, then listen to and paraphrase ideas from other corners.	Seeing alternative hypotheses, values, problem-solving approaches. <i>Knowing and respecting different points of view, meeting classmates.</i>
Communication Building		
Match Mine	Students attempt to match the arrangement of objects on a grid of another student using oral communication only.	Vocabulary development. <i>Communication skills, role-taking ability.</i>
Mastery		
Numbered Heads Together	The teacher asks a question, students consult to make sure everyone knows the answer, then one student is called upon to answer.	Review, checking for knowledge, comprehension. <i>Tutoring.</i>
Color-Coded Co-op Cards	Students memorize facts using a flash card game. The game is structured so that there is a maximum probability of success at each step, moving from short-term to long-term memory. Scoring is based on improvement.	Memorizing facts. <i>Helping, praising.</i>
Pairs Check	Students work in pairs within groups of four. Within pairs students alternate—one solves a problem while the other coaches. After every two problems the pair checks to see if they have the same answers as the other pair.	Practicing skills. <i>Helping, praising.</i>
Concept Development		
Three-Step Interview	Students interview each other in pairs, first one way, then the other. Students each share with the group information they learned in the interview.	Sharing personal information such as hypotheses, reactions to a poem, conclusions from a unit. <i>Participation, listening.</i>
Think-Pair-Share	Students think to themselves on a topic provided by the teacher; they pair up with another student to discuss it; they then share their thoughts with the class.	Generating and revising hypotheses, inductive reasoning, deductive reasoning, application. <i>Participation, involvement.</i>
Team Word-Webbing	Students write simultaneously on a piece of chart paper, drawing main concepts, supporting elements, and bridges representing the relation of ideas in a concept.	Analysis of concepts into components, understanding multiple relations among ideas; differentiating concepts. <i>Role-taking.</i>
Multifunctional		
Roundtable	Each student in turn writes one answer as a paper and a pencil are passed around the group. With Simultaneous Roundtable more than one pencil and paper are used at once.	Assessing prior knowledge, practicing skills, recalling information, creating cooperative art. <i>Team-building, participation of all.</i>
Inside-Outside Circle	Students stand in pairs in two concentric circles. The inside circle faces out; the outside circle faces in. Students use flash cards or respond to teacher questions as they rotate to each new partner.	Checking for understanding, review, processing, helping. <i>Tutoring, sharing, meeting classmates.</i>
Partners	Students work in pairs to create or master content. They consult with partners from other teams. They then share their products or understanding with the other partner pair in their team.	Mastery and presentation of new material, concept development. <i>Presentation and communication skills.</i>
Jigsaw	Each student on the team becomes an "expert" on one topic by working with members from other teams assigned the corresponding expert topic. Upon returning to their teams, each one in turn teaches the group; and students are all assessed on all aspects of the topic.	Acquisition and presentation of new material, review, informed debate. <i>Interdependence, status equalization.</i>
Co-op Co-op	Students work in groups to produce a particular group product to share with the whole class; each student makes a particular contribution to the group.	Learning and sharing com- material, open with

SELECTED CATs FOR GETTING FEEDBACK ON STUDENT LEARNING AND RESPONSE TO TEACHING ¹

Name:	Description:	What to do with the data:	Time required:
Minute paper. ³	During the last few minutes of the class period, ask students to answer on a half-sheet of paper: "What is the most important point you learned today?" and, "What point remains least clear to you?". The purpose is to elicit data about students' comprehension of a particular class session.	Review responses and note any useful comments. During the next class periods emphasize the issues illuminated by your students' comments.	Prep: Low In class: Low Analysis: Low
Show me your notes	Periodically, ask a few randomly-chosen students to photocopy their class notes and anonymously send them to you so that you can see if students are grasping the overall structure and your main points.	Using your class objectives as a benchmark, study the notes from one day and observe consistencies and differences between your objectives and those recorded and highlighted by your students. Adjust accordingly.	Prep: Low In class: Low Analysis: Low
Memory matrix	Students fill in cells of a two-dimensional diagram for which instructor has provided labels. For example, in a music course, labels might consist of periods (Baroque, Classical) by countries (Germany, France, Britain); students enter composers in cells to demonstrate their ability to remember and classify key concepts.	Tally the numbers of correct and incorrect responses in each cell. Analyze differences both between and among the cells. Look for patterns among the incorrect responses and decide what might be the cause(s).	Prep: Medium In class: Medium Analysis: Medium
Directed paraphrasing	Ask students to write a layman's "translation" of something they have just learned -- geared to a specified individual or audience -- to assess their ability to comprehend and transfer concepts.	Categorize student responses according to characteristics you feel are important. Analyze the responses both within and across categories, noting ways you could address student needs.	Prep: Low In class: Medium Analysis: Medium
One-sentence summary	Students summarize knowledge of a topic by constructing a single sentence that answers the questions "Who does what to whom, when, where, how, and why?" The purpose is to require students to select only the defining features of an idea.	Evaluate the quality of each summary quickly and holistically. Note whether students have identified the essential concepts of the class topic and their interrelationships. Share your observations with your students.	Prep: Low In class: Medium Analysis: Medium
Word Journal	Students summarize their response to a short text or presentation with a single word, then write a paragraph explaining why they chose that word. This activity helps students to analyze and evaluate their own thinking on the topic.	Tally the words that are used by more than one student. Note the justifications your students give for their selections. Categorize word journals by both selected words and explanations. Share the pattern of results with your students.	Prep: Low In class: Medium Analysis: High
Application cards	After teaching about an important theory, principle, or procedure, ask students to write down at least one real-world application for what they have just learned to determine how well they can transfer their learning.	Quickly read once through the applications and categorize them according to their quality. Pick out a broad range of examples and present them to the class.	Prep: Low In class: Low Analysis: Medium
Student-generated test questions	Allow students to write test questions and model answers for specified topics, in a format consistent with course exams. This will give students the opportunity to evaluate the course topics, reflect on what they understand, and what are good test items.	Make a rough tally of the questions your students propose and the topics that they cover. Evaluate the questions and use the goods ones as prompts for discussion. You may also want to revise the questions and use them on the upcoming exam.	Prep: Medium In class: High Analysis: High (may be homework)

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¹Details on these and others available from Angelo & Cross, Classroom Assessment Techniques, 1993

WHAT IS CLASSROOM ASSESSMENT?

Classroom assessment is both a teaching approach and a set of techniques. The approach is that the more you know about what and how students are learning, the better you can plan learning activities to structure your teaching. The techniques are mostly simple, non-graded, anonymous, in-class activities that give both you and your students useful feedback on the teaching-learning process.

HOW IS CLASSROOM ASSESSMENT DIFFERENT?

Classroom assessment differs from tests and other forms of student assessment in that it is aimed at course improvement, rather than at assigning grades. The primary goal is to better understand your students' learning and so to improve your teaching.

HOW DO I USE CLASSROOM ASSESSMENT TECHNIQUES?

- Decide what you want to learn from a classroom assessment.
- Choose a Classroom Assessment Technique (CAT) that provides this feedback, is consistent with your teaching style, and can be easily implemented in your class.
- Explain the purpose of the activity to students, then conduct it.
- After class, review the results and decide what changes, if any, to make.
- Let your students know what you learned from the CAT and how you will use this information.

WHY SHOULD I USE CATs?

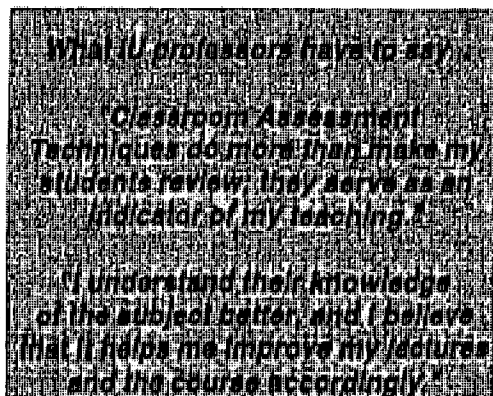
For faculty, more frequent use of CATs can:

- Provide short-term feedback about the day-to-day learning and teaching process at a time when it is still possible to make mid-course corrections.
- Provide useful information about student learning with a much lower investment of time compared to tests, papers, and other traditional means of learning assessment.
- Help to foster good rapport with students and increase the efficacy of teaching and learning.
- Encourage the view that teaching is a formative process that evolves over time with feedback.

For students, more frequent use of CATs can:

- Help them become better monitors of their own learning.
- Help break down feelings of anonymity, especially in larger courses.
- Point out the need to alter study skills.
- Provide concrete evidence that the instructor cares about learning.

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WHAT RESOURCES ARE AVAILABLE?

The following IUB instructional development staff would be glad to assist you in choosing, implementing, or analyzing classroom assessment techniques:

College of Arts and Sciences: Alan Kalish (e-mail KALISH), Teaching Resources Center, Ballantine 132, 5-2635

School of Business: Melissa Carter-Goodrum (MCARTERG) or Gipsi Sera (SERAG), Technology Services, Business 131, 5-4247

School of Education: Karen Hallett (HALLETT), Instructional Consulting & Media Services, Education 2002, 6-8408

All other schools: Janet Donley (JDONLEY) or David Perry (PERRY1), Instructional Consulting & Technology, Franklin Hall 004, 5-9023

Assessment of Instructional technologies: David Goodrum (GOODRUM) or Gail Rathbun (GRATHBUN), Instructional Consulting & Technology, Franklin Hall 004, 5-9023

Published Resources:

Angelo, T.A. & Cross, P.K. (1993). *Classroom Assessment Techniques* (2nd ed.). San Francisco: Jossey-Bass.

Davis, B.G. (1993). *Tools for Teaching*. San Francisco: Jossey-Bass.

Classroom Assessment Techniques

Simple techniques for finding out how your teaching affects student learning

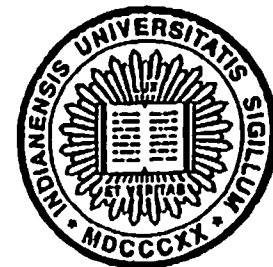


CHART OF STRUCTURES

Chapter 8: Teambuilding

4S Brainstorming 8:10
 Fact-or-Fiction 8: 4
 Flashcard Game 8: 3
 Formations 8: 4
 Guess-the-Fib 8: 4
 Roundrobin 8: 3
 Roundtable 8: 9
 Send-A-Problem 8:10
 Structured Sort 8: 4
 Team Interview 8: 2
 Team Projects 8: 3
 Turn Toss 8: 2
 Value Lines 8:11

Chapter 9: Classbuilding

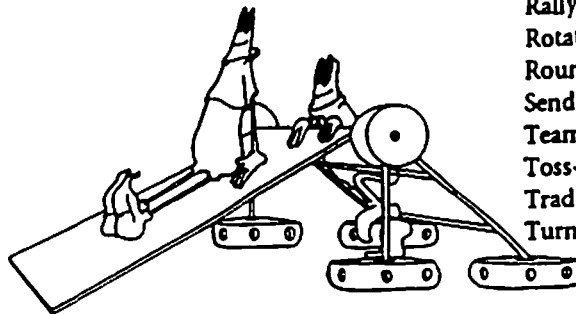
Class Projects 9: 7
 Corners 9: 8
 Fact Bingo 9: 7
 Fact-or-Fiction 9: 7
 Find-Someone-Who... 9: 4
 Formations 9:11
 Guess-the-Fib 9: 7
 Inside-Outside Circle 9: 6
 Line-Ups 9: 6
 Linkages 9: 6
 Mix-Freeze-Group 9:10
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 Sequencing 11: 6
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 Send-A-Problem 10:11
 Team Test Taking 10:12
 Toss-A-Question 10:13
 Trade-A-Problem 10:12
 Turn-4-Review 10:16



Chapter 13: Communication Skills

I. Communication Regulators

Affirmation Chips 13:2
 Colored Chips 13:1
 Freebies 13:2
 Gambit Chips 13:2
 Paraphrase Passport 13:2
 Response Mode Chips 13:2
 Talking Chips 13:1
 Timed Turns 13:2
 Yarn Yarn 13:2

II. Decision Makers

Consensus Seeking 13:5
 Proactive Prioritizing 13:6
 Spend-A-Buck 13:5
 Voting 13:5

III. Communication Builders

Act-What-I-Write 13:10
 Broken Squares 13:19
 Class Value Lines 13: 7
 Color-What-I-Say 13:10
 Draw-What-I-Say 13: 9
 Estimate Lines 13: 8
 Find-What-I-Write 13:10
 Match Mine 13:16
 Match Mind 13:16
 Pin A Place 13: 9
 Split Value Lines 13: 8
 Same-Different 13:10
 Team Value Lines 13: 6
 Value Lines 13: 6

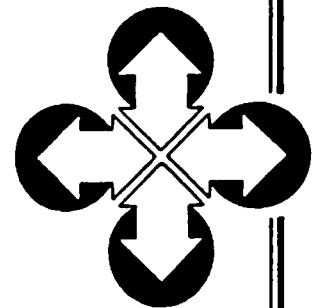
Chapter 12: Information Sharing

I. Among Teammates

Four-Step Interview 12:4
 Roundrobin 12:1
 Rallyrobin 12:1
 Six-Step Interview 12:4
 Team Interview 12:2
 Three-Step Interview .. 12:2

II. Among Teams

Blackboard Share 12:5
 Carbon Sharing 12:5
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 Gallery Tour 12:5
 One Stray, Three Stay ... 12:6
 Roam the Room 12:5
 Rotating Review 12:6
 Roving Reporters 12:6
 Share and Compare 12:5
 Stand & Share 12:5
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 Team Notebooks 12:5
 Three Stray, One Stay 12:6



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 Kagan (1992)

CHART OF LESSON DESIGNS

Chapter 17: Mastery Designs

Color-Coded Co-op

Cards 17:1

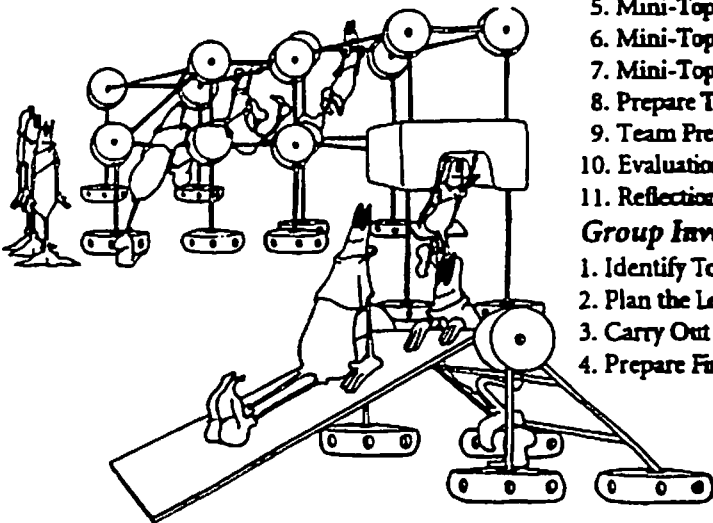
1. Pre-Test
2. Create Cards
3. Flashcard Game
4. Practice Test
5. Count Improvement Points
6. Flashcard Game
7. Final Test
8. Final Improvement Scoring
9. Individual, Team & Class Recognition
10. Reflection

STAD 17:6

1. Direct Instruction
2. Group Work for Practice
3. Individual Quiz
4. Improvement Scoring
5. Team Recognition

TGT 17:10

(Same as STAD except Tournament replaces Quiz, and points are based on out scoring others.)



Chapter 18: Division of Labor Designs

Telephone 18:1 Partners 18:1

1. A Student Exits Room
2. Remaining Students Instructed
3. Student Returns
4. Returnee Instructed by Teammates
5. Returnee Tested

1. Form Partners Within Teams
2. Class Division
3. Materials Distributed
4. Partners Work
5. Partners Consult
6. Partners Prepare to Present
7. Teams Reunite
8. Partners Present & Tutor
9. Reflection
10. Individual Assessment

Jigsaw II 18:15

1. Direct Instruction
2. Expert Topics Assigned
3. Expert Group Work
4. Experts Teach Teammates
5. Individual Quiz
6. Improvement Scoring
7. Team Recognition

Chapter 19: Project Designs

Co-op Co-op 19:1

1. Class Discussion
2. Team Selection
3. Teambuilding/Social Skill
4. Team Topic Selection
5. Mini-Topic Selection
6. Mini-Topic Preparation
7. Mini-Topic Presentation
8. Prepare Team Presentation
9. Team Presentations
10. Evaluation
11. Reflection

Co-op Jigsaw 19:10

1. Expert Topics Assigned
2. Expert Group Work
3. Experts Return, Share, Tutor
4. Prepare Team Presentation
5. Team Presentations
6. Check for Connections
7. Evaluation
8. Reflection

Rotation Learning

Centers 19:16

1. Monday: Input
2. Tuesday: 1st Learning Center
3. Wednesday: 2nd Learning Center
4. Thursday: 3rd Learning Center
5. Friday: Integration & Assessment

Group Investigation 19:10

1. Identify Topic; Team Selection
2. Plan the Learning Task
3. Carry Out Investigation
4. Prepare Final Report

Chapter 20: Multi-Functional Frameworks

Effective

Instruction 20:3

1. Anticipatory Set
2. Instructional Input
3. Check Understanding
4. Guided Practice
5. Closure
6. Independent Practice

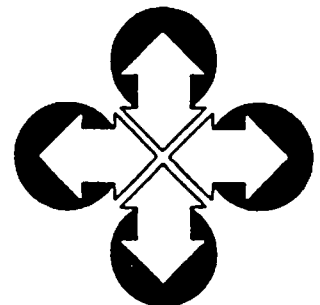
Johnson &

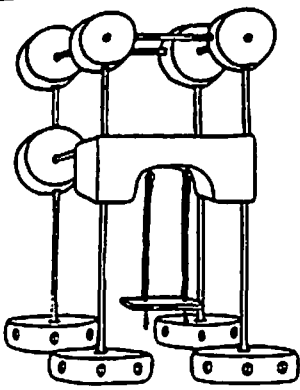
Johnson 5:9

1. Direct Instruction of Content
2. Teach Social Skills
3. Students Work in Groups
4. Teacher Observes for Social Skills & Content
5. Process Social Skills & Content

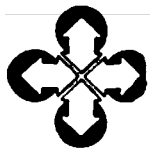
Big Four 20:18

1. Class Building
2. Teambuilding
3. Mastery
4. Thinking Skills



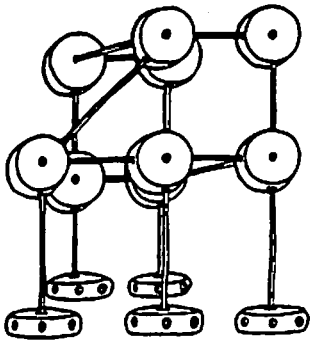


Index of Structures



	Teambuilding	Classbuilding	Mastery	Thinking Skills	Information Sharing	Communication Skills	See Also
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Broken Squares						13: 19	14: 25
Build-What-I-Write				11: 7			
Carbon Sharing					12: 5		
Carousel					12: 6		
Choral Response			10: 16				20: 9, 16, 17
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Guess-the-Fib	8: 4	9: 7	10: 14				
Inside-Outside Circle		9: 6	10: 11		12: 7		6: 10, 14: 13, 20: 9, 14, 15, 16
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Linkages		9: 6					
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Match Mind				11: 11		13: 16	
Match Mine						13: 16	20: 9
Mix-Freeze-Pair		9: 7					

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On-the-Line				11:10			
One & All				11:15			
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Pairs		9:10					14:26
Pairs Check			10:5				14:13, 24, 25, 20:9, 15
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Pin-A-Place						13:9	
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Q-Review			10:15				
Q-Trix				11:17			
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Spend-A-Buck						13:5	21:2
Split Value Lines						13:8	
Stand & Share					12:5		20:9, 15, 16

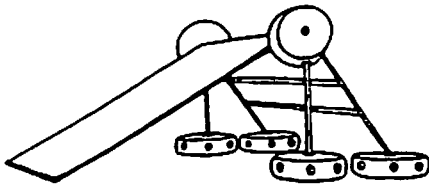
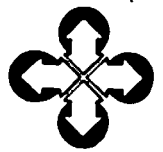
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Kagan (1992)

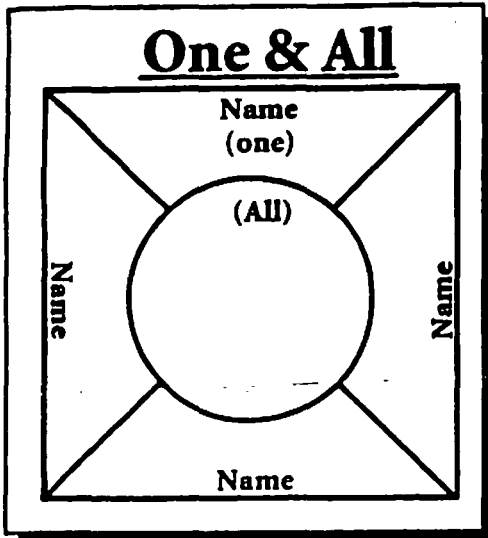
Index of Structures



	Teambuilding	Classbuilding	Mastery	Thinking Skills	Information Sharing	Communication Skills	See Also
Structured Sorts	8: 4			11:14			
Talking Chips						13: 1	14:13, 24, 25, 26, 20: 9, 17
Team Discussion				11: 2			5:3, 15:10, 20: 9, 14, 16
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Who-Am-I?		9:10					20: 9, 20:17
Unstructured Sorts				11:14			
Yarn Yarn						13: 2	
Venn Diagrams				11:10			
Voting						13: 5	

Chapter 11. Thinking Skills Structures

category system, and sorting and resorting according to new category systems can be the stepping off place for a discussion.

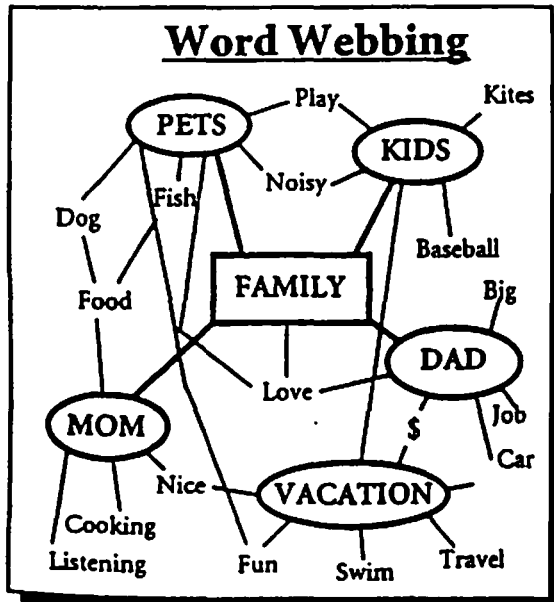


One & All

One & All is a simple framework for discovering similarities and differences, developed by Wayne and Karen Trainor. As a teambuilder, students would place items which are true of all of them in the center and items which are true of one, but not all of them in the outside segments. One & All can be used also for comparing and contrasting books, characters in books, animals, plants, countries, and math factors. See box.

Team Word Webbing

Word-Webbing, Semantic Maps, Clustering, Chains, Spider Maps, and Concept Maps, are a powerful set of tools in concept development and exchange.



Give each student a different color pen or marker. Give the team one larger poster sized piece of butcher paper. Have them write the topic in the center, not too large (in a rectangle), let them do a round of Roundtable on the Core Concepts (in ovals), and then let them free-for-all — each adding Core Concepts, Supporting Elements, as they feel the impulse.

The completed Word-Web provides a natural tool for assessing group functioning. Because each student has written in only one color and the color code is placed at the bottom of the Word Web, it is easy to see the type of contribution made by each team member.

For example, if you observed a core concept written in one color, and all the supporting details also in that one color, and no bridges are made from that concept or it's supporting elements to other concepts, and the color is not found anywhere else on the Word Web, there is a pretty good chance you are dealing with a cognitive and perhaps social isolate. On the other hand, if you find the four colors all over the Word Web, you can bet you have a team whose members relate to each other's ideas. The completed Word Web is also a natural tool for assessing cognitive style. You may find some students who contribute only bridges (Relational Thinkers), others who contribute only core concepts (Global Thinkers), and yet others who write in mostly supporting elements (Analytic Thinkers). You can give all the students a cognitive stretch by having them make up four role cards (Core Concept Captain, Supporting Element Engineer 1, Supporting Element Engineer 2, and Bridge Builder), assigning the roles within teams randomly, and then rotating the roles periodically while the students make the Word Web.

The Core Concept Captain is not allowed to contribute a new core concept unless the team reaches consensus that it truly is a core concept rather than just a supporting element. For example, if we were to do a Word Web on "Cooperative Learning," as a team we would be in trouble if we wrote down "Think-Pair-Share" as a core concept — we would have to make dozens of core concepts. "Think-Pair-Share" is a supporting element in a core concept called "Structures."

Maps and Chains

Semantic Maps, Spider Maps, Chains, and Concept maps all differ from Word Webbs. For more details on various kinds of mapping see (Basin, 1974, Alexander et al, 1983, Stahl & Venezuela, 1986). Wiederhold (1991) provides discussion of Spider Maps, Chains, and Concept maps.

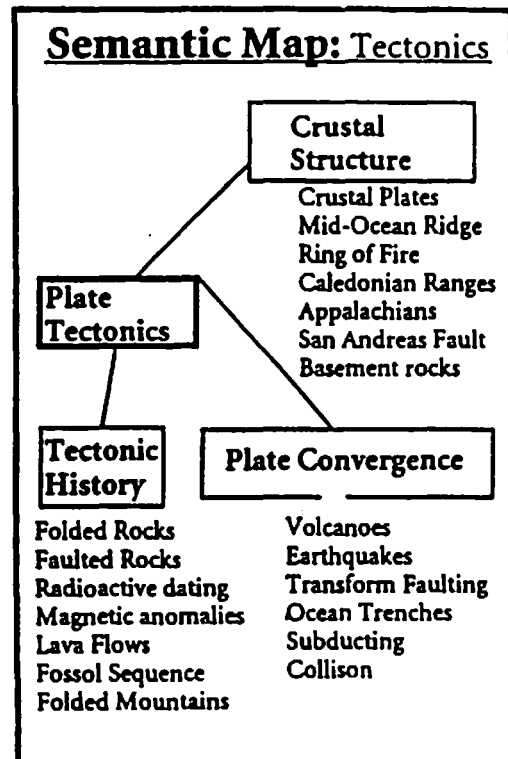
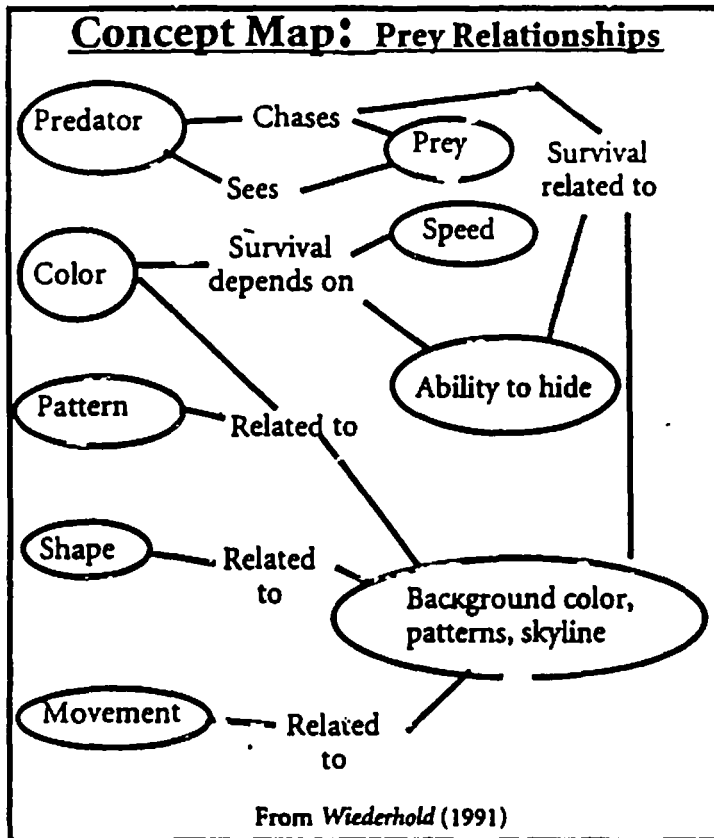
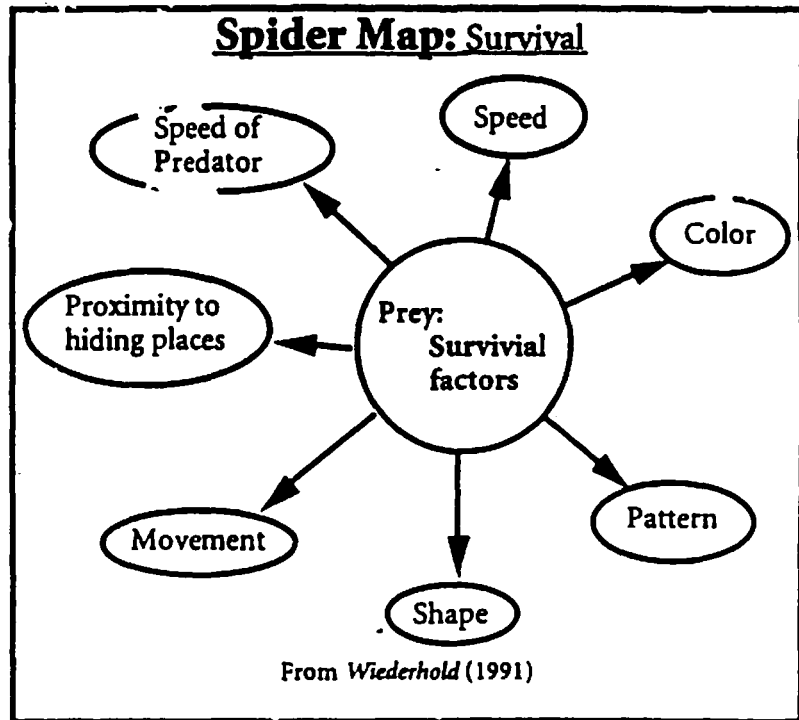
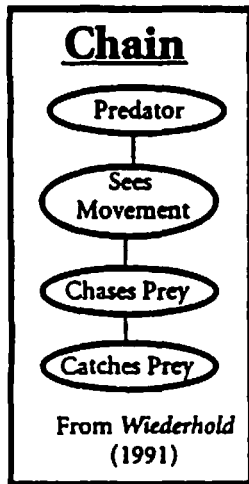
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Kagan (1992)



Cooperative Learning Summary

Benefits of Cooperative Learning

- Affects positively a student's achievement and interpersonal relationships.
- Improves attitudes toward different racial and ethnic groups.
- Helps low-achieving students spend less time off task.
- Involves students more actively in the learning process.
- Helps spot student weaknesses and helps them quicker.
- Creates a more relaxed and comfortable classroom environment.

Norms of Cooperative Behavior

- Everyone has the responsibility to listen carefully and with respect to one another in the group.
- Everyone has the responsibility and the right to contribute to the group task.
- Everyone has the responsibility and the right to ask for help from the group when needed.
- Everyone has the responsibility to help others in the group when asked.
- Do not change your mind unless you are logically persuaded. Reach consensus, not majority rule.

Roles for Cooperative Group Members

- *Facilitator* who keeps the group members focused on the task.
- *Thinker* who generates new ideas.
- *Supporter* saying, "That's a good idea!"
- *Questioner* saying, "Yes, that's a good idea, but what about a case in which . . . ?"
- *Unifier* who combines the ideas presented by group members into a unified idea.

Form Groups

1. Form groups of four when possible, as these work best (five is better than three).
2. Allow students to select their own groups at first.
3. Balance by sex, race, and behavior.
4. Change every six weeks.
5. Rearrange to put one high-achiever and one low-achiever in each group.

Teach Cooperative Group Behavior

1. Explain the norms of cooperative behavior.
2. Delineate the roles for cooperative group members.
3. Practice with cooperative lessons before using the text.

The Teacher's Role

1. Establish objectives.
2. Monitor groups.
3. Refuse to give quick answers.
4. Give praise, encouragement, and recognition for correct behavior.
5. Intervene when necessary.
6. Employ techniques for "forcing" cooperation.

Grading

1. Grade performance on tests and quizzes individually.
2. Give group grades for cooperative processes.
3. Avoid giving group grades for group products.
4. Avoid competition between groups.

MORE/FINAL

ADVICE FOR STARTING OUT
Johnson, Johnson, & Holubec

Start Small and Build

Group size of 2 or 3

Do something cooperative daily

Keep it short: 5 to 10 minutes

Plan carefully!

YOU choose groups

Sell kids on it before starting

DON'T give group grades

Monitor: walk and listen

Praise positive behaviors

Be patient

Be positive

Problem-Solve

Work with a colleague

Rule: No student's grade should be lower because of cooperative learning. Evaluation for learning should be individual until you and the students are ready for group grades - until they are fair. What are some alternatives to giving group grades?

1. _____
2. _____
3. _____
4. _____
5. _____

WHAT'S HAPPENS NEXT?

ASSESSMENT,

SCHOOL RESTRUCTURING,

AND

CREATING

SMARTER

SCHOOLS!!!

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Logical/Mathematical Intelligence

Often called "scientific thinking," this intelligence deals with inductive and deductive thinking/reasoning, numbers and the recognition of abstract patterns.



Verbal/Linguistic Intelligence

This intelligence, which is related to words and language—written and spoken—dominates most Western educational systems.

Visual/Spatial Intelligence

This intelligence, which relies on the sense of sight and being able to visualize an object, includes the ability to create internal mental images/pictures.



Intrapersonal Intelligence

This intelligence relates to inner states of being, self-reflection, metacognition (i.e. thinking about thinking) and awareness of spiritual realities.



MULTIPLE INTELLIGENCES

Body/Kinesthetic Intelligence

This intelligence is related to physical movement and the knowings/wisdom of the body, including the brain's motor cortex, which controls bodily motion.



Interpersonal Intelligence

This intelligence operates primarily through person-to-person relationships and communication.

Musical/Rhythmic Intelligence

This intelligence is based on the recognition of tonal patterns, including various environmental sounds, and on a sensitivity to rhythm and beats.



INTELLECT VALUES IN AMERICAN CULTURES, THE
of cognition across the millennia; and two forms of
psychological evidence—the results of factor-ana-
lytic studies of human cognitive capacities and the

sumably for both hereditary and environmental
reasons—in their current profile of intelligences.
Moreover, there is no necessary correlation between

TABLE 1 The Seven Intelligences

Intelligence	End-States	Core Components
Logical-mathematical	Scientist Mathematician	Sensitivity to, and capacity to discern, logical or numerical patterns; ability to handle long chains of reasoning.
Linguistic	Poet Journalist	Sensitivity to the sounds, rhythms, and meanings of words; sensitivity to the different functions of language
Musical	Composer Violinist	Abilities to produce and appreciate rhythm, pitch, and timbre, appreciation of the forms of musical expressiveness
Spatial	Navigator Sculptor	Capacities to perceive the visual-spatial world accurately and to perform transformations on one's initial perceptions.
Bodily-kinesthetic	Dancer Athlete	Abilities to control one's body movements and to handle objects skillfully.
Interpersonal	Therapist Salesman	Capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people
Intrapersonal	Person with detailed, accurate self-knowledge	Access to one's own feelings and the ability to discriminate among them and draw upon them to guide behavior; knowledge of one's own strengths, weaknesses, desires, and intelligences.

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FIGURE 1.1
MI Theory Summary Chart

Intelligence	Core Components	Symbol Systems	High End-States
Linguistic	Sensitivity to the sounds, structure, meanings, and functions of words and language	Phonetic languages (e.g., English)	Writer, orator (e.g., Virginia Woolf, Martin Luther King, Jr.)
Logical-Mathematical	Sensitivity to, and capacity to discern, logical or numerical patterns; ability to handle long chains of reasoning	Computer languages (e.g., Pascal)	Scientist, mathematician (e.g., Madame Curie, Blaise Pascal)
Spatial	Capacity to perceive the visual-spatial world accurately and to perform transformations on one's initial perceptions	Ideographic languages (e.g., Chinese)	Artist, architect (e.g., Frida Kahlo, I. M. Pei)
Bodily-Kinesthetic	Ability to control one's body movements and to handle objects skillfully	Sign languages, braille	Athlete, dancer, sculptor (e.g., Jesse Owens, Martha Graham, Auguste Rodin)
Musical	Ability to produce and appreciate rhythm, pitch, and timbre; appreciation of the forms of musical expressiveness	Musical notational systems, Morse Code	Composer, performer (e.g., Stevie Wonder, Midori)
Interpersonal	Capacity to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people	Social cues (e.g., gestures and facial expressions)	Counselor, political leader (e.g., Carl Rogers, Nelson Mandela)
Intrapersonal	Access to one's own feeling life and the ability to discriminate among one's emotions; knowledge of one's own strengths and weaknesses	Symbols of the self (e.g., in dreams and artwork)	Psychotherapist, religious leader (e.g., Sigmund Freud, the Buddha)

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Lazarus (1992)

David L. (1995) Talk at Phi Delta Kappa Bloomington, IN SHH at Oaklisking

VERBAL/LINGUISTIC

- Reading
- Vocabulary
- Formal Speech
- Journal/Diary Keeping
- Creative Writing
- Poetry
- Verbal Debate
- Impromptu Speaking
- Humor/Jokes
- Storytelling

LOGICAL/MATHEMATICAL

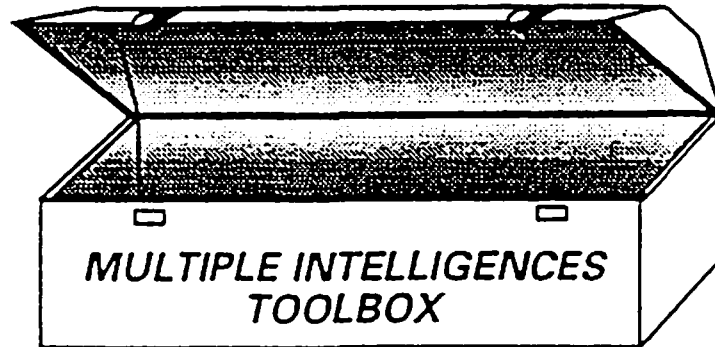
- Abstract Symbols/Formulas
- Outlining
- Graphic Organizers
- Number Sequences
- Calculation
- Deciphering Codes
- Forcing Relationships
- Syllogisms
- Problem Solving
- Pattern Games

VISUAL/SPATIAL

- Visualization
- Active Imagination
- Color Schemes
- Patterns/Designs
- Painting
- Drawing
- Mind-Mapping
- Pretending
- Sculpture
- Visual Pictures

BODY/KINESTHETIC

- Folk/Creative Dance
- Role Playing
- Physical Gestures
- Drama
- Martial Arts
- Body Language
- Physical Exercise
- Mime
- Inventing
- Sports Games



MUSICAL/RHYTHMIC

- Rhythmic Patterns
- Vocal Sounds/Tones
- Music Composition/Creation
- Percussion Vibrations
- Humming
- Environmental Sounds
- Instrumental Sounds
- Singing
- Tonal Patterns
- Music Performance

INTERPERSONAL

- Giving Feedback
- Intuiting Others' Feelings
- Cooperative Learning Strategies
- Person-to-Person Communication
- Empathy Practices
- Division of Labor
- Collaboration Skills
- Receiving Feedback
- Sensing Others' Motives
- Group Projects

INTRAPERSONAL

- Meditation Methods
- Metacognition Techniques
- Thinking Strategies
- Emotional Processing
- "Know Thyself" Procedures
- Mindfulness Practices
- Focusing/Concentration Skills
- Higher-Order Reasoning
- Complex Guided Imagery
- "Centering" Practices

■ A logical/mathematical component could include having students use *graphic organizers* to analyze different processes (e.g., a Venn diagram to compare/contrast adding and subtracting); they could think of *problem-solving scenarios* from everyday life requiring an understanding of fractions (e.g., cutting a pizza to serve all at your table); or they could create fractions adding and subtracting (*pattern game*).

■ A visual/spatial component could include having students work with sculpture, various manipulatives for adding and subtracting parts of wholes; they could solve a page of fraction problems by *drawing* or *painting* their answers; or you could teach them *active imagination* processes for seeing the operations in action.

audit or oversight policies to ensure that the rights were protected. Here is my rough draft of such a set of rights:

Assessment Bill of Rights

All students are entitled to the following:

1. Worthwhile (engaging, educative, and "authentic") intellectual problems that are validated against worthy "real-world" intellectual problems, roles, and situations
2. Clear, apt, published, and consistently applied teacher criteria in grading work and published models of excellent work that exemplifies standards
3. Minimal secrecy in testing and grading
4. Ample opportunities to produce work that they can be proud of (thus, ample opportunity in the curriculum and instruction to monitor, self-assess, and self-correct their work)
5. Assessment, not just tests: multiple and varied opportunities to display and document their achievement, and options in tests that allow them to play to their strengths
6. The freedom, climate, and oversight policies necessary to question grades and test practices without fear of retribution
7. Forms of testing that allow timely opportunities for students to explain or justify answers marked as wrong but that they believe to be apt or correct
8. Genuine feedback: usable information on their strengths and weaknesses and an accurate assessment of their long-term progress toward a set of exit-level standards framed in terms of essential tasks
9. Scoring/grading policies that provide incentives and opportunities for improving performance and seeing progress against exit-level and real-world standards

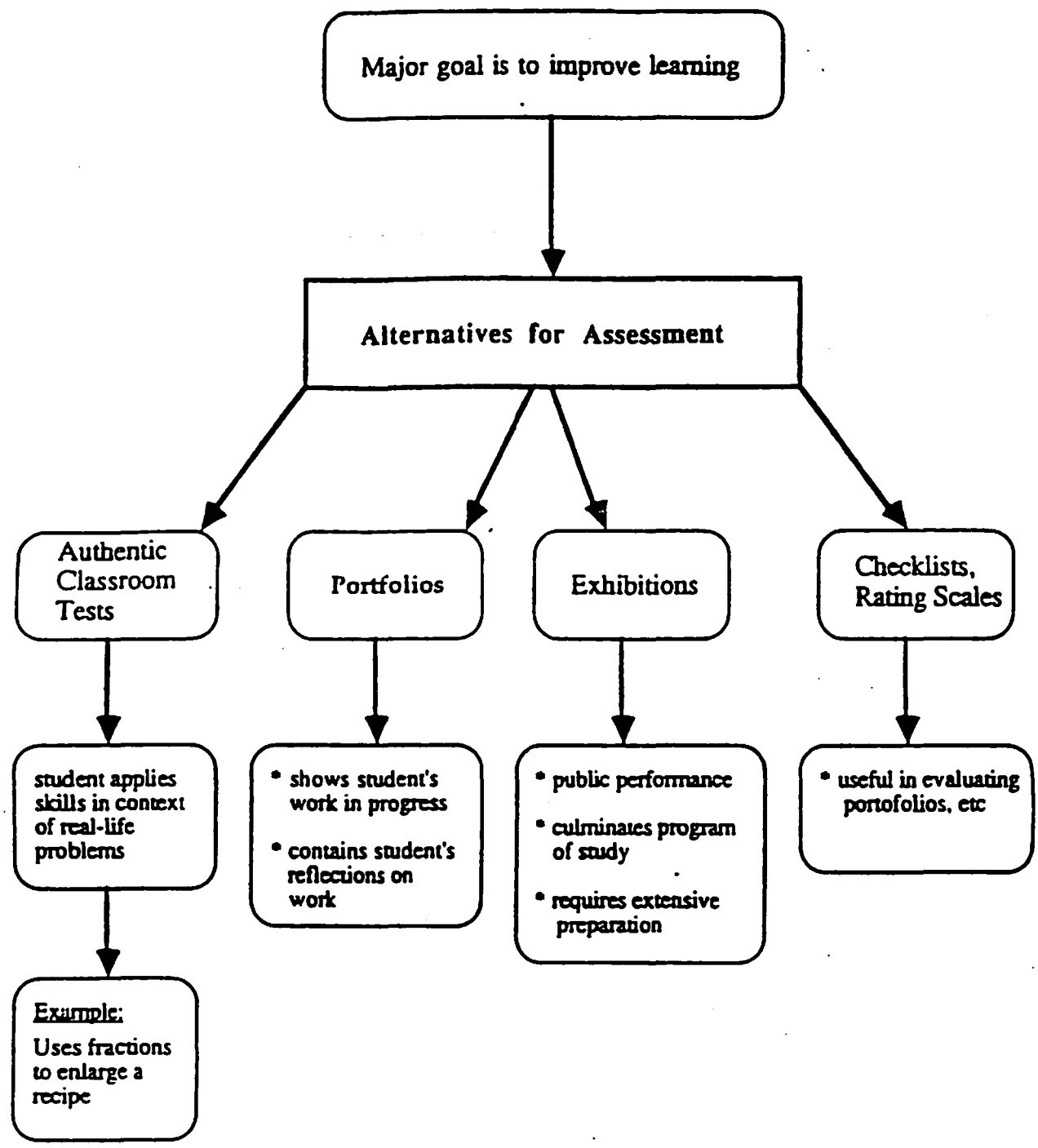
I am sorry to report that the idea of an Assessment Bill of Rights has been attacked by more than a few teachers when I have offered it in workshops. Some have actually angrily called for a *prior* list of student responsibilities (though I do not recall such a list in our Constitution). Perhaps nothing better illustrates why

GRANT WIGGINS
 (1993)

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Handout Master 15.8

Concept Map: Alternatives for Assessment



Handout Master 15.7 Characteristics of Authentic Tests

A. Structure and Logistics

1. Are more appropriately public; involve an audience, a panel, and so on.
2. Do not rely on unrealistic and arbitrary time constraints.
3. Offer known, not secret, questions or tasks.
4. Are more like portfolios or a *season* of games (not one-shot).
5. Require some collaboration with others.
6. Recur—and are worth practicing for, rehearsing, and retaking.
7. Make assessment and feedback to students so central that school schedules, structures, and policies are modified to support them.

B. Intellectual Design Features

1. Are "essential"—not needlessly intrusive, arbitrary, or contrived to "shake out" a grade.
2. Are "enabling"—constructed to point the student toward more sophisticated use of the skills or knowledge.
3. Are contextualized, complex intellectual challenges, not "atomized" tasks, corresponding to isolated "outcomes."
4. Involve the student's own research or use of knowledge, for which "content" is a means.
5. Assess student habits and repertoires, not mere recall or plug-in skills.
6. Are *representative* challenges—designed to emphasize *depth* more than breadth.
7. Are engaging and educational.
8. Involve somewhat ambiguous ("ill-structured") tasks or problems.

C. Grading and Scoring Standards

1. Involve criteria that assess essentials, not easily counted (but relatively unimportant) errors.
2. Are not graded on a "curve" but in reference to performance standards (criterion-referenced, not norm-referenced).
3. Involve demystified criteria of success that appear to *students* as inherent in successful activity.
4. Make self-assessment a part of the assessment.
5. Use a multifaceted scoring system instead of one aggregate grade.
6. Exhibit harmony with shared schoolwide aims—a *standard*.

D. Fairness and Equity

1. Ferret out and identify (perhaps hidden) strengths.
2. Strike a *constantly* examined balance between honoring achievement and native skill or fortunate prior training.
3. Minimize needless, unfair, and demoralizing comparisons.
4. Allow appropriate room for student learning styles, aptitudes, and interests.
5. Can be—should be—attempted by *all* students, with the test "scaffolded up," not "dumbed down," as necessary.

Adapted from G. Wiggins (1989) Teaching to the (Authentic) test. Educational Leadership, 46(7), p. 44.

FIGURE 10.1

Standardized Testing Versus Authentic Assessment

Standardized Testing

- Reduces children's rich and complex lives to a collection of scores, percentiles, or grades.
- Creates stresses that negatively affect a child's performance.
- Creates a mythical standard or norm which requires that a certain percentage of children fail.
- Pressures teachers to narrow their curriculum to only what is tested on an exam.
- Emphasizes one-shot exams that assess knowledge residing in a single mind at a single moment in time.
- Tends to place the focus of interpretation on errors, mistakes, low scores, and other things that children *can't* do.
- Focuses too much importance on single sets of data (i.e., test scores) in making educational decisions.
- Treats all students in a uniform way.
- Discriminates against some students because of cultural background and learning style.
- Judges the child without providing suggestions for improvement.
- Regards testing and instruction as separate activities.
- Answers are final: students rarely receive an opportunity to revise, reflect, or redo a testing experience.
- Provides results that can be fully understood only by a trained professional.
- Produces scoring materials that students often never see again.
- Focuses on "the right answer."

Authentic Assessment

- Gives the teacher a "felt sense" of the child's unique experience as a learner.
- Provides interesting, active, lively, and exciting experiences.
- Establishes an environment where every child has the opportunity to succeed.
- Allows teachers to develop meaningful curricula and assess within the context of that program.
- Assesses on an *ongoing* basis in a way that provides a more accurate picture of a student's achievement.
- Puts the emphasis on a student's *strengths*; tells what they *can* do and what they're *trying* to do.
- Provides *multiple* sources of evaluation that give a more accurate view of a student's progress.
- Treats each student as a unique human being.
- Provides a *culture-fair* assessment of a student's performance; gives everyone an equal chance to succeed.
- Provides information that is *useful* to the learning process.
- Regards assessment and teaching as two sides of the same coin.
- Engages the child in a continual process of self-reflection, mediated learning, and revision.
- Describes a child's performance in common-sense terms that can be easily understood by parents, children, and other noneducators.
- Results in products that have *value* to students and others.
- Deals with *processes* as much as final products.

Grant Wiggins (1989)

Authentic Assessment (intell equiv of public perform):

1. Writing essays and reports
2. Conducting individual research
3. Conducting group research
4. Interviews and data collection
5. Data manipulation, preparation, & graphing
6. Written recommendations
7. Designing proposals and mockups
8. Assembling proposals
9. Class presentations
10. Artistic and other performances
Recitals, sports, plays, debates, science fairs
Need equiv of diff rating classes for chess tourn

Evidence of Knowing:

1. Providing counterexamples (Perkins & Salomon)
2. Arranging arguments
3. Arguing critically
4. Marshalling evidence
5. Pose problems
6. Solving ambiguous problems
7. Explaining and extending knowledge
8. Good judgment, sound habits, responsiveness
9. Asking for help and helping others (Paris et al.)
Ask q's, uses evidence, notes impt diffs
10. Doing something with grace and style

Portfolio Ideas:

1. journal logs or reflections on work performed.
2. various drafts of a research paper with feedback comments.
3. synthesis across research papers.
4. samples of groupwork on topic.
5. initial and ending concept maps.
6. class summary activities or reflection/reaction logs.
7. problem solving activities.
8. summary of exhibitions or demonstrations of knowledge.
9. summary page of what is all included.

Authentic Assessment Tests

- are appropriately more public with audience or panel.
- avoid unrealistic time constraints.
- offer known questions or tasks.
- more portfolio-like; not one-shot.
- require some collaboration with others.
- are worth practicing, rehearsing, retaking.
- make assessment and feedback essential.

(representative of perf in the field, learning the criteria to be used in assessment, self-assessment, expected to present and defend work)

Design Features of Authentic Assessment

1. essential not intrusive or meant to shake out a grade
2. enabling and point student to sophisticated use of skills
3. contextualized not atomized
4. involve students own research
5. assess repertoires not recall
6. depth (and challenges) not breadth
7. engaging and educational
8. somewhat ambiguous or ill-structured tasks

Evaluation Questions:

1. How might students gain from "XYZ" activities?
2. What forms of assessment might best inform teaching?
3. What is fair assessment of learning gains/losses?
4. How do measure conceptual gain?

Conceptual Evaluation:

1. Conceptual/Word Linkages
Concept Maps, Venn Diagrams, concept circles, semantic maps, timelines, graphs, webs, sequence chains, story map, main idea table, attribute wheel, triads.
2. Peer Evaluation.
3. Holistic Ratings and Trait Analytic/Dimensional Scoring
Adequacy of Info; Richness of Add'l Info; Relationships Drawn; Inferences Made; Synthesis & Gens; Eval of the Merit of Ideas; Framing/Grouping/Unity; Style/Tone
4. Meet with the student or get retrospective reports
5. Record observations of group processes
 - a. look for behavior that facilitates group attainment such as asking pertinent questions, seeking additional info, building on the ideas of others, praising, helping.
6. Ask students for process observer criteria
7. Open ended questions...Give students data such as flame colors for metallic ions and ask "what does this mean?" "What correlations can you infer?"
8. Consider joint evaluation or grading improvement
9. Use reaction sheets, journal logs, thought papers, and volunteer assignments
10. Essay, summary, and sentence verification tasks.

Grading and Scoring

1. Involve criteria that assess essentials
2. Not graded on a curve, but in ref to perf. standards
(criterion-referenced not norm referenced)
3. Demystified criteria of success inherent in successful activity
4. Self-assessment a part of assessment
5. Multifaceted scoring system
6. In harmony with shared schoolwide aims

Fairness and Equity

- Ferret out hidden strengths
- Constantly balances honoring achievement and native skill
- Minimizes unfair, demoralizing comparisons
- Allows room for learning styles, aptitudes, and interests
- Test scaffolded up or down as necessary
- Accountability serves student lrng (face & ecological validity are most imp.)

SCORING / ASSESSMENT

1. Concept Maps:

CMAPS Quality Rating (Scale 1 (low) to 10 (high) for this dimension) Grading Based on 8 dimensions:

- ___ 1. Ideas (info richness, elaboration, originality, interesting, unique analogies in maps and writing)
- ___ 2. Clarity (sequential flow, coherence, unity, organization, logical sequence, understandable style)
- ___ 3. Completeness (adequate info presented, valid pts, fulfills task intent, some breadth and depth)
- ___ 4. Relevancy (related to class topics, meaningful links to class, descriptions correspond to picture)
- ___ 5. Relationships Drawn (indicates personal understanding, verbal descriptions, connections, some uniqueness)
- ___ 6. Format (mechanics, spelling, grammar, sentence structure, readable, indexed symbols, coded, presentable)
- ___ 7. Overall Creative Reps & Examples (impressiveness, original, artistic, unusual, color, design, perspective)
- ___ 8. Overall Logical Reps & Examples (depth, breadth, development, accurate portrayal, coherent/useful summary)
- ___ Total

2. Scholarly Journal:

Sample Grading Criteria for this assignment (70 points for your manuscript)

- ___ 1. Ideas (richness of information, elaboration, originality, interesting)
- ___ 2. Originality (creativity, unusualness, artistic, max effort, risk)
- ___ 3. Coherence (clarity, unity, organization, transitions, logical sequence, synthesis, style)
- ___ 4. Completeness (adequate info presented, fulfilled spirit of assignment, depth of disc.)
- ___ 5. Linkage (relevancy to class, impt points made, shows evidence of learning, chapter refs)
- ___ 6. Mechanics (spelling, format, punctuation, grammar, sentence structure)
- ___ 7. Overall Holistic (general impression rating, summary rating)
- ___ Scale: 1 (low) to 10 (high) for each dimension = 70 Total Points

Note that the assignment is worth 130 points: 70 points for your work and 60 for your group publication:

- ___ 1. journal format/layout/organization.
- ___ 2. clarity/readable/logic.
- ___ 3. originality/unique/creativity.
- ___ 4. completeness/elaboration/fulfills spirit of assignment.
- ___ 5. average score of articles you published (20 points).
- ___ Total

3. Timelines and Reflection Papers

These externalization activities will be graded on 6 dimensions on a 1 (low) to 10 (high) scale:

- ___ 1. Ideas (info richness, elaboration, originality, interesting, unique analogies b/t top and bottom charts)
- ___ 2. Sequential Flow (coherence, unity, organization, logical sequence, understandable style, clarity)
- ___ 3. Completeness (adequate info presented, valid pts, fulfills task intent, some breadth and depth)
- ___ 4. Relevancy (related to class topics, meaningful links to class, descriptions correspond to picture)
- ___ 5. Relationships Drawn (indicates understanding, verbal descriptions, connections)
- ___ 6. Overall External Representations (depth, breadth, development, impressiveness, accurate portrayal)
- ___ Total

4. Presentations

Scoring: (1-10) if for 50 points

- ___ Review of the Problem and Literature: interesting, relevant, current, organized, thorough
- ___ Research Activity/Design/Topic: clear, doable/practical, detailed, important research q's
- ___ Organization of Presentation: flow, length, sequence, focus and procedures clear, good questions raised
- ___ Topic/Materials Stimulation/Usefulness: informative, excitement, active, clear, easy to see/understand
- ___ Knowledge of Topic: expertise displayed, has good ideas for field, insights, unique questions***
- ___ Total Points
- a. Other: Interesting Points, Questions to Ponder, Other.

5. Research Papers:

Research Proposal Grading Scale (Note 1 (low) to 10 (high) for each of the following criteria):

- ___ 1. Review of the Problem and Literature (interesting, relevant, current, organized, thorough)
- ___ 2. Research Activity/Design/Topic (clear, doable/practical, detailed, important research q's)
- ___ 3. Overall Richness of Ideas (richness of information, elaboration, originality, future directions)
- ___ 4. Overall Coherence (unity, organization, logical sequence/flow, synthesis, style, accuracy)
- ___ 5. Overall Completeness (adequate info presented, explicit, relevant, precise, valid pts)

Stealing Assessment and Evaluation Activity

1. Reflect on how assess courses or evaluate programs.

2. Share with someone.

3. Take one of those ideas and incorporate it.

BLUEPRINTS FOR THINKING....

For Mine...

Important Ideas	Interesting Ideas	Dumb Ideas

For My Partner...

Important Ideas	Interesting Ideas	Dumb Ideas

For Our Group...

Important Ideas	Interesting Ideas	Dumb Ideas
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For Our Group...

Important Ideas	Interesting Ideas	Dumb Ideas

Alternative Instructional Strategies

Solid:

Fuzzy:

Tell/Teach/Heard About	Tell/Teach/Heard About
1. 	1.
2.	2.
3.	3.
4.	4.
5.	5.

Personal Reflections:

Bellanca, J & Fogarty, R (1991): 8 key attributes:

(SMART SCHOOLS)

- (1) the structure: Architectural buildings & facilities (school as hub of community)
- (2) the school calendar and schedule: Calendar year (year round/extended year) and daily schedule (extended day)
- (3) the classroom: Grouping of students (heterogeneous grouping, alt. to tracking) Shifting from graded classrooms to family clusters (primaries ages 4-8), middle schoolers (9-14) secondaries (15-18)
- (4) the curricula: Goals, organization, content & evaluation- Shifting from units of study to integrated curriculum
- (5) the personnel: peer coaching with emphasis on supportive planning, observation, and feedback
- (6) teacher training: comprehensive professional development; new teacher induction models
- (7) the results: use of authentic assessment strategies
- (8) beyond school years: Life-long learning including pre-school and adult education

Changing lives one class at a time



USA
Today
1A
10/14/99

Fun with learning: Gavin H. Cochran Elementary School's Michael Terrell uses edible candy bubbles to show Armand Newton, left, and Christopher Fudge, both 6, how things float.

Honorees find keys to unlock kids' minds

By Tracey Wong Briggs
USA TODAY

In rural Alaska, science teacher Steven Jacquier's high school students feed alcohol to pregnant mice.

After the students see the deformed fetuses that develop, they hold clinics to spread the message in their Eskimo villages, where fetal alcohol syndrome is a major problem.

In Walnut, Calif., Suzanne Middle School teacher Alan Haskvitz had his social studies students rewrite voting instructions because they couldn't understand them. Their changes were used by Los Angeles County.

And in Newnan, Ga., sev-

COVER STORY

IN LIFE: 3 full pages

enth- and eighth-graders who have arrived at Fairmont Alternative School through the juvenile court system can experience the other side of the bench as judges, lawyers, bailiffs and jurors through a school judicial system Carmella Williams Scott created to turn criminal thinkers into critical thinkers.

For their success at unlocking student minds and making a difference in their lives, Jacquier, Haskvitz and Scott, along with 13 other individual teach-

ers and four teaching teams, have been named to USA TODAY's All-USA Teacher First Team as representatives of all outstanding teachers.

The 20 winners were selected from 599 nominees nationwide. They will be honored Friday at USA TODAY headquarters in Arlington, Va., where they will receive trophies and \$2,500 for their schools.

Twenty more nominees were named each to the Second and Third All-USA teams.

"These stellar teachers inspire their students to be the best they can be, academically. They also teach lessons of em-

COVER STORY next page ►

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Masters of their craft, they never stop learning

By Tracey Wong Briggs
USA TODAY

Where most people see a storm brewing, teacher Neatie Green sees a weather lesson. As Hurricane Floyd loomed last month, Green fetched a teakettle to show her pre-kindergartners in Augusta, Ga., what water vapor is and how clouds are formed.

"Children have taught me a lot about being curious, and I use that in my teaching," says Green, whose program at Tobacco Road Elementary School is so renowned that parents are willing to drive their children from other counties to have them in her class.

That quality — being eternal students of the world and of their classrooms — may be what sets master teachers apart, education experts say.

"They're always, always current and learning. No matter what's going on, they're able to find an opportunity for kids to learn — and for themselves to learn," says Mary Beth Blegen, 1996 National Teacher of the Year and U.S. Department of Education teacher in residence.

Truly great teachers are constantly evaluating and refining their work, says Penelope Earley, senior director of the American Association of Colleges for Teacher Education. "When you go into their classrooms, you don't see discipline problems because they're so good at getting kids engaged in their own learning," she says. "Children want to be in that class."

Beyond a deep knowledge of their subjects and a deep desire to work with students, master teachers just never give up on kids, says Gary Galluzzo, dean of the Graduate School of Education at George Mason University in Fairfax, Va.

And that's a matter of passion, both for what you teach and for the students, says 1998 All-USA Teacher Team member Bryan Munson, who moved from Richmond, Ky., to teach English and journalism at Monacan High School in Richmond, Va.

As a teacher new to his school, he was asked whether he's a "hard" teacher or an "easy" one. "If I'm hard, I'm not doing my job, and if I'm easy, I'm not doing something," he says. He strives to be challenging. "A master teacher kind of raises the bar and makes you want to get there."



By Ray Au for USA TODAY
Bryan Munson: Formerly of Richmond, Ky., above, he says he's neither 'hard' nor 'easy.'

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Create an Overview Model

(for using alternative instructional strategies)

Team Webs or Diagrams

1. Draw your vision of Cooperative Learning: **your roadmap, flowchart, or mnemonic**
(find some construction paper and crayons!!!)
2. Write a philosophical statement, goals, method selection, assessment
3. List your social and/or cognitive skill goals
4. What percent of time will you use cooperative learning techniques (set a goal).
5. Decide on a content areas wherein you might use CL strategies
6. Jot down 2-3 ways you might you use CL next year and what alternative would you make?
(label the methods if known--e.g., Jigsaw I, Structured Controversy, Debates)
7. Describe technique modifications, roles, grpg strats, and other CL principles.
8. Decide on assessment technique(s): tchr/peer assess, when/how/who assess
 - a. Three Stay, One Stray (go spy on other groups)
 - b. Gallery Tour or Present to the Class

Getting Started

a. *The Barriers to Learner-Centered Curricula and Active Learning:*

- Lack of focus, no stated purpose, time-consuming, inefficient, hard to grade, too shocking

b. *Caveats/Getting Started with Active Learning:*

1. From explicit to implicit (Model, give purpose, grant ownership and allow to create)
2. Start small.
3. Link methods.
4. Think beyond activities in 1-2 classes.
5. Use themes to drive lessons.
6. Have teachers intervene to clarify conflicts and issues.
7. Have teachers nurture the discussion over simply covering the activity.
8. Gather evidence.
9. Organize teachers, colleagues, parents, and community members.
10. Prepare for skepticism.

c. *Final Remarks:*

- Human minds want complex challenges
- Human minds want some expert guidance and authenticity
- Human hearts want some respect and empowerment
- Human hearts want some social support
- Humane schools must begin where the student is
- Humane schools must provide supportive learning environments

Teachers: Challenge and Support
Students: Construct and Relate
Schools: Respect and Enrich

d. *Possible Final Activities*

1. Phillips 66 on what you've learned.
2. *Stand and Share new insights (mark on notecard and stand).*
3. Tell a tall tale about your school or work setting in 2 years.
4. *Plus, Minus, Interesting about this course...*
5. Cost benefit analysis: What are the costs and benefits of these strats?
6. *Muddiest Point Paper: what didn't click here...???*
7. Morphological synthesis: create entirely new strategies.
8. *Prune the Tree: I am thinking of a strategy...Can you guess what it is???*
9. Rank all these strategies & come up with a David Letterman top ten list.
10. *Metaphor: What is you teaching metaphor now?*

e. *New Metaphors of Schooling:*

(Now what is your ideal vision of work or schooling in your organization/district/school/classroom: a Prison, Tour Bus/Expedition, Military Camp, Beehive, Museum, Garden, Team, Family, Cafeteria, Olympic Game, Monastery, Oasis, Brain, Laboratory, International Airport, Ocean, Exhibition, Theme Park, Camping Trip, Nursery, Court Room, Living Organism, or what (Pick 1-2 or 3; refer back to p. ??????)

List would you like to see as your guiding metaphor(s): _____

1. List metaphor and one best strategy on index card (and any other feedback).

Creativity: Young (1985): Creativity (p. 78) "is the skill of bringing about something new and valuable." p. 82 "Creative people do more than break away from old patterns. They do more than find alternatives: They diverge from familiar patterns, but then they converge on new solutions. They break laws to remake them. They make hard decisions about what to include and what to eliminate. Creative people innovate. They aim toward newness. This can be considered in several senses:"

10+ Creative Thinking Ideas:

1. Brainstorming

More ideas/wilder the better, no eval, combo to improve
(How to study better?)

2. Reverse Brainstorming

(How to study worse?)

3. Nominal Group Process (Rank Ideas)

(What technology resources does the school need?)

4. Idea Checklists or Cards

e.g., Osborn's SCAMPER method: How do we:
substitute, combine, adapt, modify/max-min, put to other uses, elim, rev/rearrange

5. Six hats

(wear different color hats for different types of thinking)

6. Free Write/Wet Ink

(Best teacher ever had)

7. Checkerboarding, Attribute Listing, Morphological Synthesis

(Analyze or combine two key variables or components in a grid/matrix)

8. Analogies, Metaphors, or Forced Associations

(This school is like a ____; An effective presenter is like a ____?)

9. Webbing/Chaining/Linking of Ideas

(What is a greenhouse effect???)

10. Simulations and Role Plays

(events leading up to the American Revolution)

11. Other techniques

- The Second Best Answer, What else, > 1 Right Answer
 - Elaboration/Explication
 - Diaries, Personal Journals
 - Just Suppose/What If Exercises
 - Creative Dramatics/Improvisation

Critical Thinking: (i.e., seek justification, recognize relationships, assess credibility of sources, looks at reasons/evidence, drawing inferences, identifying alternatives, logical deductions, sequences and order, defending an idea.)

10+ Critical Thinking Ideas:

1. **Critiques**
(new state testing requirements)
2. **K-W-L**
(What do you know?, What want to know?, What did you learn?)
3. **Plus, Minus, Interesting**
(character analysis, decision making)
4. **Pruning the Tree (20 q's); Working Backward**
(From answer to problem)
5. **Reflection Logs/Think Sheets**
(1 minute papers)
6. **Graphic Organizers, Flowcharts, and Concept Maps**
(science concepts, main ideas, advantages and disadvantages)
7. **Mock Trials**
(putting someone on trial)
8. **Debates--Examine Both Sides of Argument**
(protecting the spotted owl, cutting of valuable timber, boating on the boundary waters)
9. **Case-Based Reasoning**
(Case A, Case B; Case & Commentaries; Cumulative Case; Critical Instance; Condensed)
10. **Summing Up**
Summaries, Reviews, Index Cards, Abstracts, Outlines, Nutshelling
(daily lectures of readings)
11. **Other techniques**
 - **Graph and Venn Diagrams**
 - **Classification Schemes, Taxonomies**
 - **Categorize and Organize**
 - **Identifying Main Points**
 - **Compare and Contrast Matrices**
 - **Alternatives, Possibilities, Choices**
 - **Find Patterns/Relationships**
 - **Other Points of View**
 - **Cost-Benefit Analysis**
 - **Rank Ideas**
 - **Cause-Effect**

Generic Cooperative Learning Methods:

1. **Turn to your partner and...**
check work, review for test, discuss, think aloud
2. **Think-Pair-Share**
think about problem, write down, share with partner and then class.
(Video Segments--turn to partner and react, predict, compare pts)
3. **Round-robin**
students contribute ideas orally in turn, clockwise or counterclockwise.
4. **Roundtable**
one piece of paper is rotated around the table.
5. **Group discussion with roles**
checker, recorder, reporter, facilitator.
(Using with cases analysis or problem solving)
6. **Numbered Heads Together**
count off within each group 1, 2, 3, etc.; teacher calls on a #
7. **Team-Tournaments**
gameshow competitions, quizzes, or tests in partnered teams.
8. **Jigsaw**
divide base group up, go to expert grp to learn, report back to base.
(Become an expert on an aspect of Native American culture)
9. **Group Investigation**
divide a topic into subtopics for each student in the group.
10. **One stay, three stray; or, Three stray, one stay.**
11. **Inside-Outside/Fish Bowl**
group on inside talk and outside listen and then switch roles.
12. **Gallery tours**
post student or group work and have them explain it to others.
13. **Stand and share**
when know the answer stand up and when hear it sit down.
14. **Value lines or human graphs of responses**
mark on board or line-up for what you believe in.
(Solid waste disposal; PCB problems)
15. **Problem-Based Learning**
(Designing/Inventing Products: ideas before commitments & details,
explore models, think on paper, easy to use, safe, durable, attractive,
comfortable, reasonable cost)

Others: CIRC, Group Investigation, Teams-Games-Tournaments, STAD...

In Badrul H. Kahn (Ed.), *Web-based Instruction Technology*. Englewood Cliffs, NJ: Educational Publications. (pp. 167-178)

20

Learner-Centered Web Instruction for Higher-Order Thinking, Teamwork, and Apprenticeship (1997)

Curtis Jay Bonk and Thomas H. Reynolds

During the upcoming decade, we will undoubtedly see momentous advances in Web-based instruction (WBI), spurred by new developments in the information superhighway, the design of innovative World Wide Web technology tools and features, and the growing acceptance of learner-centered instructional principles and techniques (American Psychological Association (APA), 1995). Chronicling the "common" Web-based instructional techniques in existence today will likely appear limited when compared to approaches that supersede them in the 21st century. In order to extend the half-life of this chapter, therefore, our goals are three-fold:

- ground current examples of Web-based instructional techniques, tools, and practices in learner-centered pedagogy;
- provide a menu of Web-appropriate alternative instructional strategies for creative and critical thinking as well as cooperative learning; and
- raise the discussion of WBI to issues of learning apprenticeships and student perspective taking.

The Learner-Centered Movement

The learner-centered movement has encouraged instructors to create challenging and novel environments that help learners link new information to old, seek meaningful knowledge, and think about their own thinking. Important to WBI, learning is now deemed heavily influenced by social interactions and environmental factors such as culture, technology, and instructional practices (APA, 1995). As educators and researchers increasingly accept Vygotsky's (1978) views that the social plane is the origin of all mental activity and growth (Brown & Palincsar, 1989; Chang-Wells & Wells, 1993; Salomon 1988), student learning is increasingly analyzed in a social context. From this sociocultural perspective, meaning is seen as a negotiation and knowledge building process within a learning community (Bonk & King, 1995; Brown, Ash, Rutherford, Nakagawa, Gordon, & Campione, 1993; Koschmann, 1994; Scardamalia & Bereiter, 1994; Tharp & Gallimore, 1988; Wells & Chang-Wells, 1992). The World Wide Web is one such learning community wherein learner-centered instructional techniques have exhibited significant promise.

Wagner and McCombs (1995) recently pointed out that distance education technologies such as the World Wide Web offer ideal possibilities for placing students at the center of one's learning environment. In fact, in the most successful online courses and global networks, students are assuming significant instructional roles (e.g., offering tips and helping construct new knowledge) that transform traditional teaching practices and student learning opportunities (Harasim, 1993).

The asynchronous communication of the World Wide Web offers students a palette of online information resources (e.g., movies, instructor notes, expert reports, course updates, interactive experiments, electronic libraries, reference rooms, assignments, quizzes, readings, student products, and self-selection task options) (Harasim, Hiltz, Teles, & Turoff, 1995) as well as new routes for student social interaction and dialogue (e.g., voice and text chat tools, virtual whiteboards, public text pointing devices, teacher or expert commentary options, debate forums, student opinions, peer knowledge bases, and transcripts of previous student interactions) (Bonk, Medury, & Reynolds, 1994; Bonk, Reynolds, & Medury, 1996; Fetterman, 1996, in press). It is the premise of this chapter that as these interactive resources and tools materialize on the Web, the importance of one's instructional selections coincidentally rise in salience. Consequently, any instructional guidelines provided here should prove useful and timely for future Web instructors.

The Web is a tool for "assisting in learning" (see Tharp & Gallimore, 1988), not simply an extension of or substitution for traditional teaching practices (Fetterman, in press). As assistants of learning, instructors manage and structure tasks, model and demonstrate ideas, provide questions and feedback, coach or scaffold learning, encourage students to articulate beliefs and ideas, foster student reflection and self-awareness, push student exploration and application of skills, and directly instruct when appropriate (Bonk & Kim, in press; Collins, Brown, & Newman, 1989; Rogoff, 1990; Tharp, 1993). During this learning assistance, learners browse, build, link, juxtapose, and reflect on new knowledge. While most WBI ideas about learning assistance appear to be speculative and untested, a myriad of innovative and exciting pedagogical strategies are emerging for WBI as we head into the next millennium.

Alternative Web-Based Instruction Strategies: Creative, Critical, Cooperative

The status of the World Wide Web as an alternative instruction delivery mechanism will soon focus educator and researcher attention on how WBI classes foster student creative processes, critical thinking, and small group work. As such, there are literally hundreds of instructional approaches available for Web instructors to promote idea generation, planning, organization, critique, and reflection on the Web; far too many to detail here. Though still somewhat broad in scope, this chapter focuses on ideas for enhancing creative and critical thinking, followed by a brief account of instructional approaches for cooperation and collaboration on the Web.

Creative Thinking on the Web (See Table 1)

If creativity requires students to sense gaps in information, make guesses and hypotheses, test and revise ideas, and communicate results (Torrance, 1972), what better tool is there than the Web? Web browsing tools now exist to explore and search for information, dynamically view the results of one's choices, and send these findings to instructors and peers. As indicated earlier, the teacher's role here involves managing the distribution of these self-selection activities (Harasim *et al.*, 1995), as well as scaffolding them with comments and suggestions that guide and intellectually support learner achievement during various learning quests (Teles, 1993). Apparently, the Web may be the ideal tool to nurture students' willingness to take risks,

commitment to task, curiosity, openness to experience, broad interests, originality, imaginative play, intuition, attraction to novelty and complexity, artistic ability, metaphorical thinking, problem finding, elaboration of ideas, and breaking away from the norm; all of which are key attributes of creative people (Davis, 1992; Starko, 1995; Young, 1985).

Researchers such as Davis (1992), Perkins (1986), and de Bono (1994) have championed instructional techniques that address students' divergent or creative thinking. In WBI, chat boxes, windows, and conferencing options might embed a number of creative thinking op-

Table 1. Summary of suggested creative thinking techniques for the Web.

<p>1. Brainstorming: Focus on (1) quantity or more ideas; (2) the wilder the better; (3) no evaluation; and (4) building on, combining, improving, and hitchhiking on ideas is sought. (e.g., What are ways schools can be more effective?)</p>
<p>2. Reverse Brainstorming (Davis, 1992; Starko, 1995). (e.g., What are ways schools can be less effective?)</p>
<p>3. Assigning Thinking Roles in Role Plays. (e.g., In restructuring Shields Elementary School, I want to consider how the World Wide Web might play a more central role in instruction. For this discussion, you will randomly be assigned one of the following roles: summarizer, judge, connector, mentor, warrior, mediator, inventor, watchdog, debator, improver, commentator, idea squelcher, idea generator, questioner, devil's advocate, optimist, etc.)</p>
<p>4. Creative Writing: Telling Tall Tales, Story Starters, Forced Response Wrap Arounds, Newsletters, Cartoons, Object Obituaries, Jokes, Riddles, Object Talking (Golub, 1994). (e.g., "I visited a school yesterday that was real inspiring in terms of their instructional approaches and incorporation of technology in education. In this school, I saw 500 computers all fiber optically networked to....John, can you continue this story?")</p>
<p>5. Simulations and Role Plays. (e.g., We are going to simulate a school restructuring meeting. You will each be assigned one of the following roles: parent, teacher, administrator, politician, student, real estate agent, professor of education, community leader, corporate executive, etc.)</p>
<p>6. What If, Just Suppose, and Rearrange the Facts Exercises. (e.g., What if you were put in charge of Littlefeat Elementary School? Or: Just suppose that your local high school received a \$3 million grant for restructuring and you were the curriculum director. What would you do...?)</p>
<p>7. Metaphorical Thinking, Analogies, Forced Associations, Synectics (Davis, 1992). (e.g., This school is like a ____ (for example, a prison, museum, monastery, a beehive, etc.)? Or: An effective teacher is like a ____ (for example, a tour guide, surveyor, orchestra conductor, mechanic, baker, artist, etc.)?)</p>
<p>8. Free Writing, Diaries, Personal Journal Logs, Wet Inking. (e.g., After viewing this film on learner-centered schools, I want you to jot down some reflective notes for no more than ten minutes on a school you have observed that embodied many of these principles. Try to write down the first things that enter your minds, no matter how silly or unrelated they may seem.)</p>
<p>9. Idea-Spurring Questions, Checklists, or Cards (Davis, 1992). (e.g., Think about the Web site you have created on learner-centered schools. What can you do to improve it? What can you add? What can you delete? Modify? Combine? Make bigger? Make smaller? Reverse? Rearrange? Minimize? etc.)</p>
<p>10. Semantic Webbing, Mapping, Linking, Chaining, Free Association Exercises. (e.g., With the word "effective schools" in the middle of a semantic map, I want you to suggest any attributes and characteristics related to this concept that you think of.)</p>

tions. For instance, in a course on school restructuring, the instructor might use conferencing tools and interactive chat windows to begin the course with a simple brainstorming or reverse brainstorming exercise intended to loosen students up (Starko, 1995). To further promote interactivity and creative license among participants, students might be assigned thinking-related roles within these forums (e.g., summarizer or commentator) (Bonk & Smith, 1996). Importantly, such role assignment has proven effective in both electronic mail and computer conferencing systems when used to discuss critical course issues or controversial case vignettes (Bonk, Appelman, & Hay, 1996). Starter activities such as "telling tall tales" (Golub, 1994) are additional ways the instructor can initiate an imaginative electronic discussion on a topic and have everyone add to it with his or her own unique perspective.

One longitudinal study of asynchronous environments found that these interactive conferences and discussions tend to be more extended and engaging for students than traditional lecture-based instruction (Chong, 1996). According to Harasim *et al.* (1995), the anonymity of pen names and pseudo-roles during electronic discussions encourages student idea experimentation and risk taking disclosures. Students' assigned roles, as noted in Table 1, might parallel occupational choices or societal interests. Though roles might be randomly assigned or based on order of entry into the conversation, with the careful task structuring and instructor scaffolding, such interactive simulations and role plays can become common discourse activities on the Web.

Thoughtful planning also impacts the successful use of Web-based hypermedia environments, since students and instructors often want to instantly capture and replay video sequences and problem vignettes in order to locate additional information or view situations from alternative perspectives (The Cognition and Technology Group at Vanderbilt, 1991). Innovative use of such resources by Web instructors might spur additional curiosity and dissonance by continually rearranging key features of a predicament or situation with a series of "just suppose" and "what-if" exercises. Though relatively simple, these exercises help students break from their current mental set and find new insights (Davis, 1992).

Other creative thinking techniques for the Web might include student free writing or metaphorical thinking on a key course topic such as "effective schools." Afterwards, students' free writing and metaphors of effective schools might be compared to lists generated by previous or current course participants. Similar writing tasks, such as student private journal logs or diaries of Web explorations, also can spark creativity. Additional encouragement for divergent thought and ideas when writing might come from idea-spurring questions, cards, and checklists strategically inserted into Web activities by the instructor.

As Web software becomes more sophisticated, proposals from students on specific topics (e.g., how to create effective schools) might eventually be entered in attribute webs or interactive ferris wheels (Lyman, 1992; McTighe, 1992) and then randomly spun to juxtapose ideas from alternate wheels to help students discover other angles and viewpoints. Or perhaps software tools might take student ideas and automatically add them to idea webs or semantic maps being constructed by a class on the World Wide Web. As such tools for creative thought emerge, WBI may help students challenge the rules, exercise one's "risk muscle" (von Oech, 1983), discover new patterns and relationships, improvise, and add details to one's work. Despite these extensive divergent thinking avenues, enhancing critical thinking pathways may be an equally strong dimension of the web.

Critical Thinking on the Web (See Table 2)

Besides impacting creative thinking and general problem solving processes, some WBI techniques directly enhance student evaluation of materials and resources. According to leading thinking skill proponents (Beyer, 1988; Ennis, 1989; Paul, 1990; Presseisen, 1986), critical

thinking is used to select information, evaluate potential solutions, determine the strength of an argument, recognize bias, and draw appropriate conclusions.

Whereas semantic webs and free association exercises are creative devices, most graphic organizers facilitate critical thinking since they help students sort out the hierarchy and logical flow of ideas. Student mapping of Web-based conferencing discussion threads is just one relatively simple and useful application of this idea. Other Web-based instructional activities that have students create or modify spatial representations of information (e.g., Venn diagrams or concept maps) provide opportunities for students to display knowledge depth and overall conceptual understanding (Angelo & Cross, 1993).

Table 2. Summary of suggested critical thinking techniques for the Web.

<p>1. Graphic Organizers: Flowcharts, Models, Concept Maps, Venn Diagrams, Decision-Making Trees, Sequence Charts. (e.g., I want you to draw a Venn diagram comparing traditional and learner-centered instruction as well as detailing areas of overlap between the two, if any.)</p>
<p>2. Voting or Ranking Methods, Nominal Group Process. (e.g., Please categorize and rank the ideas on the list we generated while brainstorming ways to create more effective elementary schools in the United States.)</p>
<p>3. Plus, Minus, Interesting (PMI), Pros and Cons (de Bono, 1994). (e.g., Record the positives, negatives, and interesting aspects on your Web readings for this week.)</p>
<p>4. Minute Papers, Reflection Logs, Think Sheets, Guided Questioning. (e.g., What was the muddiest point of the instructor Web notes on school restructuring?) (Angelo & Cross, 1993)</p>
<p>5. K-W-L (de Bono, 1994). (What did you already know about school restructuring? What do you still want to know about school restructuring? What did you learn in this part of the course or in your Web explorations about school restructuring?)</p>
<p>6. Summing Up: Summaries, Abstracts, Reviews, Index Cards, Outlines, Nutshelling. (e.g., I want you to summarize one school restructuring article or homepage you read during the past week while browsing the Web.)</p>
<p>7. Critiques, Rebuttals, Replies, Rejoinders. (e.g., I want you to critique an article you found on the Web related to school restructuring and also write a potential rebuttal to the original author(s).)</p>
<p>8. Mock Trials, Debates, Examining Both Sides of Argument, Force Field Analysis. (e.g., Please list three arguments for and three arguments against moving from traditional instruction to APA's 14 learner-centered principles in your local high school.)</p>
<p>9. Case-Based Reasoning: Case A, Case B; Case and Commentaries; Cumulative Cases; Critical Instances, Problem Vignettes. (e.g., After reading and replying to the first case on school restructuring at Thoroughgood High, wherein the authors admitted it took five years of careful planning, I want you to read the follow-up case on New Beginner Middle School, where restructuring efforts just began last year. Then we will reply to the following questions . . . as well as those you want to discuss.)</p>
<p>10. Categorization Schemes, Taxonomies, Comparison and Contrast Matrices. (e.g., After immersing yourself in the articles you find on the Web related to school restructuring, I want you to categorize or classify these articles into a coherent and useful organizational scheme or matrix.)</p>

Another critical thinking method with strong ties to creative thinking activities is the use of voting methods. The nominal group process (Bonk & Smith, 1996), for example, is often used to rank and categorize student brainstormed ideas. According to Harasim *et al.* (1995), since voting methods help students appreciate peer rankings of assignments and class ideas, it is both motivational for the students and insightful for the instructor. As networked worlds (Harasim, 1993) evolve, these voting results may highlight where participant opinions and ideas are similar as well as vastly different according to age, gender, and geographic locale.

Besides idea ranking, various writing-to-think activities are extremely useful in fostering student reflection and critical evaluation (Applebee, 1984; Greene & Ackerman, 1995). Students on the Web might list the plus, minus, and interesting (de Bono, 1994) aspects of an assignment or topic, jot down the muddiest or most interesting points of a lesson (Angelo & Cross, 1993; Craig, 1995), or record prior experiences and incoming knowledge on a topic. Critiques, abstracts, rebuttals, conferencing debates, guided question reflection logs, and case analyses also fall within the realm of critical thinking writing activities. Embedding these opportunities for reflection and summarization helps solidify student learning and restructure student knowledge (Bonk, Mulvaney, Reynolds, & Dodzik, 1996; Hidi & Anderson, 1986; Winograd, 1984).

Any activity wherein students identify main points, search for cause and effect, find patterns and relationships, rank ideas, develop timelines, build taxonomies or categorization schemes, draw comparisons and contrasts, examine costs versus benefits, or interlink ideas, certainly is a worthwhile exercise in critical thought. And, as noted below, such activities are even more intellectually valuable when students work in teams.

Cooperative and Collaborative Learning on the Web (See Table 3)

Given that team products can be displayed to the world, online learning environments such as the World Wide Web offer extensive opportunities for collaboration and cooperative learning (Harasim, 1990; Riel, 1990, 1993). Simple structures for cooperative learning in the traditional classroom have students turning to their partner and sharing ideas. Applying this concept to the Web, students might be assigned Web-partners for e-mailing their thoughts and ideas regarding questions raised by the instructor or one's peers. Or, perhaps, a learning team might share its ideas regarding interesting or complex classroom queries in a round robin fashion and then summarize its ideas for the entire class.

Another easy-to-implement and effective conferencing idea is the use of starter and wrapper roles to initiate and summarize discussion, respectively (Bonk, Appelman, & Hay, 1996). This activity could be embedded within satellite conferences or electronic cafes (for additional information on conferencing tools, see the chapter by Malikowski in this text or Chong, 1996).

As mentioned earlier, giving students roles for discussion also enhances their processing of material and the overall sense of interdependence and accountability among group members. Incorporating Johnson and Johnson's (1992) structured controversy approach on the Web may prove especially useful in addressing debatable or sensitive topics. In this method, pairs of students are assigned pro and con sides of a topic. Next, they become experts on the assigned topic by reading material referenced on the Web. After forming their opinions, groups argue out their sides of the topic and then switch roles and eventually come to a compromise position written up for the instructor.

A number of other generic cooperative learning methods are amenable to the Web. For instance, Group Investigation (Sharan & Sharan, 1976) and "Coop Coop" (Kagan, 1992) both involve students selecting topics and dividing these up into mini-topics for individual explorations. Later, this individual work is compiled and presented in a final report or presentation, wherein the instructor is the referee or critic (Harasim *et al.*, 1995). To foster further reflection

Table 3. Summary of suggested cooperative learning techniques for the Web.

<p>1. Partner Activities: Turn to Your Partner and: Share/Check Work/Review/Discuss, Think/Pair-Share, Peer Review/Edit and Conferences, Peer Interviews, Tell and Retell. (e.g., Please share with your assigned e-mail partner your brainstormed lists regarding how schools can be made more effective.)</p>
<p>2. Round robins and Round tables (Kagan, 1992). (e.g., I want your suggestions for handling the school restructuring case we just read. In a roundrobin fashion, I want each person in your group to add one idea and then pass the list on the next person in the group until your group has exhausted each individual's ideas. Then you are to rank the top five ideas of your group.)</p>
<p>3. Asynchronous Conferencing: Electronic Cafes, Satellite Conferences, Discussions Groups, Electronic Conference Starter(s) and Wrapper(s). (e.g., Listed below are the 15 discussion topics on school restructuring selected by the class. Please sign up to start or initiate discussion for one of these weeks and also sign up to be a wrapper of the class discussion for another week.)</p>
<p>4. Synchronous Conferencing. (e.g., This week we will be discussing school restructuring in a real-time conference with three well-known school principals. After this discussion, small groups will be formed to summarize the issues facing restructuring across these situations.)</p>
<p>5. Structured Controversy (Johnson & Johnson, 1992). (e.g., Pairs of students will be assigned to pro and con sides of a debate on any secondary school restructuring based on constructivist philosophy. After one week, these roles will be reversed. Next, a consensus paper will be written by your group.)</p>
<p>6. Group Investigation, Jigsaw, Coop Coop (Kagan, 1992). (e.g., We will divide school restructuring concerns into elementary, middle, secondary, and college levels. In groups of 4-5 students at each level, each student will select a minitopic in which to become an expert and share his or her findings with the group. Minitopics will be combined into a joint group composition or product.)</p>
<p>7. Value Lines and Graphs. (e.g., This week we will debate the utility of the APA's (1995) 14 learner-centered principles. First of all, student teams will rate the worth they place on each of these principles from 1 (low) to 10 (high) a value line. After the debate, each group will reconsider its ratings of these principles on a new value line.)</p>
<p>8. Project-Based Learning. (e.g., Each group of 4-5 students will create blueprints for the ideal high school. In your work, please detail your basic principles or tenets, goals and objectives, potential funding sources, timeline, implications, budget, marketing plans, etc.)</p>
<p>9. Gallery Tours (Kagan, 1992). (e.g., Each of the five cooperative groups in this class will create a Web page to display its ideal school. Peers, public school principals, and education professors will provide detailed feedback and later rate your Web pages.)</p>
<p>10. Other Group Activities: Team Competitions, Panel Discussions, Symposia, Debates, Team Concept Webs, Picture Making Exercises, Buzz Groups. (e.g., Panel discussions will be established based on areas where you feel you have gained some expertise during this course and where significant questions have been raised. Individual points will be awarded for depth, clarity, logic, and creativity.)</p>

and dialogue, each cooperative team might be forced to indicate its views or positions on a World Wide Web value line both before and after such cooperative projects.

The capabilities of the World Wide Web to display student text, graphics, animation, and sound may make it the ideal project-based learning (PBL) forum (Savery & Duffy, 1996; Williams, 1992). Gallery tours of student PBL products on the Web encourage student pride and ownership in the work. In addition to PBL, interactive activities such as panel discussions, symposia, team concept webs, and student team competitions might prove to be the real WBI success stories of the next century. Displays of course projects and team ideas from geographically and culturally diverse peers on the World Wide Web, nevertheless, will be confronted with questions concerning project organization, ownership, and assessment. Such considerations aside, the ultimate benefit here may be enhanced student collaboration processes as well as access to and interaction with mentors and peers on the Web.

Apprenticeship and Perspective Taking

As instructional strategies proliferate on the Web, course instructors must become conscious of how to apprentice student learning and enhance their perspective taking (Bonk, Appelman, & Hay, 1996; Harasim, 1993; Riel, 1993). However, fostering these opportunities remains the most culturally significant but least appreciated possibility of WBI.

A cognitive apprenticeship is a powerful instructional approach for building student thinking and teamwork skills. In accordance with this approach, the conferencing and collaboration technologies of the Web bring students into contact with authentic learning and apprenticing situations. Experts and learning guides might be available on the Web through "ask-an-expert," electronic mentorships, tutoring, informal peer interactions, student work groups, and other access to network resources (Harasim *et al.*, 1995). Dialogue processes between students and adult guides are hypothesized to move the learner from novice status to greater knowledge and skill of the discipline (Collins, 1990; Lave, 1991; Lave & Wenger, 1991; Rogoff, 1990). In recent electronic mentoring projects, student reception of ongoing feedback and support from meteorologists, explorers, or environmentalists brought students into contact with the community of practice and involved them in genuine data collection and reporting (Edelson, Pea, & Gomez, 1996; The GLOBE Program, 1995; Ruopp, Gal, Drayton, & Pfister, 1993; Songer, *in press*; Sugar & Bonk, 1995). As these expert resources multiply the pedagogic potential of every Web-based classroom, thoughtful consideration of one's instructional selections becomes increasingly crucial.

While instructors in WBI weigh the opportunities for cognitive apprenticeship, they might simultaneously consider how this teaching venue increases opportunities for students to take the position of another, since this skill is central to human intelligence (Bonk, 1990; Mead, 1934; Selman, 1971). The shared or common space (Schrage, 1990) created on the World Wide Web with conferencing tools, chat boxes, virtual whiteboards, opinion polls, and bulletin boards is prime real estate for cultivating knowledge negotiation and the gradual building of inter-subjectivity among participants. Given the emergence of such tools and resources, instructors must begin to locate and appropriately use strategies of instruction that tap into this perspective taking power source and push students to new heights of interpersonal understanding and global diversity appreciation.

Conclusions

With WBI, students now have new learning partners and learning materials for discovering, producing, and synthesizing knowledge. Given the endless WBI possibilities for higher-order

thinking, teamwork, and apprenticeship, there is perhaps no issue with more immediate ramifications than elaborating on Web-based instructional techniques and practices today. In fact, educational historians and cultural anthropologists may treat the proliferation of World Wide Web instructional tools and techniques as one of the most significant cultural advances of the next century!

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Acknowledgments

We would like to thank Jamie Kirkley, who helped create the URL related to this article (see: <http://cee.indiana.edu/bobweb.html>). We also are grateful to Padma Medury and Robert Fischler for their timely editorial advice and suggestions concerning this manuscript.

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Web-Based Instruction



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TICKIT Technology Integration Ideas
Brainstorming, Exploration, and Reflection Activity
Curt Bonk and John Keller, Spring of 2002

Technology Integration Idea	Currently Use (Check)	Pirate/Use in Future (Check)	Thinking Skills	TICKIT Example
1. Web Quests and Web Tours				
2. Videoconferencing Project Athena				
3. Writing: Electronic Newsletters, Peer Feedback, Book Reviews, Autobiographies				
4. Web Search and Exploration, Free Tools and Sites				
5. Web Editing and Publishing, School Web Site Design				
6. Pen Pals, Exchanges, Keypals, Impersonations, Electronic Appearances, TeleFieldtrips (GLOBE, Labnet, Kids as Global Scientists)				
7. Online Mentoring, Interpersonal Exchanges, Telementoring, Question and Answer Sessions, Guest Expert Chats				
8. Computer Conferencing, Discussions (e.g., Blackboard), Starter-Wrapper Technique				
9. Courses or Homework on Web				
10. Digitizing Images, Digital Camera use, Photoshop				
11. Movie Producing, Digital Video				
12. Presentation Tools like PowerPoint, Kid Pix				
13. Hypermedia and Multimedia (sounds, animations, voices, pictures, etc.), HyperStudio				
14. Simulations (e.g., SimTower)				
15. Online Cases				

16. Technology Demonstrations, Tech Fairs				
17. Inspiration and Concept Mapping Tools				
18. Online Evaluations and Tests, Web Surveys				
19. Word Processing				
20. Student Database Creation				
21. Adaptive and Assistive Technologies (screen readers, voice recognition software, Braille keyboards, screen magnifiers, trackballs, touch screens, alternative keyboards etc.)				
22. Spreadsheets and other Math Tools				
23. Produce Musical CD's, CD Burners				
24. 3D Worlds, Active Worlds				
25. E-mail				
26. Microcomputer-Based Labs (MBL): sensors, probes, motion detectors				
27. Hand-Held Devices, Graphing Calculators, Palm Pilots				
28. Participate in Online Conference, Sign Up for Listserv				
29. Post Exam Questions to Web				
30. One Minute Reflection Papers				
31. Create Online Glossaries				
32. Online Panel Discussions and Debates				
33. Online Voting or Polling				
34. Online Scavenger Hunts				
35. Online Role Plays				
36. Brainstorm Ideas with Chat Tool				
37. Use Lesson Plan Web Sites				
38. Make Web Link Suggestions for Class				
39. Electronic Portfolios				
40. Integrated Learning Systems (e.g., Jostens, WICAT)				



Can You Pirate?

Pirate

No Way

Maybe

Definitely



**1. Active Learning
Strategies:
Motivation.**

**2. Active Learning
Strategies: Creative
Thinking**

**3. Active Learning
Strategies: Critical
Thinking**

**4. Cooperative
Learning: General**

**5. Cooperative
Learning: Specific**

**6. Evaluation and
Assessment**

7. Next Steps

8. Summary

Final Curriculum Workshop Presentations

R546 (Bloomington and Indy via videoconferencing)
Instructional Strategies for Thinking, Collaboration, and Motivation
The Sometimes Honorable: Doc Curtis J. Bonk Presiding

NAME OF PRESENTER(S): _____, _____

Brief Presentation Title or Topic: _____

60 points: Scoring: (1-10) if for 60 points

Evaluation Criteria for Group Presentations:

- _____ 1. Organization of the presentation (flow, length, practiced).
- _____ 2. Topic stimulation (active engagement).
- _____ 3. Usefulness of materials (clear, practical, handy, relevant, informative, handout(s) provided).
- _____ 4. Knowledge of the topic (expertise, good ideas, insights).
- _____ 5. Scope of plans and curriculum impact (goals clear, important, appropriate, significant, doable).
- _____ 6. Effort (digging deep, extensive depth displayed here, work-work-work-work, persistence).

_____ Total Group Score

Special Comments/Suggestions/Interesting Points/Questions to Ponder/Other:

Signature: _____

Date: _____

R546 Presentation Peer Feedback Form

Name of Presenter _____

Topic/Title: _____

1. Positives in the presentation:

2. Minor suggestions for improvement:

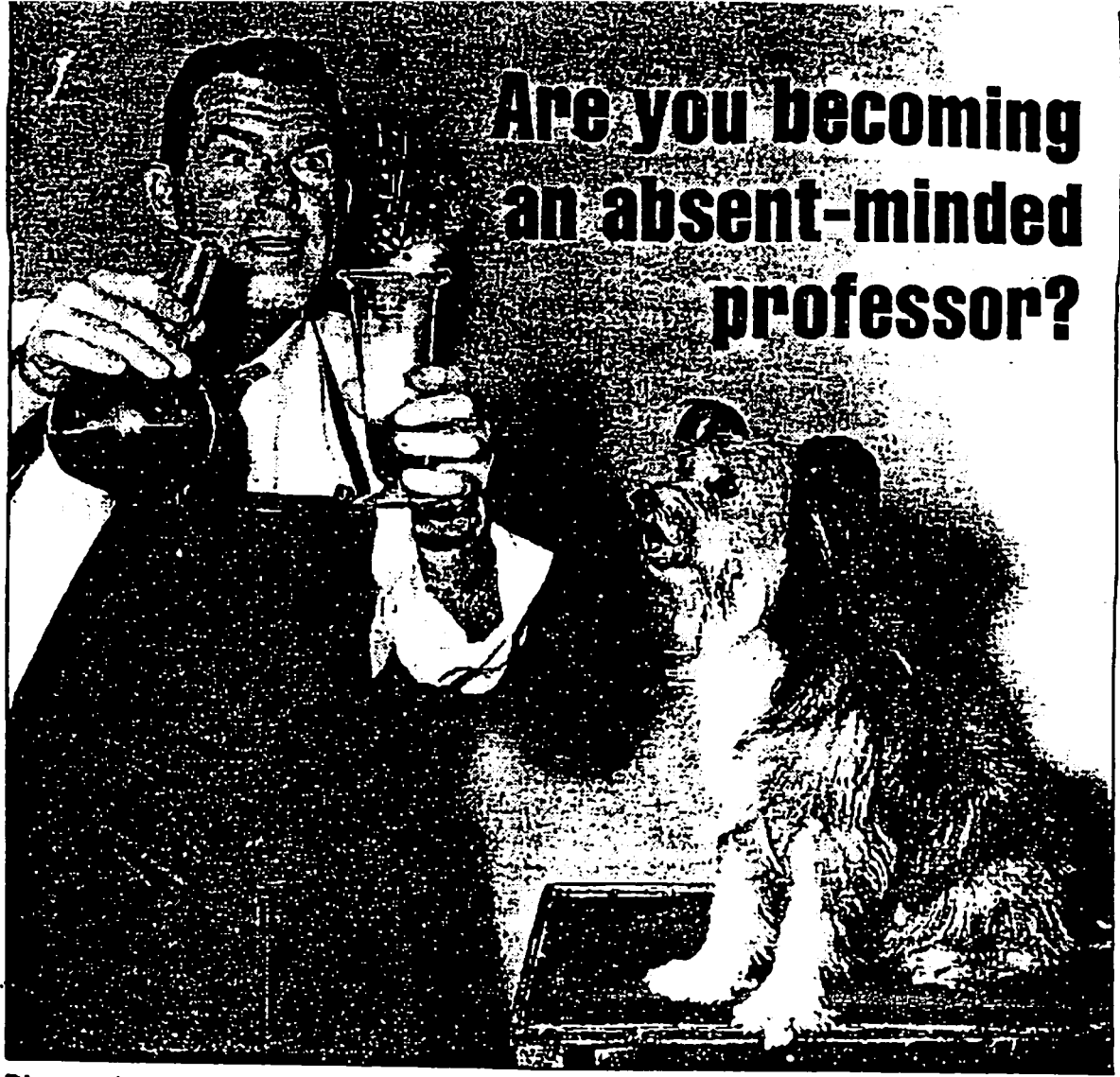
3. Interesting/Innovative/Intriguing Ideas:

4. Other comments:

Signature: _____

Date: _____

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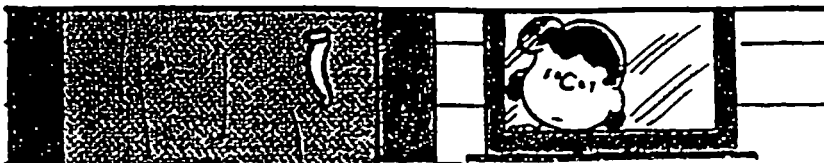


**Are you becoming
an absent-minded
professor?**

Disney classic: Fred MacMurray had the title role in "The Absent-Minded Professor."

June 18, 1945
Herald-Times

BY CHARLES SCHULZ



**EXCESSIVELY
WEIRD!**

Section on:

GOOD

AND

BAD

TEACHING



The Not-So-Mysterious Case of the Lousy Instructor

by Bruce R. Hitchcock

I remember it like it was yesterday.

"I think you'd better go see Mike this afternoon," Kerry said to me in the hallway.

"Why?" I asked. The look on her face and the tone of her voice gave me a bad feeling.

"Um...you'll have to see it for yourself. Just get in there, and soon." she replied and walked away shaking her head.

At the time, I was the lead technical instructor in the employee training department of a high-tech company. Mike was the newest member of our team, and he had just finished the morning session of his first class. (All names have been changed to protect the guilty, the innocent, and everyone in between.) As the lead, I was acting as a mentor for Mike and had helped him prepare for what would be his first-ever stint as a classroom instructor. Unfortunately, I was teaching that day myself and could not observe his debut.

But after Kerry's comments, I made sure to be present for day two. What I saw there is the stuff of training nightmares. Mike was the worst classroom instructor I had ever seen! And because I had been partially responsible for bringing him on board, the sting was doubly painful.

You may be thinking, "How bad could he have been?" Here's what I sat through that morning.

As the students arrived and settled into their seats, Mike was writing on the board and checking his notes. When it came time to start, he simply began talking. He didn't say, "Good morning. How is everyone today?" He didn't recap the previous day's material. He didn't ask if anyone had a question. He just started presenting the next module. It was as if he'd left off just a few minutes before. Needless to say, the students were stunned for a few moments. But they caught on quickly and opened their workbooks to follow along.

Over the next three hours, I watched as Mike demonstrated an unending string of bad teaching techniques. I'm not sure if he made every mistake an instructor can make, but he came close. Here's a partial list of Mike's mess-ups:

- Spoke in a monotone with no vocal inflection or emphasis
- Spent 20 minutes trying to get one student back on track while the rest of the class sat and waited
- Gave a long, rambling answer to a question that he should have handled out of class, because the other students were not interested
- Gave a long, elaborate answer to a question that should have been answered with a simple "Yes"
- Never emphasized the important points the students *really* needed to remember
- Never stopped to solicit questions
- Talked to the board, with his back to the class
- Failed to clarify a student's question, and therefore gave an answer that didn't match what was asked
- Read long passages word for word from the workbook or the computer screen

Now you're thinking, "You're right—he was really bad. But how did this clown get in front of a class in the first place?" The answer is simple: He knew the material. He was a top-notch programmer within the company and was looking for a transfer, a change of pace. As he was an expert on all the topics we were teaching and showed great enthusiasm and confidence, we gave him a chance. In 20-20 hindsight, this was obviously a mistake.

You may also be thinking, "Well, he just needed some work on presentation skills. If he knew the material, he could learn to be a good classroom teacher." As a veteran instructor, I can't help but shake my head whenever I hear this. Any good teacher knows there is more to teaching than making good presentations. Here are some points that make for good teaching:

- Controlling the pace (much more important for a multi-day session than for a one- or two-hour presentation)
- Making sure everyone is "getting it"
- Putting extra emphasis where it belongs
- Soliciting questions early and often
- Knowing when to encourage participation and when to let students sit and listen
- Understanding and accommodating different learning styles
- Understanding and answering questions (the key is to understand a question before you answer it)
- Knowing which questions to address outside class time
- Knowing when to spend time on a side topic, and when not to
- Having an available source for background information if you're not a subject matter expert (SME)

In real estate they say the three most important things are "location, location, location." Instructors should think, "preparation, preparation, preparation." Nothing is so crucial

to the smooth running of a class. I would expect any new instructor preparing to teach a course for the first time to ask all the following questions (and more):

- What is the hardest section?
- Where will the students likely get stuck?
- What are the most common questions they will ask?
- What's the most difficult question they are likely to ask?
- Which exercises need the most time to complete?
- What are the crucial points I should really stress?
- What can I brush over if I'm running short on time?
- Does the timing suggested in the instructor guide match reality?
- Does the course run long or short?
- Do you have any other good examples I can show them?
- Any good jokes I can throw in?

Getting back to Mike, he never asked me any of these questions. He asked *no questions at all* while preparing for the class, and still he felt he was fully prepared for his first solo flight. Not a good sign.

When I prepare course materials, I always include just these types of speaker notes both for my own benefit and for anyone who inherits the course. Most of these things only come from experience, so you need to take notes on the fly, and then transcribe them into a neat and readable format. These notes then become part of the instructor manual.

Another handy guide that all rookie instructors should have is a performance checklist. This would apply to any course and will list the "don't forget to do this" items that Mike was so negligent with. I would include the little things that are obvious to a veteran teacher, but that it never hurts to be reminded of:

- Introduce yourself and say "Good morning!"
- Remember to ask for questions frequently.
- Talk to the students, not the board or the computer screen.
- Recap and review often.
- Be smart in deciding which questions to answer in class and which to take off line.
- Clarify what a student is asking so you provide the right answer.
- Watch your pace, and keep the students informed of how long class will run each day.

You can include other items that are appropriate to your training situation.

What's interesting is that, before hiring Mike, all the instructors in our group had talked a lot about that eternal question: Do you hire people who know the material and then teach them how to teach, or is it better to hire good instructors and then have them learn the material? Or, as I put it, "Should we get a techie who's not a teacher, or a teacher who's not a techie?" Of course, you would like to have someone who is both an SME and a talented instructor, but

those are hard to come by. So where should you place the higher priority when you have to make that tradeoff?

Having gone through the experience with Mike, I know the answer now. Good instructors (and instructional designers) can learn almost any topic when given access to the right SMEs. But good classroom skills (or instructional design skills) are not so easily acquired. I believe this firmly and have never had reason to change my mind since that nightmare morning with Mike so long ago. Train-the-trainer sessions can help to some extent, but I still feel strongly that teachers can become techies much more easily than vice versa.

One final comment. Students will put up with lousy instructors. (In the case of Mike's mess, I think only one person did not finish the class.) They will sit through the boredom and confusion and not complain, at least until you put class evaluation sheets in their hands. Then watch out!

But why do they tolerate lousy instruction? It may be because they respect authority figures, which is how most of us view teachers. Or it could simply be low expectations. I'm sure you've had to sit through a day (or a week!) of some colossal waste of time inflicted on you by a terrible instructor. So when yet another one comes along, we sit and bear it. What a shame.

One improvement that is used by more and more companies is a mentoring program. Whenever I tell this story, the first question that comes up is, "Why didn't this guy have a mentor who gave him pointers, watched him do a run-through of the course, and provided lots of advice and feedback?" The simple answer is that no such program existed. In fact, the practice was not very common back then. If I were in that same situation again, I would never let Mike go in front of a class solo without lots of mentoring up front.

So let's all work to get the best possible instructors into those classrooms (whether live or virtual). Remember the three key areas: presentation skills, good training techniques, and preparation, preparation, preparation. Only with these can we improve the reputation of the whole training industry.

And if you see Mike, or someone like him, tell him to go back to programming. 🐛

Related Readings

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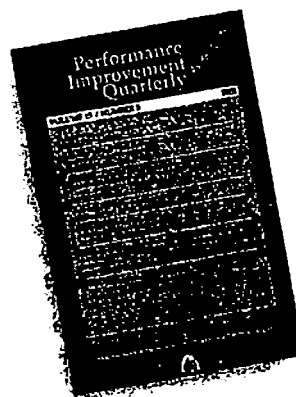
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Bruce R. Hitchcock's career includes stints as a classroom instructor, course developer, instructional designer, CBT/WBT author, product advocate, and high school math teacher (twice). The common thread in all this has been education and the appropriate uses of technology in training. Articles by Bruce range in topic from Lotus Notes to CBT techniques to management issues. He is currently developing tools for use in the math classroom. These are programmed with Flash and are delivered through standard Internet technologies.

Bruce received his BS from MIT and earned a Massachusetts State Teaching Certification. Currently he is "walking the talk" by pursuing his master's in Education entirely through online courses from Jones International University. His concentration is in e-learning. Bruce lives in the Boston area with his family and may be reached at Hitchco@attbi.com.

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
From the issue dated April 9, 2004

What Makes Great Teachers Great?

By KEN BAIN

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When Ralph Lynn retired as a professor of history at Baylor University in 1974, dozens of his former students paid him tribute. One student, Ann Richards, who became the governor of Texas in 1991, wrote that Lynn's classes were like "magical tours into the great minds and movements of history." Another student, Hal Wingo, an editor of *People* magazine, concluded that Lynn offered the best argument he knew for human cloning. "Nothing would give me more hope for the future," the editor explained, "than to think that Ralph Lynn, in all his wisdom and wit, will be around educating new generations from here to eternity."

What did Lynn do to have such a sustained and substantial influence on the intellectual and moral development of his students? What do any of the best professors do to encourage students to achieve remarkable learning results?

I and several colleagues from the Searle Center for Teaching Excellence at Northwestern University studied more than 60 professors from various disciplines to try to determine what outstanding teachers do inside and outside their classrooms that might explain their accomplishments. And when we examined in particular how good teachers conduct class, we found that they follow several common principles. Specifically, they:

Create a natural critical learning environment. "Natural" because what matters most is for students to tackle questions and tasks that they *naturally* find of interest, make decisions, defend their choices, sometimes come up short, receive feedback on their efforts, and try again. "Critical" because by thinking critically, students learn to reason from evidence and to examine the quality of their reasoning, to make improvements while thinking, and to ask probing and insightful questions. This is, by far, the most important principle -- the one on which all others are based and which commands the greatest explanation.

Some teachers create a natural critical learning environment within lectures; others, with discussions; and still others, with case studies, role-playing, fieldwork, or a variety of other techniques. The method of choice depends on many factors, including the course's objectives, the personalities and cultures of the teachers and students, and the learning habits of both. But an intriguing question or problem is the first of five essential elements that make up a good learning environment.

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Often the most successful questions are highly provocative: What would you do if you came home from college and found your father dead and your mother married to your uncle, and the ghost of your father appeared saying that he had been murdered? Why did some societies get in boats and go bother other people, while others stayed at home and tended to their own affairs? Why are some people poor and other people rich? What is the chemistry of life? Can people improve their basic intelligence?

The second important element is guidance in helping students understand the significance of the question. Several years ago, we asked Robert Solomon, a philosophy and business professor from the University of Texas, to talk about his teaching to a group of faculty members. Solomon called his talk "Who Killed Socrates?" and in that title captured much of the intellectual energy of his inquiry into Socratic pedagogy and why it isn't used much anymore. When we watched Solomon conduct an introductory philosophy class on epistemology, he simply stood before the freshmen and sophomores, looked them in the eye, and asked, "Does anyone here know anything for sure?" The way he asked the question gave it meaning. As students cast about for a positive answer, reeling in one solution and then another, they began to grasp the purpose of this modern inquiry. Once that happened, their learning could begin.

Many teachers never raise questions; they simply give students answers. If they do tackle intellectual problems, they often focus only on their subject and the issues that animate the most sophisticated scholarship in the field. In contrast, the best teachers tend to embed the discipline's issues in broader concerns, often taking an interdisciplinary approach.

When Dudley Herschbach teaches chemistry at Harvard University, he does so with a combination of science, history, and poetry, telling stories about human quests to understand the mysteries of nature. The lesson on polymers becomes the story of how the development of nylons influenced the outcome of World War II. He even asks his chemistry students to write poetry while they struggle to comprehend the concepts and ideas that scientists have developed.

Good teachers remind students how the current question relates to some larger issue that already interests them. When Solomon taught an advanced undergraduate course in existentialism, he began with a story about life under Nazi rule in occupied France in the early 1940s, reminding students that even ordinary activities like whispering to a friend could have had dire consequences in that police state.

Third, the natural critical learning environment engages students in some higher-order intellectual activity: encouraging them to compare, apply, evaluate, analyze, and synthesize, but never only to listen and remember. "I want the students to feel like they have invented calculus and that only some accident of birth kept them from beating Newton to the punch," Donald Saari, a mathematics professor at the University of

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the track toward this waiting tragedy, you notice a side track where you can steer the trolley car if you choose to do so. The only problem is that one man is working on that track and the train will undoubtedly kill him if it goes that way. What would you choose to do, he asks the students? Do you turn the car onto the side track, killing one person but saving five others? What would be most just and why? Often the students have no difficulty deciding that they would take out the one life to save the five others.

Sandel then introduces a wrinkle to the story. Suppose, he says, that you are not on the train but standing on an overpass watching it speed toward the five workers. As you watch this disaster in the making, you notice a large man standing next to you, also peering over the railing of the overpass. You quickly calculate that if you push this person over the railing, he will land on the track in front of the train. He will die, but his body will stop the train, saving five lives. Would it be just to give that person a shove?

In that exercise Sandel hopes to provoke students to think about fundamental issues of justice and understand their own thinking in relationship to that of some of the major philosophers. Throughout the course, he then embeds all the major philosophical schools and writers he wishes to consider in contemporary ideological battles intended to excite the students. His knowledge of the history of ideas helps him select the proper passage from Mills or Kant; his knowledge of and concern for the students help him select the political, social, and moral debates that will engage them. Equally important, he constantly changes the issues to fit new generations of students.

Most customary instruction follows an organization that stems wholly from the discipline, a set of topics and subjects that need to be covered. But many of the best teachers make a deliberate and carefully measured effort to confront some paradigm or mental model that students are likely to bring with them to class.

This idea of beginning where the students are rather than where disciplinary traditions might dictate has another influence on practices in the classroom: It leads to explanations that start with the simple and move toward the more complex. "If students have an understanding that is down here," Jeanette Norden explained, putting her hand close to the floor, "you don't start with something up here. Some medical students come in not even knowing what a neuron is -- a neuron is a cell in the brain -- so you have to begin with that simple notion and then you can build from there quickly."

Seek commitments. "I tell my students the first day of class that the decision to take the class is the decision to attend the class every time it meets," one professor explained. "I also tell them that my decision to teach the class includes the commitment to offer sessions worth attending, and I ask them to let me know if they think I'm not doing that."

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Highly effective teachers approach each class as if they expect students to listen, think, and respond. That expectation appears in scores of little habits: the eye contact they make, the enthusiasm in their voice, the willingness to call on students. It contrasts sharply with professors who seldom if ever look at their students, who continue on in some set piece almost as if they do not expect students to listen, and who never try to generate a discussion or ask for a response because they don't expect anyone to have any.

Help students learn outside of class. The best professors do in class what they think will best help their students to learn outside of class, between one meeting and the next. That approach is different from deciding to do something simply because it "covers" some subject, but it might lead to a variety of orthodox approaches: a demonstration that both confronts existing notions and provokes confrontation with new ones; a debate that enables students to practice critical thinking and to realize gaps in their own understanding and reasoning abilities; group work that asks students to grapple together and helps build a sense of community.

Because the best teachers plan their courses backward, deciding what students should be able to do by the end of the semester, they map a series of intellectual developments through the course, with the goal of encouraging students to learn on their own, engaging them in deep thinking. In ordinary classes, instructors might create assignments for students, but they rarely use the class to help students do the work.

Engage students in disciplinary thinking. The most effective teachers use class time to help students think about information and ideas the way scholars in the discipline do. They think about their own thinking and make students explicitly aware of that process, constantly prodding them to do the same.

Through such an approach teachers help students build an understanding of concepts rather than simply perform their discipline in front of them. While others argue that students must learn (memorize?) information first and use reasoning only later, the professors we studied assume that learning facts can occur only when students are simultaneously engaged in reasoning about those facts.

In class, they might engage students in a highly interactive "lecture" in which they present a problem and coax students into identifying the kinds of evidence they would need to consider to solve that problem and how that evidence might be gathered: "Here's the evidence we've encountered thus far; what do you make of it? What problems do you see? What questions would you ask about this evidence? What evidence do we need to answer those questions, and how will we find or collect that evidence?"

Create diverse learning experiences. "The brain loves diversity," Jeanette Norden told us repeatedly. To feed that appetite, she and other outstanding teachers conducted class in a multitude of ways. Sometimes

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

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The Chronicle Review

From the issue dated May 21, 2004

In Praise of Passionate, Opinionated Teaching

By MARK OPPENHEIMER

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Americans dissatisfied with higher education typically have one of two gripes. Either the problem is the curriculum, which might be too liberal or too conservative, too changeful or too stodgy, too current or too retrograde, too utilitarian or too useless; or the problem is the university's structure, which often is deemed too businesslike and soulless.

The first critique, the curricular one, began to surface in the United States in the 19th century, when colleges moved gingerly away from classical and seminary curricula toward the liberal arts, and then began to integrate with technical and scientific schools. Most anxiety about higher education today remains focused on curricular matters: what books are required to be read.

The second critique, that universities are run like businesses, also is not new. In 1927 the historian Bernard DeVoto wrote in *Harper's Monthly* about a student who had written a letter explaining his disillusionment with traditional schooling. "I have learned," the anonymous boy wrote, "that running a university is a damned good business and the most respected con-game in the world."

While the first critique was popular in the 1980s, when it ignited debates about the canon and political correctness, the second is in vogue now. Universities do appear more than ever like large companies, as they seek to patent inventions and team up with biotechnology firms, become more revenue-driven, engage with student and faculty unions, and employ "vice presidents for finance" and the like.

Both of those critiques are important, but they are trivial in comparison with my chief complaint: that college and graduate-school teaching is quite bad, and bad in a particular way.

Leaving aside for the moment my ornery opinion, it is fascinating to note that discussions of pedagogy are relatively rare in higher education. Even though pedagogical matters dominate debates about elementary and secondary education, practically to the exclusion of curricular content, they are considered beneath the dignity of the academy, for two reasons.

First, scholars tend to assume that it is their scholarship that matters, and that fine teaching will flow necessarily from their knowledge of the

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subject matter. The fact that tenure decisions depend mostly on published output reinforces the belief that scholarship is primary.

Second, and more important, a consensus exists about what college pedagogy consists of: seminars, in which the professor's job is to elicit active student participation, and lectures, in which the professor delivers salient information in a relatively unbiased way, explaining difficult concepts, perhaps offering an interpretation of the facts but not advancing a strong polemic. While some institutions have experimented with small tutorials, following the English model, seminars and lectures remain standard in the American academy.

Here is the problem: As now practiced, neither the seminar nor the lecture encourages strong disagreements, whether between students and the professor or among students themselves. Seminar pedagogy tends to suppose that all opinions are equally valid, that "there's no such thing as a stupid question." Lectures, even when they are strident or opinionated, do not really allow for responses. This means that the average student graduates without ever having seen a good, knuckle-baring academic brawl. She has never heard one professor insult another, never heard a professor tell a student that his misunderstanding of the facts could have real consequences.

I find this fact extraordinarily sad. Disagreement is a prime engine for advancing human knowledge -- and besides, hearing boldly stated opinions is tremendous fun. For smart students to feel challenged, and for dull students to lose their cobwebs, they need to learn that academic subjects are both a matter of grave moral concern and a source of exhilaration, worth becoming overheated about. They learn this not by being invited to care, but by watching professors who manifestly do care. For the college professor, the proper pedagogic role is not as facilitator, coaxing children into thinking, but as role model, showing young men and women what a thinking mind looks like.

My suggestion that professors are too mild, not sufficiently opinionated, may at first sound ludicrous. It is well known that professors take their fields too seriously. They are too inclined to think that second-century Roman coinage is a matter of ultimate concern, too willing to end friendships over what Willa Cather's lesbianism might mean for her depictions of wheat fields. But while professors may get contrary at conferences and in journal articles, those same professors are often profoundly milquetoast in their classrooms, so eager to get in opposing points of view and to assure students that no opinion could be wholly wrong that they forget to have opinions themselves.

Yes, some professors are known for "advancing an agenda," which is thought to be a bad thing. But for the most part, they hold to the well-meaning liberal dogma that students ought to figure things out for themselves. That leads to the kind of teaching that all of us dread and yet engage in: "Very good. I see where you're coming from. Now, does anyone have another point of view?"

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Younger children, of course, are often the first to notice a naked emperor. When I taught high school, some student would raise her (usually her) hand and say, "Why do you keep asking us what we think? You're supposed to be the expert." Or an even more direct challenge: "Why are you asking us what Poe means here? Don't you know?" She was making two points: first, that my dishonesty in pretending not to know the answer, and in turning to them for "help in figuring this poem out," is an insult to the students, who know what game is being played and feel cheapened by having to join it; and second, that I as the teacher probably have more to teach them than they have to teach each other, and that their time would be more profitably spent listening to my answers -- or, if I have no certain answers, listening to me work through possible answers. Watching my mind publicly at work would teach them how to think better than would my asking them to flail about.

And yet this pedagogy of pretense gets more ingrained in college and is at its worst in graduate school. I actually had some wonderfully didactic teachers in high school, fewer in college, and almost none in graduate school, where the rule seemed to be that any expression of opinion on the part of professors would necessarily inhibit the graduate students, who were to be treated as budding scholars with equally valid opinions. Thus were we reduced to the absurdity of watching a world expert on, say, Russian history or African slavery asking us what we thought. While the professor thinks she is honoring her students by giving them the freedom to form their own opinions, she is condescending to them instead, by denying the possibility that they might be able to hear what she really thinks and still come to their own conclusions.

The classroom has been brought low this way by a combination of factors. Chief among them are a misreading of Socrates, thought to have been a mere asker of questions (even as his interlocutors always happened to arrive at the answer he hoped for); the progressive-education pedagogy, which has been ascendant at least since Dewey, Montessori, and the "child-centered classroom"; the political-correctness vogue of the 1980s and '90s, which could make it seem professionally unwise to hold certain opinions; and the mushy '70s value we call "consensus," a noble ideal that unfortunately is of little use in the hunt for truth.

Add, too, the niceness of American culture, where politesse and chumminess are essential values of manhood, and grace and charm of womanhood. Like our congressmen, who conceal their opinions behind cloaks of disclaimers and inarticulateness, and who thus appear invisible alongside the lusty swashbucklers of the British Parliament, our professors are afraid to say anything vexing or controversial. Forgive the male metaphor, but, in their classrooms at least, American professors have been neutered.

People often say that they remember the teacher in sixth grade who really drilled grammar into them: "I resented her then, but she gave me a gift that has lasted a lifetime." They remember her because she gave them the tools that served them so well in later classes. But I think they

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value her for another reason as well. Her commitment to good grammar (or correct spelling, or proper algebraic technique) represented more than just a utilitarian gift: It represented commitment to a principle. "Grammar matters," she was saying, or "algebra matters." And that commitment to principle is ennobling and pedagogically exciting even if the principle is unsound. Even if we decided, for example, that standard written English was a racist, imperialist, and nonsensical paradigm, it is still invigorating and exciting to have a teacher who holds a wrong opinion strongly. The teacher's conviction touches that place in the human soul that hungers for purpose.

Ask yourself this question: Will a student learn more from a teacher slavishly devoted to "good grammar," who spends his time excoriating its foes and in so doing teaches students both sides of the debate, or from the teacher who simply refuses to teach grammar at all? I should think that both pro- and anti-grammar ideologues would prefer the first teacher, who in his way has brought his students into the debate and given them the tools to think critically about it.

The caveat is that such teachers must ensure that they hold their opinions with enough humility so that they can allow students the freedom to disagree -- therein lies the difference between pedantry and pedagogy. Saying what we believe to be right does not preclude the epistemic humility to accept that we might be wrong.

Nowadays it is the conservatives who are more likely to grab a classroom by its lapels and shake it into an enjoyable combativeness, because the conservatives are the ones on a mission. Once upon a time the Marxists were, then the queer theorists were, but now the conservatives are the outsiders -- in academe, anyway. And for their rabble-rousing, they remain unpopular. Harvey Mansfield, a government professor at Harvard, has been publicly accused of being sexist. Donald Kagan, a classical historian at Yale, was derided as a troglodyte for his defense of the Western canon. But the quality I am talking about can just as easily be found on the left, and probably best of all in the irreducible middle, or in the no man's land of eccentricity.

I once had a conversation with the editor and writer Adam Bellow about the computer scientist David Gelernter, one of whose books he had edited, and who had been among my favorite college professors. Gelernter taught a class called "Computer Science and the Modern Intellectual Agenda"; the syllabus dealt generally with questions about the limits of computers, about what computers could not do.

I took the class during my last term of college, in the spring of 1996, when the dot-com boom was flourishing and many smart people seemed to believe that computers would soon do everything, including the dinner dishes. Gelernter tried to be objective, but I am glad to say that he failed. His readings and lectures made it apparent that he feared that his students would place undue faith in technology, and that such faith would diminish our lives by making us less attentive to family, church, and simple pleasures.

The class profoundly transformed my thinking, but at the time I could not say why. It was my first exposure to genuine skepticism and, in a sense, to conservatism: Although I had read Burke, I had never before understood his warning that forward-looking be tempered by a reverence for the accumulated wisdom of the ages. Yet something more affected me, something about the style of thinking that Gelernter modeled. Bellow told me that it was quite simple: "David is an intellectual obsessive."

Bellow did not mean that entirely as a compliment. He agreed with me that some of the screeds Gelernter published in conservative magazines were somewhat ill tempered, and that he often set up straw men to knock down with unsavory glee. But Bellow convinced me that what Gelernter had, which many professors did not have, was an ability to fixate on an idea and become animated by it. Gelernter believed in the power of intellection to change the world, which is another way of saying that he is an intellectual -- so much of one that the actual content of his ideas might be of secondary importance. He believes in ideas, and for their sake he does not mind being gloriously, loudly wrong.

It occurred to me sometime after my conversation with Bellow that the three best professors I had in college were all intellectual obsessives, men who believed that ideas were to be held, not just curated. For the philosopher Nicholas Wolterstorff, the idea was the Christian God and what it meant to worship him. For the late classicist Thomas Gould, who taught my introduction to ancient philosophy, the idea was atheism; he was as desperate to save us from Christianity as Wolterstorff was to follow its truth to distant corners.

Gould once handed out a copy of his unpublished paper "The Logical Superiority of Atheism to Agnosticism" -- the title gives one a sense of how powerful was his allergy to religion. In the last conversation I had with Gould, he remarked how happy he was that his fellow classicist Allan Bloom had died; Gould loathed the philosophy of Leo Strauss, and was always cheered by the death of one of Strauss's followers.

Imagine that -- telling a student he was happy that another scholar had died! How rude! But how radical -- here was a man who believed that ideas mattered that much. And for Gelernter, a religious Jew, what mattered was giving his students the tools to resist false idols, like technology or, it seemed, feminism. How he got his animus against feminism (and the 1960s, and liberals more generally) I will never know, but the intellectual tools he used to fight his battles are worth emulating, even if his battles were hardly worth winning.

Intellectual obsessives have points to make, and if these three had religious (or atheistic) fervor for their points, it was the students who gained. In a sense, teachers have to believe that they are saving souls, or at least pretend to believe it. If academics truly believed that the proper reading of Austen or Cather is of ultimate concern, they should have the courage to convince their students, not just their colleagues. I generally

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assume that the average mail carrier has a dash of Newman in him (Newman being the *Seinfeld* character who megalomaniacally declared, "He who controls the mail controls everything!"): He believes that his job matters, a lot. Professors should feel the same way: not just that teaching matters, but that teaching a certain point of view, at a certain time and place, can have good consequences, and may in fact be necessary.

That view does not reject the goal of getting students to "think for themselves," but it recognizes that students may learn to think for themselves by watching a judicious, judgmental mind at work. The decision that convictions are worth holding precedes, and animates, the student's quest for the tools to form such convictions. We want to open students' minds, but we also want them to see that after they gain a certain intellectual maturity, their minds will close, somewhat, for that is what it means to hold beliefs. Far better, then, that students be exposed to professors who, in their wisdom, actually have some beliefs. If, on hearing what their professors think, the students disagree, then they can argue back. And isn't that what we really want?

Mark Oppenheimer has taught American religion at Wesleyan University and Stanford University. He is the author of Knocking on Heaven's Door: American Religion in the Age of Counterculture (Yale University Press, 2003) and of a book about bar mitzvahs and bat mitzvahs in American culture, to be published next year by Farrar, Straus & Giroux.

<http://chronicle.com>
Section: The Chronicle Review
Volume 50, Issue 37, Page B7

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How does the ~~TAA~~ of Teaching relate to your teaching style?

Hi Listers,

I came across the Tao of Teaching and thought that much of what is stated here applies to the "art" of collaborative learning/teaching. I would love to hear your comments about the philosophy outlined in the statements presented below and their relation to CL.

THE TAO OF TEACHING

The Tao of Teaching, by Greta Nagel, New York, Donald I. Fine (Primus Paperback), 1994 ISBN 1-55611-416-8 (hardcover) 1-55611-415-X (paper) Adapted from "Tao Of Leadership", John Heider, Bantom Books, 1985

- * A wise teacher lets others have the floor
- * A good teacher is better than a spectacular teacher. Otherwise the teacher outshines the teachings.
- * Facilitate what is happening, rather than what you think ought to be happening. Silence says more than words, pay much attention to it.
- * Continual classroom drama clouds inner work.
- * Allow time for genuine insight.
- * A good reputation arises naturally from doing good work. But do not nourish the reputation, the anxiety will be endless; rather nourish the work.
- * To know what is happening, relax and do not try to figure things out. Listen quietly, be calm and use reflection.
- * Instead of trying hard, be easy; teach by example, and more will happen.
- * Trying to appear brilliant does not work.
- * The gift of a great teacher is creating an awareness of greatness in others.
- * Because the teacher can see clearly, light is shed on others.
- * Teach as a leader and a yielder. Constant force and intervention will backfire as will constant yielding.
- * One cannot push the river. A leader's touch is light. Making others do what you want them to do can become a failure. While they may momentarily comply, their revenge may come in many forms. This is why your victory may become a loss.
- * To manage others lives takes strength, to manage your own life is real power. Be happy and content at peace with yourself.

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- * Any over-determined behavior produces its opposite.
- * The wise teacher does not make a show of holiness or pass out grades for good performance. That would create a climate of success and failure. Competition and jealousy follow.
- * The wise teacher does not try to protect people from themselves.
- * Learn to be open and receptive, quiet and without desires or the need to do something.
- * The wise teacher keeps egocentricity in check and by doing so becomes even more effective.
- * Allow regular time for silent reflection. Turn inward and digest what has happened. Let the senses rest and grow still.
- * If you measure success in terms of praise and criticism, your anxiety will be endless.
- * Do not lose sight of the single principle: how everything works.
- * Forget those clever techniques and self-improvement programs, and everyone will be better off. If you wish to improve yourself, try silence or some other cleansing discipline that will gradually show you your true selfless self.
- * The highly educated teacher tends to respond in terms of one theoretical model or another. It is better to simply respond directly to what is happening here and now.

+++++

The Scholarly Lecture: How to Stand and Deliver

By William Germano

IT'S CONFERENCE SEASON AGAIN. All over academe, thousands of unsuspecting papers will make their way to the front of the lecture hall, where they will be read badly by scholars to fellow scholars who, slumped and glassy-eyed, will be wondering how late the dry cleaner stays open or whether *The Sopranos* is on that night.

It's a peculiarity of scholarly life that everyone is expected to be able to deliver a lecture well, but almost no one is trained to do it. Academe resists the idea that the teacher is a performer, but the classroom and lecture hall prove that, like it or not, you need performance skills to get your ideas across.

Once upon a very long time ago, educated people studied rhetoric and oratory. When they spoke, people listened. There are remnants of oratory even in our own time. You may not have liked Mrs. Thatcher, but she knew how to speak. You may not have liked Mr. Clinton, either, but what president has loved public speaking as much as Bill did? Of course, comparing politicians and scholars is a bit unfair. World peace is one thing, but no chief executive has had to hold an audience's attention with a paper on small notes in Haydn or character development in the novels of Jean Rhys.

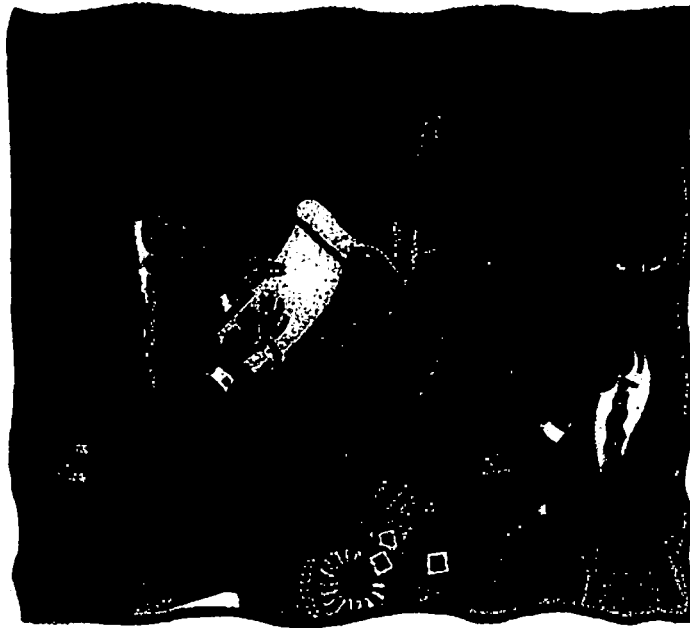
Most problems that beset academic lectures aren't specific to the scholarly world, but saying that they're common isn't the same as saying that they're easy to ignore. Here are a baker's dozen survival tips for academic speakers:

Remember that people who show up to hear you want to believe that you're smart, interesting, and a good speaker. Whatever you've got to say, say it with conviction. If you don't entirely believe in yourself, try believing in others' belief in you. An academic audience wants its speaker to succeed.

Before you get up to speak, be sure you're well hydrated (you need that for your vocal cords) and have made a stop. Even if your talk is only 20 minutes, you could be seated on a dais for a three-hour panel. It can be an uncomfortable three hours if you're worrying about when you can get to the restroom.

Have water beside the podium, but don't drink unless you have to. If you do, use a glass. Don't swig from a bottle. You may be one of those people who wouldn't dream of crossing a street in Manhattan or Hyde Park without a bottle of spring water in your backpack (you never know when the sand dunes might blow up and leave you stranded), but the podium isn't the place. Bottles, hip flasks, and Slurpee cups look unprofessional.

Technology is a tool, but a tool is not a friend and is often a rival. Unlike your audience, machines don't wish you well. Use as few gizmos as possible, and then check everything to be sure everything's in working order. Don't try out a complex set of visuals for the first time



BOB BOULE FOR THE CHRONICLE

when giving an important lecture. Consider, too, that some great lecturers don't want any visuals at all, since those lovely pictures in a darkened room draw attention away from the speaker herself (By the way, if you're speaking in a room with a blackboard, be sure to erase it clean. If your lecture begins to falter, your audience may focus instead on chalk scribbles and what they can remember of quadratic equations or the Russian patronymics in Dostoyevsky.)

PowerPoint is for sissies. All right, not for sissies, exactly, but it's being done to death. PowerPoint Makes Everything Really Important in a Telegraphic Way. That's Fine in Some Cases, But It Gets Tiring When It Happens Too Much. Besides, PowerPoint is the triumph of the quick "fact" over the art of argumentation. And a lecture is, or should be, a kind of argument. It's more, too—a chance to observe a voice, a body, a brain, and a personality engaging an audience with similar interests. If you put your bulleted ideas up on slides, your audience will look at the slides, not at you. You'll also be teaching them that What You Have to Say Can Be Summarized in a Few Words. Can it?

A lecture isn't a casual conversation. The larger the audience, the less casual it is. When you get up there, don't rattle through what you've written as if you were on the phone or face to face with an old friend. That's *talking*. When you're in front of an audience, you're doing something else. It's called public *speaking*—not public *talking*—for a reason. So speak slowly and clearly. E-nun-ci-ate. And if you can't speak clearly, at least speak slowly.

Look at your audience frequently. Disappear into your page and your audience will wander off, at least mentally.

(The bravest will simply get up and walk out.) Remember to smile. If that's hard, try a gentle expression of nonspecific pleasantness from time to time. The audience wants to like you.

Don't hook the air with your fingers to indicate that you're quoting someone. Tell your audience that what follows is a quotation, and then modulate your voice so they know when the passage begins and ends. Master this technique and you'll be able to read quotes without looking like your marionette just fell down.

Don't read aloud subheads or part numbers that may divide up bits of your lecture. This only makes your audience suspicious that the paper is so poorly organized that its structure couldn't possibly be understood otherwise. In most cases, a speaker who announces, "This paper is in six parts" hasn't thought enough about the paper's shape. Your paragraphs should press forward, taking the listener along without your calling out the mileage markers.

The printed page is different. Scholarly prose can often be usefully interrupted, and shaped, by subheadings. But even if you're planning to publish your lecture, skip them when you're delivering the text live. Ditto for epigraphs.

Never, ever, ever interrupt your lecture to say, "I'm going to skip some pages here in the interest of time," or, "In the longer version of this paper, I will explain..." Both are discourteous to the people in your audience, who could easily be doing something else with the time spent listening to you. Write your paper to fill the minutes you have been asked to speak. Don't run over. Don't run wildly short. A 20-minute talk is around 10 pages long. It's never 35 pages long.

Don't apologize for your lapses as a speaker, for the paucity of your research, or for the fact that you couldn't get your hair cut that month. As has been said, if you can fake sincerity, you've got it made. When you're giving a paper, you might need to fake a degree of confidence that you don't actually possess at the moment, but you need that appearance of confidence—and your audience needs it from you, too.

Rehearse, rehearse, rehearse. Then stop. Write your lecture well in advance of the event, so that you have time to practice reading it several times. Stand in front of a mirror, time yourself, and listen to your text over and over it becomes a kind of song that you can now interpret; you find places where you want to speed up, slow down, brighten your voice, stress words, even where you want to steal a glance at your audience.

When your lecture is finally revised and well practiced, declare the text finished. Lots of academic papers become worse during plane trips to the meeting and in hotel rooms the night before the presentation itself. A good night's sleep will help your lecture more than a tumble with Roger's *Thesaurus* at 4 a.m.

Prepare yourself in advance for questions. And, speaking of sleep, people who doze through papers are often freshly attentive for the question period. Always keep in readiness something you might want to add as a supplement to your talk: a witty anecdote, a piece of research that didn't get into your paper, or maybe your (prepared) impromptu thoughts on directions for further research. If you're faced with a question you can't answer, answer one you can ("Speaking of that, I'd like to share with you this story, which helps clarify what we're discussing here today.")

Expect that at least one person in the audience will ask something truly strange. Always respond courteously, and don't be afraid to say that you would have to give it more thought before replying.

If you're not the only speaker, listen to the others. Be a good guest. Sit quietly without fidgeting. Take notes if you like, but pay attention, or at least look like you're paying attention. Remember that people in the audience can always see you.

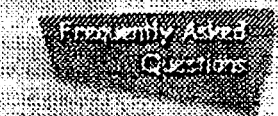
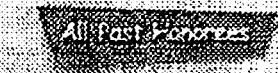
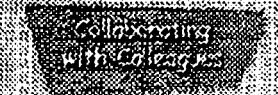
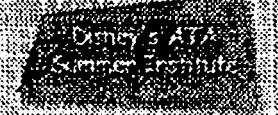
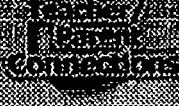
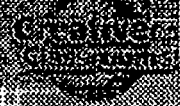
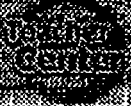
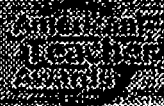
Now you're all set. You'll watch other speakers as they make their mistakes. You, you'll never make them again, or so you tell yourself. Actually, you will make them again, at least from time to time, because we all do.

One more thing—and you knew I would say this—get out there, have fun, and try to relax.

William Germano, vice president and publishing director at Routledge, is the author of Getting It Published: A Guide for Scholars and Anyone Else Serious About Serious Books (University of Chicago Press, 2001).

Use as few gizmos as possible. (PowerPoint is for sissies.) Don't apologize for your lapses as a speaker. Do go to the restroom before a three-hour panel discussion.

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Honorees in Action

What is it that makes our Honorees so special? It's their exciting, innovative teaching methods and strategies. Click on the pictures below to find out more about three of our Honorees and what they are doing to help their students succeed:



Bill Coate

Bill calls his teaching approach "The Madera Method" because it focuses on the history of Madera, CA. His students research the lives of Madera's founding pioneers, bringing history to life before their eyes.

Brenda Goldstein, Andrew Lucia, and Vonneke Miller

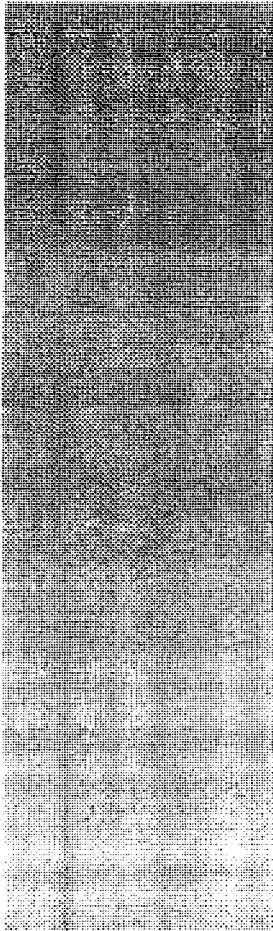


The ASTRO-1 Team

Brenda, Andrew and Vonneke see science as the "hook" they can use to get students interested in learning. This team believes that together, using themes related to space, they can help each student reach for the stars.

Catherine Harper

Sometimes the most important lessons are learned outside the classroom. Honoree Catherine Harper traveled to Japan to find out how Japanese



education methods
compare to the
American approach.

To request a copy of the first two volumes in The Creative Classroom Series, including videotaped vignettes from the classrooms of several American Teacher Awards Honorees, [click here](#).

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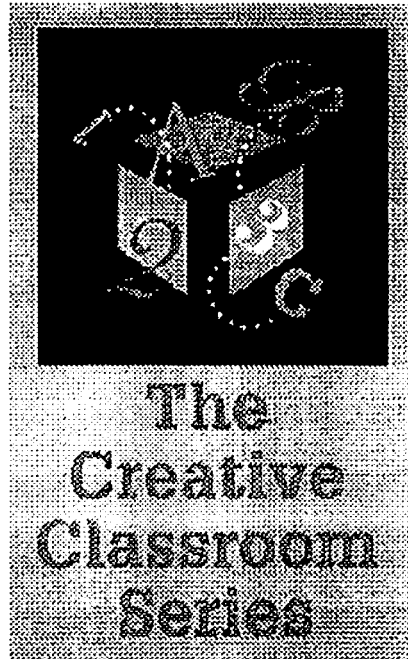
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RESOURCES

CREATIVE CLASSROOM SERIES

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As a part of its mission to support creative teaching strategies, Disney Learning Partnership has joined with Harvard Project Zero to produce The Creative Classroom Series, representing the joint thinking and voice of both our organizations. Each volume in the series includes a video showcasing the classrooms of award-winning teachers and an educator's guide - these materials are available free of charge.



Volume 1 of The Creative Classroom Series, "Creativity in the Classroom: an Exploration," serves as a starting place for both individuals and groups of teachers to discuss what constitutes a creative classroom and reflect on their own practice. In a field where practitioners seldom are able to visit and learn from one another's classrooms, this video and guide give a unique glimpse into the work of teachers and a useful prompt for substantive discussions of teaching and learning. The examples of practice and discussion of teaching presented in the materials are designed to explore four key questions:

- What is a "creative" classroom?
- What do teachers in creative classrooms do?
- What do students get out of being in a creative classroom?
- What can I do to develop a more creative classroom?

"The Power of the Creative Classroom," Volume 2 of the Series, goes into further detail examining the many ways students benefit from a creative learning environment and provides a "virtual visit" to the classrooms of several 1999 Disney's American Teacher Awards Honorees. "The Power of the Creative Classroom" is designed to help teachers explore the ways in which engaging approaches to learning and a collaborative school climate can enhance student learning. Teachers using the materials can experience Leslie Revis' approach to teaching high school foreign language with methods more commonly used in Kindergarten classrooms, travel to Mars with the

middle school students in Paul Crips' science class, or check out the innovative methods of several other Honorees. As in Volume 1, the accompanying educator's guide can help individual educators or those working together in a joint exploration to apply what they see in these classrooms to their own teaching. The guide also includes a discussion of protocols and how teachers can collaborate through looking at student work with the goal of improving assignments and student outcomes.

If you would like to receive a copy of "Creativity in the Classroom: an Exploration" and/or "The Power of the Creative Classroom" for your school, please send a letter on school letterhead, briefly explaining how you would use the materials for professional development, to:

**Creativity in the Classroom
c/o Disney Learning Partnership
500 South Buena Vista Street
Burbank, CA 91521-7766**

If you would prefer, you can also e-mail your request to us at Learning@DisneyHand.com.



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CHART OF LESSON DESIGNS

Chapter 17: Mastery Designs

Color-Coded Co-op

Cards 17:1

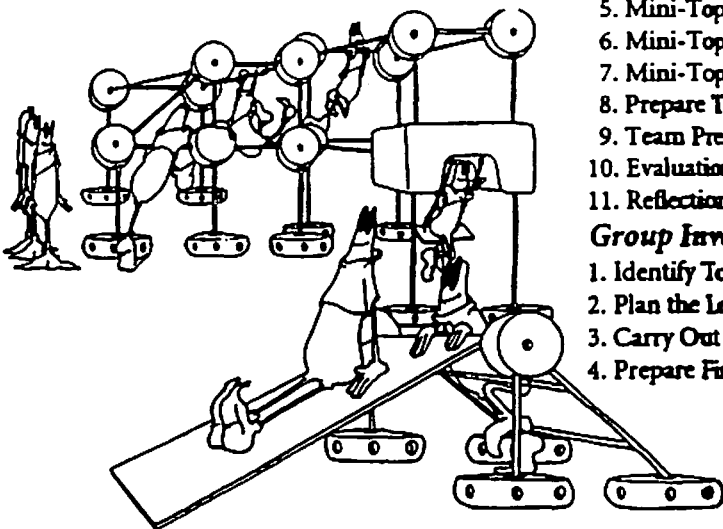
1. Pre-Test
2. Create Cards
3. Flashcard Game
4. Practice Test
5. Count Improvement Points
6. Flashcard Game
7. Final Test
8. Final Improvement Scoring
9. Individual, Team & Class Recognition
10. Reflection

STAD 17:6

1. Direct Instruction
2. Group Work for Practice
3. Individual Quiz
4. Improvement Scoring
5. Team Recognition

TGT 17:10

(Same as STAD except Tournament replaces Quiz, and points are based on out scoring others.)



Chapter 18: Division of Labor Designs

Telephone 18:1 **Partners** 18:1

1. A Student Exits Room
2. Remaining Students Instructed
3. Student Returns
4. Returnee Instructed by Teammates
5. Returnee Tested

1. Form Partners Within Teams
2. Class Division
3. Materials Distributed
4. Partners Work
5. Partners Consult
6. Partners Prepare to Present
7. Teams Reunite
8. Partners Present & Tutor
9. Reflection
10. Individual Assessment

Jigsaw II 18:15

1. Direct Instruction
2. Expert Topics Assigned
3. Expert Group Work
4. Experts Teach Teammates
5. Individual Quiz
6. Improvement Scoring
7. Team Recognition

Chapter 19: Project Designs

Co-op Co-op 19:1

1. Class Discussion
2. Team Selection
3. Teambuilding/Social Skill
4. Team Topic Selection
5. Mini-Topic Selection
6. Mini-Topic Preparation
7. Mini-Topic Presentation
8. Prepare Team Presentation
9. Team Presentations
10. Evaluation
11. Reflection

Co-op Jigsaw 19:10

1. Expert Topics Assigned
2. Expert Group Work
3. Experts Return, Share, Tutor
4. Prepare Team Presentation
5. Team Presentations
6. Check for Connections
7. Evaluation
8. Reflection

Group Investigation 19:10

1. Identify Topic; Team Selection
2. Plan the Learning Task
3. Carry Out Investigation
4. Prepare Final Report

Rotation Learning

Centers 19:16

1. Monday: Input
2. Tuesday: 1st Learning Center
3. Wednesday: 2nd Learning Center
4. Thursday: 3rd Learning Center
5. Friday: Integration & Assessment

Chapter 20: Multi-Functional Frameworks

Effective

Instruction 20:3

1. Anticipatory Set
2. Instructional Input
3. Check Understanding
4. Guided Practice
5. Closure
6. Independent Practice

Johnson &

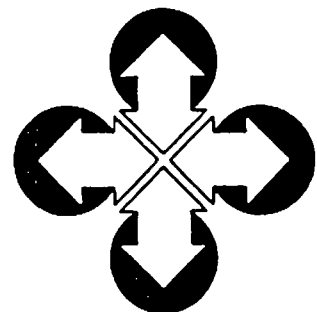
Johnson 5:9

1. Direct Instruction of Content
2. Teach Social Skills
3. Students Work in Groups
4. Teacher Observes for Social Skills & Content
5. Process Social Skills & Content

Big Four

..... 20:18

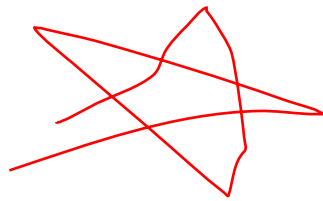
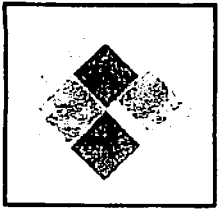
1. Class Building
2. Teambuilding
3. Mastery
4. Thinking Skills



Section on:

Extra Handouts

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Interactive Lectures

Summaries of 36 Formats

1. BEST SUMMARY

Basic idea. Each participant prepares a summary of the main points at the end of a presentation. Teams of participants switch their summaries and select the best summary from each set.

Application. This lecture game is especially useful for informational or conceptual content.

Sample topics. Introduction to online learning. Types of stories. Fuzzy logic. Conflict-management principles. Surface tension.

Flow. Stop the lecture at appropriate intervals. Ask participants to write a summary of the content presented so far. Organize participants into equal-sized teams. Redistribute summaries from one team to the next one. Ask each team to collaboratively identify the best summary among those given to them—and read it.

2. BINGO

Basic idea. Presenter hands out BINGO cards to participants. Presenter then delivers parts of a lecture interspersed with short-answer questions. Participants play BINGO by identifying the answers on their cards.

Application. This lecture game is especially useful when the instructional content is primarily factual or conceptual.

Sample topics. Basic computer terminology. Cultural norms in Asian countries. Introduction to symbolic logic. Investing in mutual funds. Management concepts from around the world. New employee orientation.

Flow. Divide the lecture outline into 10 to 15-minute sections. For each section,

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prepare a set of short-answer questions, and create BINGO cards with the answers. Present the first section of the lecture, then ask the first set of questions. If participants can find an answer on their BINGO card, they make a small checkmark in the square. Read the question and give the answer. Have participants shout "Bingo!" if they have any five-in-a-rows. Repeat the process of lecturing, having participants mark cards, and checking the cards, as needed.

3. BITES

Basic idea. The topic is presented in small chunks. Participants create questions for two experts to respond.

Application. This lecture game is especially useful for exploring controversial topics without getting bogged down in unnecessary debates. It requires two experts on the topic, preferably with divergent points of view.

Sample topics. Psychic phenomena. Knowledge management. Capital punishment. The future of computer technology. Political correctness.

Flow. Ask each team of participants to generate five questions on the topic and write each question on an index card. Spread the question cards on the experts' table. The first expert selects one of the question cards and gives the response while the second expert sorts through the question cards, sets aside trivial and duplicate questions, and selects another question card, all the while listening to the first expert's answer. When the first expert stops, the second expert adds brief comments and proceeds to another question. This process is repeated until all key questions are answered.

4. BRAINSTORM

Basic idea. Presenter conducts a brainstorming session on an open-ended question, contributing his or her ideas when appropriate. After brainstorming, presenter derives some general principles on the topic and corrects any misconceptions.

Application. This lecture game is especially useful when the instructional content is primarily informational or conceptual, or if the content involves analyzing and solving a problem.

Sample topics. Customer service. Gender differences in the workplace. Long-distance networking. Reducing waste in the workplace. Using a video camera.

Flow. Introduce the topic and inform participants that you will conduct a brainstorming session. If necessary, explain the ground rules for brainstorming. Start the brainstorming session, asking a question that is broad enough to elicit varied responses. Paraphrase participant responses and record them on a flip chart or projected transparency. When there is a lull in the responses, comment on the

items in the flip chart, challenging them or supporting them. Explain any discrepancies. At the end of the brainstorming session, correct any misconceptions and be sure to present opposing points of view. Summarize the major points.

5. CONCEPT ANALYSIS

Basic idea. Presenter asks a series of questions related to a concept. Building on participants' responses, presenter explores the critical features and types of the concept.

Application. This lecture game is especially useful for exploring concepts with which participants are familiar.

Sample topics. Facilitation. Empowerment. Innovation. Diversity. Leadership.

Flow. Begin by specifying the concept to be explored. Explain that the goal of the activity is to identify the critical features and types of the concept. Distribute a list of concept analysis questions. Ask participants to provide a variety of examples, ranging from clear-cut ones to border-line cases. Analyze the examples to tease out the critical features of the concept. Classify the examples into different types of the concept. Work with participants to discover the superordinate, coordinate, and subordinate concepts related to the main concept. Explore the synonyms, antonyms, and related words associated with the concept. With participants' input, create a comprehensive definition of the concept.

6. CROSSWORD LECTURE

Basic idea. Participants receive a crossword puzzle that contains questions to test the mastery of the major learning points in the presentation. During puzzle-solving interludes, participants pair up and solve as much of the puzzle as possible.

Application. This lecture game is suited for any type of content that can be summarized by a series of one-word-answer question (which are converted into crossword puzzle clues).

Sample topics. Digital photography. Customer service. Online marketing. High Definition Television.

Flow. Pair up participants and give a copy of a test disguised as a crossword puzzle to each pair. Begin your lecture and stop from time to time to provide puzzle-solving interludes. Before continuing the lecture, provide feedback and clarification based on participants' solutions.

7. DEBRIEF

Basic idea. A brief and powerful experiential activity is followed by a debriefing

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discussion to elicit and share useful insights.

Application. This lecture game is especially useful when the instructional content involves counter-intuitive principles, attitudes, and values.

Sample topics. Addictive behavior. Cultural Diversity. Everyday racism. Gender discrimination. Lateral thinking. One-way communication. Shifting paradigms.

Flow. Conduct your experiential activity without lengthy introduction. When the activity is finished, explain that different people may have had different insights from the activity. You will now conduct a six-step structured debriefing to help maximize learning. Start by asking participants how they feel. Then help them recollect the experiential activity. For the third step, encourage participants to generalize. State some general principles, and ask participants to provide evidence from the experiential activity, or from real life, to support or reject the principles. In the fourth step, help participants relate the activity to the real world. For the fifth step, ask speculative, what-if questions. Finally, for the sixth step, ask participants how they would behave differently if the activity were repeated. Help them generalize by asking them how they might change their real-world behavior.

8. DYADS AND TRIADS

Basic idea. Participants write closed and open questions and gain points by answering each others' questions.

Application. This interactive lecture is useful with any type of instructional content.

Sample topics. Interviewing customers. Doing business in France . Nutrition. Time management. Using the Internet. Chemical hazards.

Flow. The activity consists of three parts. During the first part, participants listen to a lecture, taking careful notes. During the second part, each participant writes a closed question on a card. During the next 7 minutes, participants repeatedly pair up and answer each other's questions, scoring one point for each correct answer. During the third part, each participant writes an open question. During the next 7 minutes, participants repeatedly organize them into triads. Two participants answer each question and the person who gave the better response earns a point.

9. EG-HUNT

Basic idea. Presenter uses examples to explain several related concepts. Later, participants generate examples to demonstrate their mastery.

Application. This lecture game is especially useful when the instructional content deals with a set of related concepts.

Sample topics. Architectural styles. Domains of learning. Personality types. Propaganda techniques.

Flow. Present the conceptual framework and explain the relationship among the concepts. Define each concept by identifying its critical and variable features. Illustrate with several examples. Ask participant teams to come up with a different example of the concept. Ask the teams to present their examples. Question the teams for clarification. Give appropriate feedback on each team's examples, highlighting the critical and variable features. Continue with your presentation, defining, explaining, and illustrating other concepts. Conclude by reviewing the concepts and relating them to each other.

10. ESSENCE

Basic idea. Participants write several summaries of a lecture, repeatedly reducing its length.

Application. This interactive lecture is particularly useful with factual, conceptual, or informational content that can be effectively summarized.

Sample topics. Technology breakthroughs. Collaborative problem solving. Computer graphics. Personality types. Descriptive writing. Online learning.

Flow. Ask participants to listen carefully to your presentation, taking notes. After the presentation, ask teams to prepare a 32-word summary of your lecture. Listen to the summaries from different teams and select the best one. Now ask teams to rewrite the summary in exactly 16 words, retaining the key ideas and borrowing thoughts and words from other teams' earlier summaries. Repeat the process, asking teams to successively reduce the length of the summary to eight, four, and two-words. Finally, ask each participant to write an individual summary of appropriate length.

11. FICTIONAL CASE STUDY

Basic idea. Presenter tells a story that illustrates different steps in a process. Teams of participants create and present their own stories.

Application. This lecture game is especially useful for exploring a procedure or a process.

Sample topics. Instructional system design. Creative problem solving. Stages in team development. Change management. Recovering from depression.

Flow. Distribute a diagram that identifies the steps of the process. Present your story, frequently referring to the diagram. Distribute a summary of the story, with notes that identify the different steps. Divide participants into teams of three to five members each. Ask each team to create a story to illustrate the process. Suggest

that the story could be based on a team member's experience, a historical event, or a popular TV show: After a suitable pause, randomly choose teams to present their stories. Comment on these stories and conclude with suitable caveats about the limitations of the process.

12. FISH BO WL

Basic idea. Presenter conducts a coaching session with an individual participant. Other participants observe and learn vicariously.

Application. This lecture game is especially useful when the instructional content involves procedures or principles.

Sample topics. How to design a form. How to design a frequency table. How to write an ad. How to construct a test.

Flow. Assemble a full set of practice materials and samples. Set up a table and a couple of chairs in the middle of the room. Invite participants to surround the table and watch the action. Distribute copies of handouts to all participants. Select a learner from the group. Explain that you will be coaching this learner and that you want the other participants to vicariously participate in the process. Begin the coaching session. Demonstrate the procedure. Invite the learner to ask questions. Require the learner to demonstrate what he or she has learned. From time to time, switch the learner with another participant and continue the procedure. At the end of the session, encourage participants to ask questions. Finish the session by giving an independent exercise.

13. GLOSSARY

Basic idea. The presenter identifies a key term related to the training topic. Teams of participants come up with a definition of the term. The presenter collects these definitions, inserts the correct definition among them, and plays a "dictionary"-type guessing game.

Application. The lecture game is particularly suitable for technical content with key concepts and definitions.

Sample topics. Microprocessor design. Java programming basics. Complexity and chaos. Principles of change management. The game of cricket.

Flow. Present a key term related to your training content and ask teams to come up with a real or imaginary definition. Collect the definitions, insert the "official" definition somewhere in this set, read these definitions, and challenge teams to identify the correct one. Use participants' definitions to identify training needs and make a suitable presentation. Repeat the process with several key terms until you have covered all relevant content.

14. IDEA MAP

Basic idea. While presenter lectures, participants take notes using an idea mapping approach. At logical junctures, the lecture stops to permit teams of participants to consolidate their idea maps.

Application. This lecture game is especially useful when the instructional content involves factual information or concepts.

Sample topics. The changing face of Eastern Europe . The chemistry of household cleaners. Fundamentals of financial planning. The future of mobile computing.

Flow. Teach the idea-mapping technique to participants. Introduce the topic and make a presentation for 10 minutes. Ask participants to take notes in an idea-mapped format. Stop your presentation and organize participants into teams. Ask each team to spend 5 minutes to collaboratively draw an idea map of the topics covered so far. Continue your presentation and repeat the idea-mapping interludes. At the end of the presentation, ask the teams to complete their maps and display them. Comment on the idea maps and correct any misconceptions.

15. INTELLIGENT INTERLUDES

Basic idea. The presenter requires participants to different types of intelligence to process the content presented in the lectures.

Application. This lecture game works effectively with any type of content. The presenter should be familiar with Howard Gardner's seven types of intelligence.

Sample topics. Working with the Swiss. Writing a mission statement. Personal marketing. Business writing. Leadership skills.

Flow. Divide the content into seven topics. Make a presentation about the first topic. Ask participants to write a summary of the main ideas, using their linguistic intelligence. After the second presentation, ask participants to use their logical intelligence to identify the most important idea. After the third presentation, ask participants to use their visual intelligence and draw a diagram related to the topic. After the fourth presentation, ask participants to use their musical intelligence and sing a song related to the topic. Repeat the process with similar interludes after each of the remaining topics.

16. INTELLIGENT INTERRUPTIONS

Basic idea. Presenter stops the lecture at random intervals and selects a participant. This participant asks a question, makes a comment, or challenges a statement as a way of demonstrating that he or she has been intelligently processing the presentation.

Application. This lecture game is especially useful when the instructional content is informational.

Sample topics. Business partnership in Canada . How to watch a soccer game. Retirement planning. The World Wide Web.

Flow. Set a timer for a random period between 5 and 10 minutes. Make the presentation in your usual style. Stop the presentation when the timer goes off. Announce a 30-second preparation time during which participants review their notes. Select a participant at random. Ask participant to demonstrate his or her understanding of the topic by asking five or more questions, coming up with real or imaginary application examples, presenting a personal action plan, or summarizing the key points. The selected participant should spend at least 30 seconds and not more than 1 minute in his or her "interruption." React to participant's interruption and continue with your presentation. Repeat the procedure as needed.

17. INTERACTIVE STORY

Basic idea. Presenter narrates a case incident in the form of a story. During pauses at critical junctures, participants figure out what happened, why it happened, or what should happen next.

Application. This lecture game is especially useful when the instructional content requires the analysis of a situation, identification of the basic cause, or selection of the best solution.

Sample topics. Likely impact of different managerial behaviors. Major causes of different performance problems. The next steps to be taken in different sales scenarios. Appropriate diagnoses for different computer problems.

Flow. Create a set of stories that require systematic analysis. Narrate the first story. Supply excess details so that the listeners have to separate critical information from irrelevant data. Stop the story at a critical juncture and specify the task for teams of participants. (For example, ask the teams to identify the causes of a problem.) Halfway through the discussion period, announce that you will answer two questions from each team. Ask each team to report its conclusion and to justify it. Repeat the procedure using more stories. Finally, summarize the main instructional points.

18. INTERPRETED LECTURE

Basic idea. The presenter pauses from time to time during the lecture. A randomly selected participant "translates" the lecture into plain English.

Application. This lecture game is particularly useful with complex topics. It requires a high level of language skills among participants.

Sample topics. Quantum mechanics. Managing software projects. The concept of flow . Investment banking.

Flow. Warn participants that you will randomly select people from time to time to interpret what you said during the most recent segment of your presentation. Lecture for about 5 minutes. Pause briefly to permit everyone to get ready for the interpretation segment. Randomly select a participant to repeat what you said in her language. After this interpretation, ask others to add any missing items. Repeat the procedure in approximately 5 minute intervals.

19. ITEM LIST

Basic idea. Participants review a list of items in a handout and select a few that need detailed explanation. Presenter clarifies these items.

Application. This lecture game is especially useful when the instructional content can be organized into a list of items.

Sample topics. Basic principles of message design. Gender differences in communication styles. Negotiation principles. Guidelines for conducting a workshop. WWW trends.

Flow. Give a short introduction to the instructional topic. Distribute copies of a handout that lists key items for discussion. Ask participants to review to the handout and select a few items for clarification. Ask participants to pair up with a partner and jointly select an item for immediate clarification. Select a participant at random and clarify the chosen item. After completing the clarification sessions, ask participants to choose items they would like to challenge and debate with you. Conclude with a review of the items.

20. JOB AID

Basic idea. Presenter steps through the use of a job aid. Participants form teams and use the job aid to work on an application exercise. Participants then work individually to master the use of the job aid on another application exercise.

Application. This lecture game is especially useful when the content involves a procedure and a job aid.

Sample topics. A worksheet for computing the price of a new product. A chart of copyediting symbols. A flowchart for selecting the best instructional method for a particular topic. An annotated diagram for troubleshooting a computer.

Flow. Distribute the job aid and give an overview of its features and use. Present an application exercise. Walk through the proper use of the job aid, eliciting as many suggestions from participants as possible. Comment on any unused job aid items.

Divide participants into teams and have teams work on a new application exercise. Provide assistance as needed. When teams have finished the application, have participants work on a new application exercise individually. Follow up by asking for participant questions, to which you provide answers and clarifications.

21. MULTILEVEL COACHING

Basic idea. Presenter “lectures” to a small group of participants and tests them to make sure that they have acquired the skill. These participants become coaches and train the others.

Application. This lecture game is especially useful with motor skills and foreign language acquisition where demonstration, coaching, and feedback are critical factors. It is best interspersed among other regular activities since it primarily involves one-on-one coaching.

Sample topics. Conversational phrases in Swahili. Magic tricks. Origami. Using a digital camera. Heimlich Maneuver.

Flow. Demonstrate the skills to four or six participants. Test to make sure that they have mastered the skill and certify them. Divide the certified participants into two teams. Ask the team members to individually recruit and train other participants. Each newly trained participant should be tested and certified by a member of the *other* team. After certification, participant becomes a member of the team that taught him or her. This participant now recruits others and trains them. The process is continued (over several days, if necessary) until everyone has been trained. At this time, whichever team has the most certified members is the “winning” team.

22. ONE, TWO, FOUR

Basic idea. Participants recall successful strategies that they have used (or heard about from others) for solving problems in a specific area. They share these strategies with a partner and later with a group of four people.

Application. This lecture game is especially useful when participants have practical experience in solving problems in a specific area.

Sample topics. Meeting management. Overseas assignments. Selling professional services. Time management. Firing marginal employees.

Flow. Before the session, come up with 4-6 subtopics related to the session topic. (Example from the topic of meeting management: disruptive participants, assigning action items, agenda, and time crunch.) Announce the first subtopic. Ask each participant to independently recall successful strategies that they have employed or heard about. After a pause, ask each participant to find a partner and share these strategies. When this task is completed, ask each pair to team up with another pair

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and share the strategies again, this time with each person reporting on his or her partner's strategies. Roam among participants, eavesdropping on the conversations. Assemble the entire group, and invite participants to present any impressive strategy that they heard during the earlier conversations. Give a brief report on effective strategies that you have used and heard about. Repeat the procedure with each of the other subtopics.

23. PRESS CONFERENCE

Basic idea. Participants organize themselves into teams and write a set of questions on different subtopics. Presenter responds to the questions in a press-conference format.

Application. This lecture game is especially useful when the instructional content is primarily factual or informational.

Sample topics. Marketing in the Pacific Rim . New-hire orientation. Features and functions of new products. Promotion policies.

Flow. Present a short overview of the major topic and identify three or four subtopics. Distribute index cards to participants and ask them to write at least one question on each subtopic. Collect the question cards and divide participant into as many teams as there are subtopics. Give each team the set of questions dealing with a specific subtopic. Ask the team members to organize the questions in a logical order, eliminating any duplicates. After a suitable pause, play the role of an expert and invite one of the teams to grill you for 10 minutes. At the end of this press conference, ask members of each team to review their notes and identify what they consider to be the two most important pieces of information given in your answers. Repeat this activity with the other teams.

24. QUESTION CARDS

Basic idea. After your presentation, ask teams of participants to write 20 short-answer questions based on the content. Collect all questions, shuffle the cards, and conduct a quiz program.

Application. This interactive lecture format is especially useful with factual content. It is suited for participants who are capable of constructing valid short-answer questions. The quiz program part of this activity requires ample time.

Sample topics. The Hispanic culture. Product features and benefits. Drug dosage, interactions, and abuse. Background information about the corporation.

Flow. Make your presentation and stop at 10-minute intervals. Ask teams of participants to write a set of short-answer questions along with answers on individual index cards. Continue with the next part of the presentation. After the last

part of the presentation, collect all question cards and shuffle them. Ask each team to send a representative to the front of the room. Conduct a question program using the questions from the cards (avoiding duplicate questions).

25. QUESTIONNAIRE ANALYSIS

Basic idea. Participants respond to a questionnaire and compute their scores. Presenter helps them to interpret the scores and learn more about the topic.

Application. This lecture game is especially useful when the instructional content involves values, attitudes, personality characteristics, or preferences that can be explored through a questionnaire.

Sample topics. Career planning. Troubleshooting styles. Decisionmaking styles. Equipment preference. Organizational climate.

Flow. Briefly explain the topics covered in the questionnaire. Distribute copies of the questionnaire and ask participants to independently fill it out. When all participants complete their task, distribute the scoring key. Ask participants to score their own questionnaires. Distribute copies of a handout that explains how to interpret the scores. Walk participants through the interpretation of different response patterns. Discuss how participants can use the new information in improving their professional effectiveness.

26. RAPID REFLECTION

Basic idea. Presenter pauses at different junctures during the presentation. Participants reflect on the latest segment of the presentation and write down one insight or application idea. A few random reflections are shared with the entire group.

Application. This interactive lecture format is especially useful with content that generates insights and application ideas.

Sample topics. Changing your job into a calling. Professional growth and development. Empowerment. Double-loop learning.

Flow. Stop your presentation at the end of each 7 – 10 minute segment. Ask each person to reflect on what they heard during the most recent segment of the presentation. After a pause, ask each participant to write down one insight or application idea on a piece of paper and fold it so the writing is hidden. Ask participants to exchange the folded pieces of paper repeatedly. Randomly select three or four participants and ask them to read what is written on the piece of paper they received.

27. SELECTED QUESTIONS

Basic idea. A list of questions (generated before the presentation) is reviewed, organized, and prioritized by audience members. You begin your presentation by answering the question selected by most participants. You repeat the process by responding to "popular" questions that are successively selected by the listeners.

Application. This interactive lecture format is especially useful when your audience members represent different areas of interest and levels of knowledge. It is suited for presentations that involve a broad survey of a topical area. The format requires a willingness on your part to let go of the control of the session.

Sample topics. Introduction to complexity theory. Future trends in global marketing. Characteristics of Hispanic culture. Internet commerce.

Flow. Prior to the presentation, invite participants to send you questions. Prepare a list of these questions, each identified by a number. At the beginning of the presentation, distribute the list of questions to each participant. Ask participants to individually select the question they would like to be answered first. At a signal, ask participants to shout out the identifying number of the selected question. Determine the most "popular" first question and respond to it. Ask participants to identify the next question to be answered using a similar procedure. Repeat as many times as time permits.

28. SHOUTING MATCH

Basic idea. Participants organize themselves into three teams and assume positive, negative, and neutral roles toward a controversial issue. Presenter conducts an informal debate among the teams and adds her own comments.

Application. This lecture game is especially useful with potentially controversial instructional content.

Sample topics. Affirmative action. Gun control. Health insurance. Political correctness. Sexual harassment policies.

Flow. Make an objective presentation to introduce the issue and identify its major elements. Write the issue on a flipchart in the form of a proposition for debate. Form three teams and assign an extremely positive role to one, an extremely negative role to another, and a neutral role to the third. Ask the positive and negative teams to spend 5 minutes making a list of arguments in support of their position. During the same period, ask the neutral team to prepare a 2-column list of both positive and negative arguments. Conduct a debate between the opposing teams. Ask the neutral team to decide which of the other teams did a more credible job. Also ask members of the neutral team to read arguments on their list that both teams missed. Add your comments and correct any major misconceptions by presenting factual information. Conclude with a question-and-answer session.

29. SLIDE SETS

Basic idea. The presenter distributes copies of key diagrams used during the presentation, a different diagram to each team. After a suitable pause, each team sends a representative to make a summary presentation of the major points related to the diagram it received.

Application. This interactive lecture format is especially suited for technical content that uses several diagrams during the presentation.

Sample topics. Changes in the change process. Decision-making in ambiguous situations. Product-design cycle. Installing and implementing a customer-response software system.

Flow. Make your presentation around presentation around 4 – 6 key charts or diagrams. After the presentation, divide participants into as many groups as there are diagrams. Randomly distribute a different diagram to each group. Tell the group that they will have 7 minutes to prepare a 1-minute presentation to summarize the key points related to the diagram. After a suitable pause, ask the teams (in the correct sequence) to send a representative to display the diagram and make the summary presentation.

30. SUPERLATIVES

Basic idea. Interrupt your presentation at the end of each logical unit and ask teams to identify the most important, the most disturbing, the most surprising, or the most complex idea presented so far.

Application. This interactive lecture format is especially suitable when participants know how to take notes and discuss them. It is appropriate for presentations that can be divided into 7 – 10 minute sections.

Sample topics. How to improve security in office buildings. Different types of performance interventions. Tips for avoiding heart attacks. Leadership strategies.

Flow. Stop your presentation at some logical location after about 7 minutes. Ask participants to work in teams to identify the most *important* piece of information you presented so far. After a suitable pause, ask each team to share its decision. Now ask teams to select the most *controversial* statement that you made in your presentation. After team responses, make the next unit of presentation. Repeat the teamwork procedure by specifying different types of information to be identified (such as the most radical, the most surprising, the most interesting, or the most humorous).

31. TABLE TALK

Basic idea. Presenter introduces two contrasting approaches. Participants collect information about the similarities and differences between these two approaches. Presenter organizes, summarizes, and clarifies the information.

Application. This lecture game is especially useful for comparing two alternative approaches. Usually one approach is traditional and the other is a new alternative that you are recommending.

Sample topics. Inclusive vs. exclusive behaviors. Leaders vs. managers. Virtual teams vs. face-to-face teams. Analytical intelligence vs. practical intelligence. Instructional technology vs. performance technology.

Flow. Before the presentation, prepare a table that identifies the two approaches and the critical comparison factors. Prepare questions related to each cell in the table. Begin the presentation with a definition of the two approaches. Randomly distribute question cards to all participants. Ask participants to come up with personal responses to the questions and to collect information and opinions from the others. After a suitable pause, distribute blank copies of the comparison table to all participants. Work through each cell in the table, eliciting information from participants. Correct any misconceptions and add additional information as needed.

32. TALK SHOW

Basic idea. Presenter acts as a talk-show host and interviews a panel of experts. Participants contribute additional questions and comments.

Application. This lecture game is especially useful when the instructional content is somewhat controversial.

Sample topics. New corporate policies. Sexual harassment. Rightsizing. Reengineering the organization.

Flow. Assemble a panel of experts, experienced people, or employees affected by the topic. Work out a list of major points to be covered in the presentation. Conduct a simulated talk show. Begin by introducing the topic and interviewing the panel members. Move into the audience of participants and invite them to make comments or ask questions. Encourage a free and open dialogue among participants and the panelists. Conclude the session by summarizing major points.

33. TEAM QUIZ

Basic idea. Presenter does a "data dump" of factual information. Presenter stops the lecture at intervals, allowing teams of participants to come up with questions on the materials covered so far and to conduct a short quiz contest.

Application. This lecture game is especially useful for presenting significant

amounts of technical information or conceptual content.

Sample topics. Principles of quantum physics. Compiler construction. The Linux operating system. ISO 9000 standards. Quality award criteria.

Flow. Warn participants that your presentation will be interspersed with quiz contests. Set up a timer for 10 minutes. Make the first segment of your presentation. Stop the presentation when the timer goes off. Organize participants into teams of three to seven members. Ask each team to come up with three or four fact-recall, rote-memory questions and one or two open-ended, divergent questions. After 3 minutes, ask a team to read a fact-recall question and choose an individual from any other team to come up with the answer. Later, choose another team to ask a divergent question and ask a team to give a response. Continue with the next segment of your presentation, building up on the questions and answers from participants. Repeat the quiz sessions as many times as needed.

34. TEAMWORK

Basic idea. Participants are divided into two or more groups. Each group listens to a lecture (and watches a demonstration) about a different part of a procedure. Participants then form teams with one member of each group. Team members work on an application exercise and help each other master all the steps in the procedure.

Application. This lecture game is especially useful when the instructional content involves a step-by-step procedure.

Sample topics. How to construct a Pareto chart. How to create an advertising slogan. How to draw a flowchart. How to specify a performance objective. How to write an executive summary.

Flow. Before the presentation, divide the procedure into steps. Begin the presentation with a brief overview of the steps and their interrelationships. Divide participants evenly into groups, one for each step. Make a separate presentation to each group. Create teams with one member of each group. Give the teams an application exercise. In completing the exercise, team members should teach each other the steps of the procedure. Provide consultative help and give additional exercises as needed.

35. TRUE OR FALSE

Basic idea. Presenter displays a series of statements about the topic and asks participants to decide whether each is true or false. Presenter then provides background information related to each statement.

Application. This lecture game is especially useful when participants are likely to have major misconceptions about the topic.

Sample topics. Cultural diversity. The Communications Decency Act. The Internet. AIDS and sexually transmitted diseases.

Flow. Prepare a list of statements related to common misconceptions about the selected topic. Make half of the statements true and the other half false. Briefly introduce the topic and explain its importance. Distribute copies of the list to participants and ask them to individually decide if each statement is true or false. When they have finished this task, read the first statement aloud. Ask participants who think that the first statement is true to raise their hands. Explain why the statement is true or false and provide relevant background information. Repeat the procedure with each statement.

36. TWO MINDS

Basic idea. Teams of participants prepare a list of questions about a topic. Two experts give independent responses to each question. After listening to both responses to a question, teams identify key similarities and differences.

Application. This lecture game is especially useful for exploring controversial topics without getting bogged down in unnecessary debates. It requires two experts on the topic, preferably with divergent points of view.

Sample topics. Psychic phenomena. Knowledge management. Capital punishment. The future of computer **technology**. **Political correctness**.

Flow. Ask each team of participants to generate five questions on the topic and write each question on an index card. Spread the question cards on the experts' table. The first expert selects one of the question cards and gives the response while the second expert listens to music through headphones. After the first expert's response, the second expert gives her response. Each participant team now compares their notes and identifies two similarities and two differences between the responses from the two experts. The two experts now sort through the question cards and select the top 5 questions. The second expert begins the next round by responding to a question while the first expert puts on the headphones. The same procedure is repeated for the remainder of the session.

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URL: <http://www.thiagi.com/interactive-lectures.html>

Revised: June 18, 2003

(Thiegi, 2002)

99 Seconds: A Packet of Jobs Aids

What is it?

99 Seconds is a special type of panel session that features 10 or more presenters. Each presenter makes a brisk, self-contained presentation that lasts for less than 99 seconds. Although all presentations deal with the same general topic, no attempt is made to sequence them in any logical order or to standardize the presentation format.

Why do it?

Here are some advantages of the 99-Seconds strategy:

Efficiency. The tight time limit forces presenters to focus on the key learning points and to avoid dwelling on trivial “nice-to-know” points.

Interest. The unusual format and rapid change of presenters maintains high levels of audience interest, especially with the new generation of learners brought on MTV programs.

Variety. Presenters talk about different points using different formats. This variety enables audience members to receive a well-rounded picture of what is happening.

Participation. Audience members have to actively organize different presentations into a coherent whole that makes sense to them. After the session, they may have to do some research to close any gaps. These responsibilities give additional ownership to the listeners.

Assessment. The 99-second format can be used as a performance test for presentation skills.

How To Present a 99-Seconds Session

- At the beginning of the session, sit in front of the room, in your assigned seat.
- Observe your predecessor when he or she leaves the seat to become the timekeeper.
- When your predecessor returns to her seat after the presentation, you move to the *presenter's* location. Make your presentation.
- Keep an eye on the count-down timer. Remember you will be forcibly evicted if you exceed the 99-seconds limit.

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- When you complete your presentation, accept the applause and return to your original seat. Listen to the other presenters.

Mores Suggestions for Presenters

- Choose a single concept, principle, or tip.
- Choose a topic that you can explain to someone in a minute's time. This leaves you some extra time for additional embellishments.
- Practice your presentation with a timer. It's difficult to estimate the passage of 99 seconds. It is a longer period of time than you think. But if you are a long-winded person, the 99 seconds appear to shrink.
- Don't memorize your presentation. But be sure that you can recall the key ideas in the correct sequence.
- Practice your presentation with an audience of one or two friends. Revise your presentation based on the feedback.
- You don't have time to use elaborate media. Use your imagination to create memorable props.
- If necessary, you may use a couple of PowerPoint slides. Make sure that each slide has fewer than 6 lines and each line has fewer than 6 words.

What Are Different Types of 99-Second Presentations?

There are many different types of 99-second sessions. For our convenience, we have grouped 35 different formats into four categories in the discussion below.

Active Participation

This type of 99-second session involves interactive strategies. A major problem with active participation is the time consumed by getting audience members organized and interacting. Here are two possible solutions: You can ask independent participation by individuals. Alternately, you can bring a small group of people on stage to demonstrate the interaction. If you choose the second approach, be sure to rehearse the session with your demonstration group to get the timing right.

Creative visualization. Facilitator asks participants to close their eyes and takes them through a guided visualization exercise to encourage creative problem solving or empathic understanding. Example: Everyday life in a refugee camp.

Introspection. Facilitator asks a series of questions that provoke participants to arrive at some truthful insights. Example: How would your career be affected if your sexual orientation were different?

Physical Activity. Performer demonstrates a physical activity, inviting audience members to follow along. Example: How to relax by using yogic breathing technique.

Data Collection. Presenter asks all audience members to write down one or two words in response to an open-ended question. She then shares the results from a previous group. (The new data are analyzed later and the results are posted on a web site.) Example: What's the most important benefit of e-learning?

Debriefing. Facilitator asks audience members to focus on a common experience and conducts a debrief by asking a series of targeted questions and sharing a typical response for each question. Example: Encounters with irate customers.

Each Teach. Facilitator asks one half of the audience to close their eyes and cover their ears and explains how to apply the first step of a two-step procedure. She then asks the other half to close their eyes and cover their ears while explaining the second half. Audience members are encouraged to partner with one another and practice the entire skill after the session. Example: How to say "hello" and "good-bye" in Malayalam.

Jolt. A brief experiential activity that provides a powerful epiphany. Example: An exercise in which two participants arm wrestle, ignoring the rules that actually support a cooperative approach ("Your score depends on how many times your hand touches the table")

Poll. Presenter conducts a quick poll – and reveals the data by asking audience members to raise their hands or stand up. Examples: How many of you had meetings with SMEs that were (a) positive, (b) neutral, or (c) negative?

Questions and Answers. Prior to the session, presenter distributes questions to confederates in the audience. During the presentation she "invites" questions from the audience and responds to them. Example: Legal aspects of sexual harassment.

Silence. Presenter observes a minute of silence to encourage a review of earlier ideas.

Sing-Along. Presenter invites audience members to sing along with her, using a well-known tune and words from a handout.

Brief Presentations

This type involves effective presentation techniques that are usually incorporated as parts of lengthier presentations.

Analogy. Presenter suggests an analogy (by holding up a prop or displaying a graphic) and describes how it is similar to a real-world object or process. Example: Bullying as an analogy to sexual harassment.

Cartoon. Presenter displays a cartoon (or a comic strip) on screen and explains a powerful principle illustrated by it. Example: Dilbert illustrating the uselessness of consultants.

Formula. Presenter displays a formula and quickly explains the variables and functions. Example: How to compute your daily rate for consulting services.

Joke. Presenter tells a joke with a punch line that reveals an important truth. Example: A small child exclaiming that the emperor has no clothes.

Magic Trick. Performer does a conjuring act and uses it as an analogy for an important principle. Example: Linking Rings magic trick to illustrate the power of belief.

Pithy Saying. Presenter displays an aphorism or a proverb and explains its application to the topic. Example: Discussion of the impact of the German proverb on teambuilding strategies: Durch zusammenleben, lernt man zusammenleben. (By living together, people learn to live together.)

Poetry Reading. Presenter recites a poem that highlights critical principles. Example: A ballad about office romances to illustrate performance problems.

Rap Song. Resenter performs a rap song that highlights critical principles. Example: New-hire orientation.

Story Telling. Presenter tells a personal anecdote or a short-short story that highlights an important principle. Example: Frederic Brown's Sentinel in which the admiral soldier-hero turns out to be an alien invading Earth!

Mediated Presentations

We can incorporate different types of media productions in a 99-seconds presentation. An important precaution is to test out the equipment ahead of time and to have a back-up.

Audio Recording. Presenter plays an audio recording in the form of a new item to highlight key principles. Example: "Scientists report a simple technique to prevent repetitive stress injuries in the workplace..."

Conversation with alter ego. Performer plays dual role by having a conversation with her "evil twin sister" presented through an audio or video tape recording. (This recording

is produced ahead of time with suitable pauses to permit a simulated conversation.)
Example: A debate about the advantages and disadvantages of teamwork.

Movie Excerpt. Presenter uses an excerpt from some popular movie to highlight important principles. Example: A 1-minute excerpt from the movie Gettysburg to show visionary leadership in action.

Music. Presenter performs or plays the recording of a piece of music and quickly highlights the critical message. Example: John Lennon's Imagine followed by an exhortation for performance technologists to work on world peace.

Puppets. Performer conducts a conversation with a puppet to highlight important principles. Example: Importance of environmental protection.

Puzzle. Presenter displays a puzzle on screen and asks participants to solve it to identify a critical principle. The puzzle is gradually solved to speed up the process. Example: A "Wheel of Fortune" puzzle with a statement about rewards and reinforcement.

Silent Slide Set. Presenter displays a set of slides (in an animated form) that explain a process. Example: Five steps in rapid instructional design.

Video Recording. Presenter plays a videotape recording to highlight some important points. Example: Videotape recording of a typical office room to identify different safety hazards.

Co-Presentations

More than one person can present a 99-second session. The key element in this approach is for the co-presenters to rehearse the presentation and to time it tightly.

Conversation. Two presenters discuss a common paradoxical topic, highlighting the pros and cons of the extremes. Audience members realize that the paradox has to be managed effectively to reduce the disadvantaged and to utilize the advantages. Example: "Individuals cannot produce significant results" vs "Teamwork results in waster effort".

Drama. A small group of people (in suitable costume, if possible) act out a skit that highlights key elements of an effective procedure, usually be presenting before-and-after segments. Example: How to conduct a rapid performance analysis.

Gibberish. In this improve-theater an alien or a guru is interviewed by an expert. The alien talks in gibberish and the expert translates what she says. Example: What a Klingon has observed about human behavior during staff meetings.

One Word At A Time. In this improve technique, three or more participants respond to questions from the audience members or present and important message, taking turns to speak one word at a time. Example: The importance of equal participation.

Role-play. Two presenters (or the presenter and a “volunteer” from the audience) conduct a role-play that illustrates some important interpersonal skill. Example: How to present bad news to the client.

What Does the Audience Want?

Based on interviews of hundreds of audience members from previous 99-seconds sessions, here are five important guidelines:

- Balance learning with entertainment. Deliver powerful learning content, but don't bore people. Use attention-getting devices but avoid 99 seconds of fluff.
- Keep your session self-contained. Make sure that participants receive immediate value in these 99 seconds. Don't use the session to sell your other sessions or publications. Don't even mention them.
- Be realistic about what you can present within 99 seconds. Rehearse your session so you can deliver it in 90 seconds without talking fast and running out of breath.
- Think auditory. Think in terms of story telling and radio. Don't distract audience attention with too many slide or crowded handouts.
- Use interaction, but don't waste time with elaborative instructions. Focus on cognitive interaction rather than physical interaction.

Introducing the R2D2 Model: Online learning for the diverse learners of this world

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The R2D2 method—read, reflect, display, and do—is a new model for designing and delivering distance education, and in particular, online learning. Such a model is especially important to address the diverse preferences of online learners of varied generations and varied Internet familiarity. Four quadrants can be utilized separately or as part of a problem-solving process: the first component primarily relates to methods to help learners acquire knowledge through online readings, virtual explorations, and listening to online lectures and podcasts. As such, it addresses verbal and auditory learners. The second component of the model focuses on reflective activities such as online blogs, reflective writing tasks, self-check examinations, and electronic portfolios. In the third quadrant, visual representations of the content are highlighted with techniques such as virtual tours, timelines, animations, and concept maps. Fourth, the model emphasizes what learners can do with the content in hands-on activities including simulations, scenarios, and real-time cases. In effect, the R2D2 model is one means to organize and make sense of the diverse array of instructional possibilities currently available in distance education. It provides new ways of learning for diverse online students, and demonstrates easy-to-apply learning activities for instructors to integrate various technologies in online learning. When thoughtfully designed, content delivered from this perspective should be more enriching for learners. The R2D2 model provides a framework for more engaging, dynamic, and responsive teaching and learning in online environments.

Introducing the R2D2 Model

Online Learning for the Diverse Learners of this World

Online learning has been increasingly popular in training and education. In 2004, about 2.7 million students in the USA took at least one course online, and 91% of

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the public learning institutions in the USA had online class offerings (Allen & Seaman, 2004). However, with a high drop out rate (Carr, 2000; Diaz, 2002; Frankola, 2001), instructors face serious challenges to attract and retain diverse learners in online courses. Learners in online environments, especially those born after the mid-1970s, want learning that is responsive to their preferred styles of learning. Thus, it is important to recognize the rich body of literature on learning styles within face-to-face instruction (e.g., Felder & Brent, 2005; Kolb, 1984; Lawrence, 1993), and to provide an extended theoretical framework as well as practical guidance to enable online teaching to address varied learning styles, cultural backgrounds, generational differences, and preferences. This article proposes an easy-to-apply, practical model—the R2D2 model—that is designed to help online instructors integrate various learning activities with appropriate technologies for effective online learning. In this way, R2D2 provides a framework for the changes required in learning and teaching that will arise as online distance education becomes more and more widespread.

Learning Styles

According to Kolb (1984), effective learning involves four phases: (a) getting involved in concrete experiences; (b) reflective listening and observations; (c) creating an idea with an abstract conceptualization; and (d) making decisions through active experimentations. Extending Kolb's experiential learning approach, Bernice McCarthy (1987) developed the 4MAT system, identifying four types of learners: innovative, analytic, common sense, and dynamic. According to McCarthy, innovate learners are primarily interested in personal meanings, whereas analytic learners are focused on acquiring facts to understand concepts and processes. In contrast, common-sense learners want to know how things work, while the fourth type of learner in her model—dynamic learners—are primarily interested in self-directed discovery.

Similarly, Fleming and Mills (1992a, 1992b) identified four types of learners and learning styles: (a) visual; (b) auditory; (c) reading/writing; and (d) kinesthetic, tactile, or exploratory, known as the VARK learning styles. According to the Fleming and Mills model, visual learners prefer diagrams, flowcharts, and graphics, yet educational technologies such as videos, films, Webcasts, or PowerPoint presentations are noticeably absent from their descriptions. In addition, auditory learners prefer hearing directions, lectures, or verbal information. Learners who prefer reading and writing learn best from text passages, words, and written explanations. Finally, tactile or kinesthetic learners learn best by connecting to reality through hands-on examples, role plays, debates, practice exercises, and simulations.

All types of learning situations and events have their benefits and opportunities. The options available in online environments can make the learning formats more explicit. At the same time, the wealth of options might overwhelm online instructors and course designers. To provide an organizing aid for the various options, we designed a model for addressing online learning styles and an associated mnemonic to enhance the memorability and use of it.

Recent research by Bonk, Kim, and Zeng (2006) indicates that there is a shift looming on the horizon to more active learning, problem-solving, authentic learning, and virtual teaming or collaboration online. Bonk et al.'s research within both higher education and corporate training environments indicates that online courses will move away from being text-centered and lecture-based while increasingly incorporating hands-on activities (Kim, Bonk, & Zeng, 2005). While hands-on learning was deemed the least addressed area today, it was predicted to be the most salient aspect of e-learning courses in the next couple of years (Bonk et al., 2006). Of course, more complex and realistic simulations, scenarios, and interactive news stories are already signaling part of this trend.

This shift may reflect not only technological advances, but also may mesh with the learning styles of younger generations that are surfacing in college classrooms and corporate training settings (Oblinger, 2003). With young, tech-savvy learners entering college classrooms, there is increasing attention on generational lifestyles; some of it focusing on how different generations of students learn, or not learn, with various emerging as well as more common technologies (Dede, 2005). With increasing numbers of Generations X and Y as well as younger learners in online courses, educators must consider how to design their courses for greater interactivity, visualization, collaboration, captivation, and technology sophistication to motivate learners and promote effective learning.

R2D2 Model

As a further extension of the above theoretical framework, we propose the R2D2 model for online learning. It is distinct from instructional design models with the same name (e.g., Jost, Mumma, & Willis, 1999) or similar names such as R2D5 (i.e., Dream, Define, Design, Develop, Deliver, Review, and Revise—Pederson, 2005). Our model does not specifically address the instructional design and development process; instead, it fosters reflection on the type of tasks, resources, and activities that one may want to embed in an online course or module so as to address different human learning strengths and preferences or skill target areas. Like 4MAT and VARK, the R2D2 model proposes an integration of four types of learning activities: (a) Reading/Listening; (b) Reflecting/Writing; (c) Displaying; and (d) Doing. While highly similar to the VARK method, the R2D2 method places more emphasis on reflective activities, while auditory activities are generally grouped with the reading and writing quadrant. As noted in Table 1, the R2D2 model suggests a variety of learning activities for active and effective online learning with various e-learning technologies for each type of learner.

Applications of the R2D2 Model

As indicated, there are four components to the R2D2 model—Reading, Reflecting, Displaying, and Doing. Below we detail each of these components as well as instructional activities that link to each area and type of learner. However, almost every

Table 1. Learning activities and technology applications for online course using the R2D2 model

R2D2	Learning activities	Technology/resource/example
Reading, listening, and knowledge acquisition For auditory and verbal, who prefer words, spoken or written explanations	Reading materials (online or offline) and finding information (online or offline)	Announcements, Q&A, FAQs
	Synchronous online presentation	Elluminate™, Live!™: http://www.illuminate.com/ Breeze™: http://www.macromedia.com/software/breeze/
	Online discussions, group discussions, and presentations	Chat, Instant Messenger, bulletin boards/forums, Yahoo groups, listservs
	Guest expert chats with text, audio, whiteboard, application share, video, etc.	Chat, Instant Messenger, bulletin boards, Yahoo groups, listservs
	Online tutorials	pubMed tutorial: http://www.nlm.nih.gov/bsd/pubmed_tutorial/m1001.html
	Webinars	Webinar: http://www.nten.org/webinars
	Listen to and/or watch lectures posted on the Web	Audio, streamed video, podcasts Podcast directory: http://www.podcast.net/ NPR podcast directory (Beta): http://www.npr.org/rss/podcast/podcast_directory.php Webcasts: United Nations Webcasts: http://www.un.org/webcast/index.asp UC Berkeley Webcasts: http://webcast.berkeley.edu/
	Listen to and/or watch expert explanations	Audio, streamed video, podcasts
	Online meetings in chat rooms or forums	Chat, Instant Messenger, bulletin board, Yahoo groups, listserv
	Online brainstorming or discussion with peers	
Online testing	Hot potato: http://web.uvic.ca/hrd/halfbaked/ Captivate: http://www.macromedia.com/software/robodemo/	
Webquest	Webquest portal: http://webquest.org/	
Online scavenger hunt	Online scavenger hunt: http://www.spa3.k12.sc.us/Scavenger.html	

Table 1. (Continued)

R2D2	Learning activities	Technology/resource/example
Reflection For reflective and observational learners, who prefer to reflect, observe, view, and watch learning; they make careful judgments and view things from different perspectives	Posted interviews about occupations, internships, and field placement observations	Blogs, bulletin board, streamed video
	Online role play	Threaded discussion forums, interactive video conferencing via Elluminate™, Breeze™, or the like
	Online debates, pros and cons, mock trials	Bulletin board, threaded discussion forums, online chats, video conferencing
	Collaborative group paper writing	Sharepoint, Groove, Word, etc.
	Annotate electronic texts	Blogs, Word documents with footnotes, comments, annotations
	Read, react to, and reflect upon documents in another language	Blogs, online newsletters
	Write reflection papers: team reflection papers, trends in field, chat with expert reflections, group or class blogging, summary papers, etc.	Online discussion forums, blogs, bulletin boards
	Provide feedback on papers	MS Word "track changes" and "comment"
	Conferences with live video feeds	Internet Time Group: http://www.internettime.com/visual/gallery6.htm
	Watch or observe expert performances online (music, Cyber fashion show, etc.)	Streamed video, video conferencing
Displaying	Online modeling with archived exemplary performance data	Streamed video Learning management systems (e.g., Moodle, WebCT, Blackboard, Desire2Learn, ANGEL, etc.)
	Electronic portfolios with reflections	E-portfolios, blogs, personal homepage or Web site, CD, DVD
	Search video library of concepts, cases, or experts	Video files, CD, DVD

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Table 1. (Continued)

R2D2	Learning activities	Technology/resource/example	
For visual learners, who prefer diagrams, flowcharts, timelines, pictures, films, and demonstrations	Learners generating graphic representation of knowledge structure	Concept mapping (e.g., Inspiration, Kidspiration) and other visualization software Visual Understanding Environment (VUE): http://vue.tccs.tufts.edu/ IHMC concept mapping tool: http://cmap.ihmc.us/	
	Learners create task timelines	Timeline tool: http://www.readwritethink.org/materials/timeline/ http://www.learningtools.arts.ubc.ca/timeline.htm http://www.teach-nology.com/web_tools/materials/timelines/ http://www.learningbydoing.net/	
	Interactive visual with online chat	Bulletin board, blogs	
	Peer evaluation and critics on learner-generated graphic representations	Instant Messenger with whiteboard	
	Use draw tools in asynchronous chats	Statistics, cash flow, visualization software to track weather patterns, etc.	
	Flash visuals and animations	Virtual tours http://astro.uchicago.edu/cara/vtour/ http://www.michielb.nl/sun/ http://www.md.huji.ac.il/vjt/	
	Taking virtual tours, and post team project in a gallery or virtual tour	ExplorersWeb: http://www.explorersweb.com/ The Poles: http://www.thepoles.com/	
	Adventure blogging	Video-streamed lectures	
	Doing For tactile/kinesthetic learners, who prefer learning by active doing, experiencing, hands-on, and often also group work	Online demonstrations	The Global Grocery Project: http://www.landmark-project.com/gg/ The Globe Program: http://www.globe.gov/globe_flash.html
		Interactive, project-based learning with dynamic online databases	
	Case simulations and manipulations	Business, special education, medical science, chemistry, etc.	

Table 1. (Continued)

R2D2	Learning activities	Technology/resource/example
	Case-based learning	MedCases CME Portal: http://www.medcases.com/Physician/cme_portal.asp SimTeacher: http://www.simteacher.com/
	Online simulations and lab resources	Simulated businesses, hospitals, schools, farms, planets, etc.
	Posting oral histories	Blogs, bulletin boards
	PBL	Final products in online gallery or Web site
	Online survey research	http://www.surveymshare.com and http://info.zoomerang.com
	Use iPod to create radio station	iPod, podcast
	Digital movie-making based on reflective writings	Digital video-recording hardware and software
	Create an online gallery to demonstrate current, past, and future students' learning outcomes and achievements	http://www.indiana.edu/~tickit/projectgallery/gallery.htm
	Online personal performances	Theater, music, and surgery Webcasts, podcasts, etc.

activity discussed below will address more than one component. Our classifications are meant to indicate which aspect is primarily being addressed. If instructional designers involved in distance learning initiatives as well as online instructors take these four types of learning and learning activities into account when designing and delivering online and other forms of distance learning courses, they should experience higher success rates with diverse students.

Reading, Listening, and Knowledge Acquisition for Verbal or Auditory Learners

Reading, exploring resources, and listening to online lectures is the first part of the R2D2 model. Given that one must typically acquire knowledge prior to knowledge use, this first quadrant of the model essentially focuses on knowledge acquisition.

In distance learning, there are various ways that knowledge can be acquired—through video-streamed lectures and podcasts, synchronous presentations, online discussions, guest expert chats, and online and paper-based readings and explorations. Learners in this quadrant might also prefer online tutorials, audiotapes or audio files, group discussions, speaking or presenting, and generally talking things through and negotiating meaning. With synchronous presentations and video-streamed presentations from the instructor or guest expert, the learner has multiple ways to internalize the information including both visual and verbal representations.

Podcasting, which typically involves only an audio-channel, is rapidly growing in use in both higher education and corporate training. Online knowledge acquisition may also happen in virtual classrooms or Web conferences, with application sharing, Web touring, surveys and polls, online presentations, and chats. As the formats of online presentation tools proliferate, it is vital to conduct research in this area. Podcasting, for instance, has many open research questions related to learner satisfaction, use, access, and overall learning.

In terms of reading, an online scavenger hunt and Webquest are common types of such activities. A learner might be assigned online reading materials or required to find articles that relate to the activities for a particular week. Content explorations might be guided where students read from a selection of articles prescreened by the instructor. Such guided discovery activities also might be more open-ended, where students select articles based on their interests related to the course. The latter approach is perhaps more suited to self-directed or self-motivated learners and online learning veterans; often these are older and more mature adults. In contrast, pre-assigned readings might be employed when students need more guidance or who are new to e-learning. Verbal learners will also appreciate frequently asked questions (FAQs), course announcements, and the archiving or posting of email internally within the system.

Such learners may also prefer online chats, especially with voice channels open. Chat tools can also be used for online quizzing of select students to test their understanding of course content, using dynamic assessment that changes with their answers. Finally, foreign language courses might have students read online newsletters, newspapers, magazines, and other foreign correspondence and then test them or have them use it in a particular way.

There are a variety of ways to help online learners read, listen, explore, and otherwise acquire knowledge. Instructor guidelines on how to use these tools and where to focus one's efforts are central to the smooth running of the course and student retention within it. In effect, the first quadrant of the R2D2 model lays out a range of learning activities to help with active knowledge acquisition and collaborative knowledge construction with widely available learning technologies.

Opportunities for Reflective or Observational Learners

The second part of the R2D2 model has students reflect on what they have learned; essentially, it addresses reflective or observational learners who prefer observing, viewing, watching, and reflecting upon learning situations and activities. Such a learning style relates to those who listen to others and learn from models or examples of what is expected. Naturally, as a key part of this reflection, this quadrant also emphasizes writing tasks and activities.

Distance learning may offer these types of learners engaging opportunities not available in face-to-face classes. With asynchronous discussion forums, for instance, they can think carefully and thoughtfully before responding to others or posting a new message. Such delayed response opportunities are especially important for

in-depth discussions and to critically synthesize thoughts across topics. Instructors may also ask students to create online resource libraries (ORLs) of additional articles that they have read.

While reading electronic articles and exploring associated resources is vital to learning, collaborative and reflective writing online has become an increasing part of the curriculum. For instance, in addition to everyday email responding, bulletin board commentaries on current news and posted articles, threaded online discussions in college courses, and engaging in multiple online chats with colleagues and friends around the world, millions of learners are now reflecting on their learning in their personal or course-related blogs. There are many instructional uses of blogs, such as individual blogs for reflections, team blogs for joint assignments, instructor blogs for a class, and class blogs for cross-cultural exchanges (Martindale & Wiley, 2005). In our own classes, we typically assign students a “critical friend” in the class who gives them weekly feedback and hopefully some encouragement on their blog-related postings. Also, at the end of the semester, we require a reflection paper on their overall blogging experiences and associated learning.

In addition, students might engage in mock trials, pro-and-con debates, and role plays within online discussion forums or conferences.¹ These controversies will foster critical reflections as well as collaborative knowledge sharing and construction. And, of course, reflection papers, summary writing, and collaborative group papers are also ideal for reflective learners. Once completed, learners will further benefit from written comments and annotations from peers, team-mates, and experts. As we have found, the “track changes” and “insert comment” features in Microsoft WordTM are handy.

There are a variety of other highly reflective activities which can be fostered on the Internet. For instance, in an internship or field placement in professional schools, such as accounting, law, education, or nursing, students may interview practitioners about their jobs so that they can reflect on the demands of a particular occupation. They may also reflect on how certain concepts, principles, or ideas from their book(s) or online lectures are referred to, encountered, or handled in the real world (Bonk, Hara, Dennen, Malikowski, & Supplee, 2000). During such live placements, reflective learners might notice particular nuances related to how a concept is implemented as well as alternatives and competing ideas to that which they have learned in class. As a result, they might discern where book knowledge is not directly applied in the real world as well as how their knowledge must continually be modified and updated to fit the actual circumstance or situation. If an internship is not possible, online instructors might embed videos of real-world situations and scenarios for learners to reflect on. Of course, while such a technique is useful for visual learners, it also has extensive applications for reflective learners depending on the task selected and overall pedagogical use.

Another way of placing reflective learners into professional situations, again with links to visual learning as well, is to have them attend video-streamed conferences, seminars, or live performances, such as online music recitals, theater performances, heart surgeries, and fashion shows (e.g., Carlson, 2004; Olsen, 2003; Young, 2003).

As Albert Bandura's (1986, 1997) social cognitive model of learning highlights, observation and reflection are highly powerful components of human learning. Fortunately, with the emergence of personal learning tools such as blogs, personal homepages, student profiles, and electronic portfolios, opportunities for students' reflections on their performances continue to mount. Using such tools as e-portfolios, learner reflections can be accumulated and shared (Young, 2002). Of course, when online learners transition from observational learning to conducting their own online performances, they tend to operate in the fourth quadrant of the R2D2 model, as described below.

Similarly, online learners might reflect on a podcast or Webinar offered via a virtual classroom using tools like Breeze™, WebEx™, Placeware™, or Elluminate™ (Erlanger, 2005). Instructors might, for instance, conduct a demonstration of a physics or chemistry experiment online that can be reused and synchronized with student notes. These activities apprentice students into their chosen profession by allowing them to lurk on the outside or periphery of a discipline, in effect, as legitimate peripheral participants (Lave & Wenger, 1991). If current trends continue, such synchronous e-learning tools and applications will offer increasingly interactive activities for apprenticing online learners and fostering learner engagement (Bonk et al., 2006; Shi & Morrow, 2006).

With trends toward more active and self-directed learning, there has been a parallel emphasis on student reflection so that they internalize and expand upon their learning pursuits. For instance, online instructors might utilize self-tests, self-reflections, "Did you know?" prompts, and other self-assessment activities to get learners to pause and reflect on the content that they are learning. Such tasks are especially common in courses with extensive learner-content interactions or minimal feedback from instructors, peers, and outside experts. Along these same lines, sample answers or archived student work examples give reflective learners something to observe as a standard or model of exemplary performance. Online modeling might be especially useful in physical education and outdoor recreation courses as well as in counseling, teacher training, and any form of emergency preparedness training.

As e-learning tools are designed for self-testing, reviewing one's performance, and observing the performance of others, there are increasing opportunities for those who prefer activities in the second quadrant of the R2D2 model. As clearly indicated by the R2D2 model, emerging and existing technologies provide new opportunities to address the varied learning styles and preferences in online courses, and, at the same time, these differences require more responsive online pedagogies. What seems needed now is research in this area to explore the impacts of reflection on student learning and course satisfaction.

Displaying Learning for Visual Learners

The third part of the R2D2 model forces students to represent what they have learned or are in the process of learning through visual representations, depictions, or overviews. Learning in this quadrant of distance education focuses on providing pictures, diagrams, charts, graphs, videos, animations, and written overviews or

summaries, and, therefore, relates most closely with visual learners. It can also involve the manipulation of mathematical and scientific symbols as in algebra, chemistry, and physics. There is notable overlap here with the reflection category, since activities in both quadrants can entail showing learners a macro representation of a concept, principle, or idea and then having them reflect on its use.

Once again, there are myriad strategies that can be called upon in distance learning environments to address visual learners or others who have moved to this stage of the R2D2 learning process. For instance, an online instructor might use an interactive whiteboard in synchronous communications with students using arrows and different colors, notations, and highlights. The instructor might also have students explore or search through an online library of video clips which display concepts, procedures, and skills as in the real world. In particular, video cases are often used in professional schools such as business, medicine, law, and education to display key concepts in action.

Another way to address this form of learning is through a series of visuals for exploration or navigation. For instance, the Internet is becoming increasingly used for virtual tours. An archeology professor might take students on a virtual tour of a Mayan ruin, an economics professor might design a virtual tour of oil wells and the underlying supply potential around the world, and a tourism instructor might show students how to highlight different points of interest in a country, community, or geographic region. Such virtual tours might provide quick overviews that anchor students' learning in a visual that can be discussed or replayed later to pull out key concepts (Cognition and Technology Group at Vanderbilt, 1990).

There are still more techniques to enhance student visual learning, such as adventure blogs and animations. Adventure blogs may provide current and interactive news stories, blogs of explorers in their travels, and videos of explorer treks or scientific experiments. Such tools take students directly to the content instead of reading about it in books or online articles. In effect, students can see it in action. While less current, online animations are also increasingly used to bring learners more directly into a discipline. An animation can be played to illustrate a concept more clearly, paused to give the learner time to reflect on it, and replayed when the learner has specific questions. As with the use of video cases and virtual tours, both adventure blogs and animations situate student learning in a real context (Brown, Collins, & Duguid, 1989; Collins, 1990; Collins, Brown, & Newman, 1990) and engage such students in authentic learning environments (Herrington & Oliver, 1997; Herrington, Oliver, & Reeves, 2003; Reeves, Herrington, & Oliver, 2002).

The visual displays that are now available online can draw students into the learning environment and help them connect concepts that they have read about (Quadrant 1 of R2D2) and reflected upon (Quadrant 2 of R2D2), and begin to internalize them through visual conceptualizations. Even more important is having students form their own visual depictions and representations of the content, since students are more likely to remember information when they actively construct their own knowledge (Cognition and Technology Group at Vanderbilt, 1991). For instance, students might create a concept map summarizing key points of a paper,

chapter, module, or lesson. Students might also represent their learning in a comparison and contrast matrix, Venn diagram, flowchart, or virtual tour. There are also a number of timeline tools available to help students represent their learning. With all these visual formats, one of the key goals is to foster student critical thinking and evaluation of their learning.

The Internet is a highly visual tool which provides learners and instructors with access to current events in ways that previously were not possible. While there are many such visualization technologies available and new ones are constantly emerging, additional tools and toolkits for visual representation are needed to guide learners to become more self-directed in their online learning pursuits. At the same time, more empirical research is needed to investigate emerging pedagogies in online learning using visualization technologies, as the R2D2 model suggests.

Hands-on Learning for Kinesthetic Learners

The fourth quadrant of the R2D2 model involves having learners applying what they have learned, reflected on, and visualized in practice exercises or in the real world. Such learning links well with kinesthetic learners, who need to try out, experience, imitate, and practice concepts and ideas in order to learn them more deeply. Fortunately, the Internet is increasingly offering hands-on experiences or activities for online learners, especially in the science areas.

One obvious way to apply learning is through the use of cases, scenarios, and simulations. These learning methods situate learners in rich contexts or authentic problems where they can test their knowledge or solutions against that of their instructor, their peers, or an expert. Cases now exist on the Web in almost any field of study from anthropology to zoology. In the medical field, for example, cases allow one to obtain case information, order lab tests, make diagnoses, and compare one's solution to an expert's (see http://www.medcases.com/Physician/cme_portal.asp). Similarly, in teacher education, pre-service teachers might interview for jobs in a simulated school, talk to school counselors, teachers, librarians, and principals about particular students or situations, and make decisions about problem cases (see <http://www.simteacher.com/>). In these online experiences, the goal is to engage learners in the content by allowing them to physically manipulate contents or variables and observe the results of those manipulations.

There are varying degrees of authenticity in online cases. For instance, in the real-time case approach (Theroux, Carpenter, & Kilbane, 2004), a full-time case writer is located in an existing company thereby enabling students to experience and discuss real events as they unfold. Online learners might not simply manipulate existing data, they might also collect and analyze it. Students and instructors may use any available technology including online chats, teleconferencing, threaded discussion forums, and video conferencing.

Another idea for placing students in the real world is to have them conduct market research and interesting educational research using online polls and surveys. Real-world research enables learners to not only explore concepts in real-world settings, but

also potentially discover and share new knowledge. Authentic activities in fully online and blended environments also offer opportunities for sustained inquiry, the examination of a task from multiple perspectives, interdisciplinary learning, and the creation of more polished and meaningful final products (Oliver, Herrington, & Reeves, 2006).

Of course, there are many other ways for learners to collect real-world information with educational technologies. For example, students might interview famous people or those who lived through different historical events (e.g., World War II, the Vietnam War, etc.) and post those oral histories in an online podcast or digital movie. In expanding on the idea of oral histories, tools such as the VideoPaper Builder™ (see <http://vpb.concord.org/?version=print>) enable students to juxtapose a digital movie against a paper they have written. Using such a tool, a student might back up key points in a paper with video snippets of key events. Or, in teacher training, pre-service teachers might reflect on how their performances (as seen in Webcasts and other video tools) compare to state or national standards. Another interesting tool to enable students to take charge of their own learning is the use of an iPod for podcasting their own radio stations and shows. And with the emergence of video-capable iPods, there are numerous other applications where students become designers of knowledge.

At the end of an online course, students might also produce final class products which are made available for an audience beyond the instructor. For example, student final projects might be posted to the Web in an online gallery for expert, teacher, or peer evaluation and feedback (Oliver & McLoughlin, 1999; Oliver, Omari, & Herrington, 1998). The first author of this article used this method in training rural teachers how to integrate technology into their curriculum (see <http://www.indiana.edu/~tickit/projectgallery/gallery.htm>).

In effect, the fourth quadrant of the model expects students to apply their new knowledge and further extend learning by doing something such as making case decisions, conducting scientific experiments, and collecting and analyzing real-world data. For example, Ou and Zhang (in press) introduced various ways of integrating databases in teaching, including using live, dynamic, real-world databases from the Internet for students to experience firsthand scientific discoveries in different subject areas, or through interdisciplinary inquiries. Similar learning activities can be conducted in online environments as well. In courses where instructors might give up more control over the curriculum, learners might also take ideas from a course or module and create unique products or ideas. In either case—using existing resources or creating new ones—the learner is trying out ideas and concepts, instead of simply listening about them, reflecting on them, or seeing visual depictions of them as in the first three quadrants of the R2D2 model.

Discussion

Tools, resources, and activities for distance education are proliferating at a time of increasing demand for online education (Bonk, 2004). There are extensive opportunities to address learners with different styles of learning or learning preferences, including those who prefer words or text, reflective activities, visual

representations, or hands-on activities. The R2D2 model enables instructors to consider learners and learning activities in each quadrant, potentially providing a more engaging and enriching environment for online learning. In addition, this model offers a learning and problem-solving process that moves from the acquisition of content to the reflection and visualization of it, and finally, to its actual use. As an instructional design model, it provides both a macro lens on processes that an instructor or instructional designer should consider in designing an online class, as well as a window into specific ideas that might work in successfully delivering it. In effect, it is an organizing aid for the distance educator. And, perhaps more importantly, the Read, Reflect, Display, and Do (i.e., R2D2) model is easy to remember and versatile to apply! With the increasing availability of learning technologies and virtually limitless pedagogical potential of such technologies, the R2D2 model lays out exciting opportunities to better address the needs for more versatile teaching and learning in online environments.

Naturally, there are many open issues and questions that still need to be sorted out with this model as well as various limitations. Among the most pressing issues and questions is whether self-reported assessments of learning styles at the start of a class will help instructors better deliver their online courses. In addition, are there more extensive learning gains and greater knowledge transfer in courses that use the R2D2 method over those that do not? In terms of limitations, it is obvious that many ideas cut across multiple quadrants of the model. At the same time, that also adds to the power of this model since some learning activities address more than one type of learner; and the model offers a means to make sense of the complexities and opportunities within online teaching and learning. The applications of the R2D2 model in designing and delivering online courses may take technology integration to a new level in distance education, and, more importantly, they may lead to positive changes in online pedagogical practices, learner experiences and overall sense of satisfaction, and course and program success ratios. May the force be with all of those who attempt to take the R2D2 model on such research and development journeys in the coming years as well as those who embed this model in their own online teaching and learning practices!

Note

1. We realize that these activities could easily be positioned in the fourth quadrant of the R2D2 model but place them here since they involve writing while most of the other tasks in the fourth quadrant do not.

Notes on Contributors

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Thiagi (2003)

Yell out

Number & have
audience pick &
tell a story

Seven Secrets of Effective Training Design

By Sivasailam "Thiagi" Thiagarajan

1. Let the real work be the testing instrument.

Use authentic assessment as the end point for training.

2. Keep it open.

Avoid closed questions. Exploit open questions.

3. Content is everywhere.

Wrap interactive strategies around content resources.

4. Throw everything into the blender

Blend online with nonline, active with passive, traditional with innovative, structured with unstructured, self-paced with collaborative, training with PI interventions, and learning with work.

5. Let the inmates run the asylum.

Let the learners teach and test each other and design training materials for their successors.

6. Build the airplane while flying it.

Analyze during and after design. Tweak the package after every delivery.

7. Plug in everything into templates.

Use frames, shells, and templates for presenting content and structuring activities.

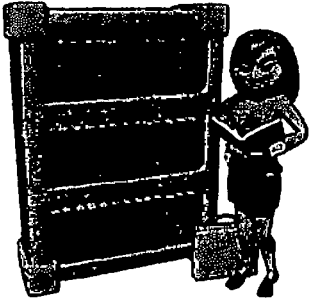
8. Avoid fun. Go with the flow.

Make it possible for participants to change the difficulty level.

9. Under-promise and over-deliver.

Promise them six, give them nine.

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15 Stories for 15 Years

1. 1993-1994: Peace, dude, hop off the return key, save me some stress."
2. 1995: What if Vygotsky had lived to 100...
3. 1996: Do not ride your bike to work.
4. 1997: You're en"TITLE"d to Dream!
5. 1997-1998: Look out for the Russians...
6. 1999: Do you believe in the power of sharing?
7. 1999-2000: Do you want to be target practice?
8. 2001: You were in, but you were never there.
9. 2002-2007: Who needs a TICKIT?
10. 2003-2006: Where is Disneyland?
11. 2004-2006: Data at your fingertips.
12. 2006-2007: A synchronous life is a Breeze!
13. 2006-?: Is there a blended expert in the house?
14. 2006-?: Where is a Wikibookian when you need one?
15. 2007-?: You can be a YouTubian too!

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Bank (2007)

Audience Picks Story





What are 10 ideas you can use from today?

(Top Ten List)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Top Three Activity:

What were the three most important ideas presented at this session?



**Important
Enough to
Write Down**

**Pretty
Important
(but not sure if
best)**

**Pivotal!!
These are
Highly, Highly
Important**

1.

2.

3.

4.

5.

Group Share #1

Group Share #2

Bonk's Bingo Board (Name: _____)

Directions: write down strategy and briefly how it would work. Yell out "Bingo" if you complete a row, column, or diagonal.

	B	I	N	G	O
Galaxy of Online Learning (R2D2)	Blended	Verbal	Reflective	Visual	Hands-On
Vocational and Technical Education					
Undergraduate classes					
Graduate classes					
Corporate, Government Training, or Military					
Other: _____ Institute, Consulting, Professional Development					

Final Project Option B, C, or D: Website Evaluation

R546 (Bloomington and Indy via videoconferencing)
Instructional Strategies for Thinking, Collaboration, and Motivation
Curtis J. Bonk, Instructor

NAME: _____ Title or Topic: _____

Option B. Research Proposal on Instructional Strategies

Doctoral students might focus more on research ideas and select Option B. For instance, you might conduct a pilot test of an instructional approach. Alternatively, you might observe and code the teaching techniques used by one instructor or a series of instructors. Or, you might observe a student “think aloud” as he uses a learning strategy or technique. Instead of that, you might perform action research in a course that you are teaching. For instance, you might try out a cooperative learning, or, more specifically, a cooperative reading technique like reciprocal teaching, cooperative scripts, or CIRC. Please turn in a maximum of 10 single-spaced pages, exclusive of references, appendices, chats, and tables.

Option B. Research Proposal:

- I. Title Page (Name, affiliation, topic title, acknowledgments)
- II. Review of the Literature
 1. Intro to Topic/Problem (purpose, history, importance) (1 page)
 2. Review of Literature (contrast relevant literature on the topic) (2-3 pages)
 3. Statement of Hypotheses/Research Q's (what do you expect to occur) (1 page)
- III. Method Section (2-3 pages)
 1. Subjects and design (i.e., sample, who and how assigned to groups)
 2. Materials/setting (i.e., hardware, software, text, models, figures)
 3. Dependent measures/instruments (i.e., tests)
 4. Procedure (i.e., training)
 5. Other (i.e., coding, other materials)
 6. Experimental analyses or comparisons
- IV. Results and Discussion (OPTIONAL): 1. Antic/dummied results; 2. Discussion of results
- V. References (APA style: see instructor for examples)
- VI. Appendices (pictures, figures, graphs, instruments, charts, models, coding criteria, etc.)

60 points: Scoring: (1-10) if for 60 points

Grading Scale from Options B, C, or D (Note 1 (low) to 10 (high) for each of the following criteria):

- ___ 1. Review of the Problem, Issue, and Literature (interesting, relevant, current, organized, thorough)
- ___ 2. Relevancy (linked to content of the course, connections to course, fulfills task expectations)
- ___ 3. Implications/Future Directions (important, generalizability, options available, research focus)
- ___ 4. Overall Richness of Ideas (richness of information, elaboration, originality, uniqueness)
- ___ 5. Overall Coherence (clarity, unity, organization, logical sequence, synthesis, style)
- ___ 6. Overall Completeness (adequate info presented, fulfills task, no gaps/holes, precise, valid pts)
- ___ Total Score

Special Comments/Suggestions/Interesting Points/Questions to Ponder/Other:

Signature: _____ Date: _____

Final Project Option E: Website Evaluation

R546 (Bloomington and Indy via videoconferencing)
Instructional Strategies for Thinking, Collaboration, and Motivation
Curtis J. Bonk, Instructor

NAME: _____

Title or Topic: _____

60 points: Scoring: (1-10) if for 60 points

Grading Scale from Option E (Note 1 (low) to 10 (high) for each of the following criteria):

1. Organization of the Web Materials or Web Site (easy to navigate, well laid out).
2. Currency and Relevancy of the Materials (useful, current, handy, needed, relevant).
3. Originality and Creativity (creative spark here, uniqueness, novelty, catchy).
4. Scope and Depth of Web Materials (comprehensive, complete, appeals to broad audience).
5. Effort (digging deep, extensive depth displayed here, work-work-work-work, persistence).
6. Overall Activity and Design (significant, important, valuable, well worth the effort).

_____ Total Score

Special Comments/Suggestions/Interesting Points/Questions to Ponder/Other:

Signature: _____

Date: _____

August 26, 2019, Week 1: Education 3.0 and R2D2 & TEC-VARIETY Models
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 1 Agenda:

1. Marker board activity (6 minutes). **Task:** Fill the board with pedagogical ideas (labels and initials).
 - a. Center marker board: Creativity theory/ideas, Creativity strategies
 - b. Right marker board: Critical theory/ideas, Critical thinking strategies
 - c. Left marker board: Motivation theory/ideas, Motivation strategies
 - d. Back marker board: Cooperative/Collab learning theory/ideas; Collab strategies
2. Circle back through the board and check things you agree with (Bonk to discuss).
3. Phillips 66 + 3T: **Table Top Talking (3T):** Lord of the Rings Tables (Pick a name: the Giants, Eagles, Wolves, Gollums, Ents (Tree-like creatures), Dwarfs, Dragons, Wizards, Elves, Orcs, Humans, and Sorcerers and the Dark Lords): 4-6 per table for 6 minutes: 1-2 Visiting Scholars; 2-3 enrolled students (and 1 group leader)
 - a. Give your group a name (pick from the above).
 - b. Brainstorm in groups your prior knowledge about instructional strategies.
 - c. Roundtable: Everyone lists a strategy and explains it and pass the paper.
 - d. Assign group leader to write down key points.
 - e. Add to 5-10 items to the board (include group name).
 - f. Summarize as a class.
4. Phillips 66 Part 2: What do you already know about R546 content and the syllabus?
 - a. Brainstorm in groups your prior knowledge about this class.
 - b. Assign group leader to write down key points
 - c. Add to 5-10 items to the board.
 - d. Present results in team competitions.
 - e. Summarize as a class.
5. Bonk to briefly explain the syllabus and agenda (15 minute cap).
 - a. Course history.
 - b. Course texts.
 - c. Book of Readings PDF.
 - d. Book recommendations.
 - e. Guest speaker(s).
 - f. Fall break.
 - g. Online Website demonstration.
 - h. Course goals: creative inspiration, innovation, mushy brain, labels, integration.
 - i. Student questions and discussion.
6. Kahoot quiz review
7. Introduce participants:
 - a. Visiting scholars
 - b. Prior students...current students...
 - c. Others.
8. Comedy: Three things you know about the syllabus and this course.
9. **Break #1...(Book Selections)**

10. Brainstorm: What is Education 3.0?
11. Curt Bonk presents on Education 3.0 and Education 20/20
 - a. Complete Bingo board #1
- 12. Break #2 (brief)**
13. Curt Bonk to recap some of 100+ instructional strategies (actually 40+).
 - a. Discussion and class activities and demonstrations.
 - b. Reflection: 3 best.
 - c. Complete back of Bingo Board #1...
14. Ball toss: Name a strategy or activity.
- 15. Break #3 (more book selections)**
16. Curt Bonk to present 20 more pedagogical activities and ideas
17. Bonk to present his R2D2 model and newest examples and ideas.
 - a. Bingo game #2.
 - b. Student questions and discussions.
 - c. Find 1-2 resources mentioned...
18. Bonk to present his TEC-VARIETY model and newest examples and ideas.
 - a. Back of Bingo game #2.
 - b. Any questions?
 - c. Find online resources mentioned.
19. Say goodbye! Say Goodbye Song!
20. For next week...

**September 2, 2019, Week 2: More Education 3.0 and Course Activities Recap and
Cooperative Learning Basics**
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 2 Agenda:

1. Brainstorm: What is Education 3.0?
 - a. Right marker board: What is Education 3.0? Principles? Questions?
 - b. Center board: What do you remember about 20 instructor roles? Any examples?
 - c. Left board: What do you remember about 20 LAST principles of instruction?
 - d. Back marker board: What do you remember about the 40 instructional strategies presented near the end of last week?
 - e. Circle back through the board and check things you agree with or remember.
2. Return to 5 Lord of the Rings Tables (Ents, Gollums, Wizards, Humans, Dark Lords, Dragons?): (and 1 group leader)
3. Phillips 66: Six minutes discuss what remember from last time about Education 3.0 talk.
 - a. Flip Chart Paper Activity: So what is Education 3.0?
 - b. Post the flip chart paper on the board.
 - c. Numbered Heads Together activity
4. Curt Bonk to present 50+ more pedagogical activities and ideas (e.g., Planted questions, Little known fact activity, Talking String, Human graph, Psychic message, Creative dramatics, Stand and share, Three word activity, One Stay, Three Stay, Reverse Brainstorming, Talking String, Just in Time Teaching, Goals and Expectations, One Visual, 8 Nouns Activity, etc.)
 - a. Can Definitely Use, Might Use, Can't Use
 - b. Best 3 Activity
 - c. Ball toss: Name a strategy or activity.
 - d. Yellow stickies on best 3
- 5. Break #1**
6. Curt Bonk to present his R2D2 model and newest examples and ideas.
 - a. Bingo game #2.
 - b. Student questions and discussions.
 - c. Find 1-2 resources mentioned...
7. Bonk to present his TEC-VARIETY model and newest examples and ideas.
 - a. Back of Bingo game #2.
 - b. Any questions?
 - c. Find online resources mentioned.
- 8. Break #2**
9. Marker board activity. Task: Fill the board with pedagogical ideas (labels and initials).
 - a. Center marker board: R2D2 principles and theory
 - b. Right marker board: R2D2 strategies and ideas
 - c. Left board: TEC-VARIETY motivational principles (i.e., what does it stand for?)
 - d. Back board: TEC-VARIETY strategies and ideas
 - e. Circle back through the board and check things you agree with.
10. What do you already know about R2D2 and TEC-VARIETY?
 - a. What do you already use or know?
 - b. Add to 5-10 items to the board.

11. Bonk to present on Cooperative and Collaborative Learning
12. Break #3...
13. Videotape: Cooperative learning or Jigsaw
 - a. David Johnson on CL: <https://www.youtube.com/watch?v=Sf1AH5WleEI>
 - b. Roger Johnson on CL: <https://www.youtube.com/watch?v=bL3oJDLpc6M>
 - c. Elliot Aronson: Jigsaw classroom: <https://www.youtube.com/watch?v=2p1AE3Z3j5I>
 - d. CL Deeper Edutopia https://www.youtube.com/watch?v=rWEwv_qobpU
 - e. Plan future: <https://www.teachingchannel.org/videos/collaborative-learning-strategy>
14. Cooperative Teaching Script activity
 - a. **Group 1:** Basic Elements: p. 410 and Cooperative Learning Summary: p. 509
 - b. **Group 2:** Differences cooperative learning and traditional p. 405 and p. 408
 - c. **Group 3:** What is cooperative learning? pp. 406-407
 - i. Rotate outside to Table 1, Table 2, or Table 3
 - ii. Return to teach your group what you learn
 - iii. Report back to the class.
15. Say goodbye! Say Goodbye Song!
16. Review items in the Packet of handouts

September 9, 2019, Week 3: Cooperative Learning Basics
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 3 Agenda:

1. Marker board activity. Task: Fill the board with pedagogical ideas (labels and initials).
 - a. Center marker board: R2D2 principles and theory
 - b. Right marker board: R2D2 strategies and ideas
 - c. Left board: TEC-VARIETY motivational principles (i.e., what does it stand for?)
 - d. Back board: TEC-VARIETY strategies and ideas
 - e. Circle back through the board and check things you agree with.
 - f. Massive Recap Review : (Ents, Gollums, Wizards, Humans, Dark Lords, Dragons?)
2. Groups Discuss 40+ (40) strategies and R2D2 and TEC-VARIETY models.
 - a. Sticky note recap review (individual)
 - b. 10 strategies can use (individual)
 - c. Select “Best 3” could teach today.
 - d. Any variations?
 - e. Discussion, comments, and questions.
3. Dr. Bonk to present on Cooperative and Collaborative Learning
 - a. Popplet on cooperative and collaborative learning: <http://popplet.com/app/#/2039068>
4. **Break #1**
5. Dr. Bonk to continue to present on Cooperative and Collaborative Learning
6. Videotape: Cooperative learning or Jigsaw
 - a. David Johnson on CL: <https://www.youtube.com/watch?v=Sf1AH5WleEI>
 - b. Roger Johnson on CL: <https://www.youtube.com/watch?v=bL3oJDLpc6M>
 - c. Elliot Aronson: Jigsaw classroom: <https://www.youtube.com/watch?v=2p1AE3Z3j5I>
 - d. CL Deeper Edutopia https://www.youtube.com/watch?v=rWEwv_qobpU
 - e. Plan future: <https://www.teachingchannel.org/videos/collaborative-learning-strategy>
7. **Break #2...**
8. Cooperative Teaching Script activity (count off: 1, 2, 3, 4, 5, 6)
 - a. **Group 1:** Basic Elements: p. 410 and Cooperative Learning Summary: p. 509
 - b. **Group 2:** Differences cooperative learning and traditional p. 405 and p. 408
 - c. **Group 3:** What is cooperative learning? pp. 406-407
 - i. Rotate outside to Table 1, Table 2, Table 3, Table 4, Table 5, and Table 6
 - ii. Discuss your handout.
 - iii. Merge tables 1 and 2; Merge 3 and 4; Merge 5 and 6.
 - iv. Discuss your combined handout.
 - v. Return to class to teach your group what you learn
 - vi. Report back to the class.
9. Review items in the Packet of handouts
10. Cooperative Learning Overview (include review of handouts in packet of readings):
 - a. PIGS Face (p. 409); CL Pondering Questions (p. 404)
 - b. Generic Methods (p. 399): **Stand, Raise Hand, Leg, etc. and Admit**
 - c. Building Positive Interdependence and Individual Accountability
 - d. Building Social Skills and Trust (4 F's) (pp. 430-435): Trust or group bonding: How do you

- create it? (favorite restaurant, pet type, relative, proudest accomplishment, if I were rich, a good movie, best part-time job, travel)
- e. Grouping Strategies (p. 416); Group Processing; Grading Strategies; Reaching Diff.
11. **Review of Key Pts: in book you read (so far) (Three Step Interviews)**
- Line up by date born. Pair up and group by month born.
 - In pairs, interview partner for 5 minutes (max) and jot down note:
 - What is important about this book?
 - What is interesting?
 - What is a dumb idea? (p. 526 & p. 528)
 - Reverse roles (for another 5 minutes)
 - Pairs join to form groups of four
 - Roundrobin sharing what you learned in the interview
 - Alt: Jigsaw into various chapter expert groups and summarize main pts.
12. **Break #3**
- Cooperative Learning Specific:
 - Reciprocal Teaching Part 1: <https://www.youtube.com/watch?v=8oXskcnb4RA>
 - Reciprocal Teaching Part 2: <https://www.youtube.com/watch?v=e8gSIcSyyPk>
 - Students Take Charge: RT: <https://www.youtube.com/watch?v=My68SDGeTHI>
 - Using Higher-Order Questions: Interview Annemarie Palincsar: <https://www.youtube.com/watch?v=XZ4LFxGi0mI>
 - Reciprocal Tchg Activity (Roles: Tchr, #1, #2, #3, #4, Jim, Barbara...) p. 458-459
13. Project-Based Learning
- Intro to PBL (Edutopia): https://www.youtube.com/watch?v=dFySmS9_y_0
 - 5 keys to PBL: https://www.youtube.com/watch?v=hnzCGNnU_WM
 - Picture possibilities (California): <https://www.youtube.com/watch?v=EFt6qW0Pb4c>
 - PBL Start to finish: <https://www.youtube.com/watch?v=-OWX6KZQDoE>
2. **Structured Controversy Task**
- You will be assigned to 1 of 4 groups (Group by car drive). Prepare to make 3-4 arguments for the position you have been given using your text, lecture, and video.
 - Reciprocal teaching gives too much power to the learners
 - PBL gives too much focus on learners and not enough on teachers.
 - Create a controversy...
 - Students
 - Quiz on cooperative learning from packet of handouts (p. 404 and p. 413).
14. **Solid vs. Fuzzy about PBL in Groups of Four**
- Three Stay, One Stray--Buzz Groups--Roundtable.
 - Alt #1: #d Heads Together (Count off 1, 2, 3, 4) & Roundrobin & Blackboard Share.
15. 13 Reading assignments: pp. 449-452.
- Read, Summarize, and Discuss: Convince others that yours is best.
 - Game #6: Group Grope perhaps on Project-Based Learning
 - Coop reading with different purposes: teacher, parent, principal, student
16. Simple Structures: circle those you have used or know about...(pp. 490-499)

September 16, 2019, Week 4: Critical Thinking (and end Coop Learning)
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 4 Agenda:

1. Administrivia: Dress culturally or different day is next week--wear something from your homeland, something nifty or cute, favorite clothes, something old or from another age.
2. Plan for Week 8 and Task #1 and Task #2 are due today (or 4 days from now).
3. Pre-class Board Game and Warm-up activity:
 - a. **Right board:** PBL is highly beneficial
 - b. **Right board:** PBL has problems (i.e., too much focus on learners and not enough on teachers; etc.)
 - c. **Back board:** Aspects or principles of project-based learning (PBL)?
 - d. **Left board:** Value Line: Rate your organization, university, or school administrators support or interest in PBL
4. Project-Based Learning and Collaborative Learning
 - a. 5 keys to PBL (Peg Ertmer): https://www.youtube.com/watch?v=hnzCGNnU_WM
 - b. Picture possibilities (California): <https://www.youtube.com/watch?v=EFt6qW0Pb4c>
 - c. Intro to PBL (Edutopia): https://www.youtube.com/watch?v=dFySmS9_y_0
 - d. PBL Start to finish: <https://www.youtube.com/watch?v=-OWX6KZQDoE>
5. **Structured Controversy Task: The Great Debate**
 - i. PBL gives too much focus on learners and not enough on teachers.
 - ii. PBL is highly effective
 - iii. Reciprocal teaching gives too much power to the learners
 - iv. Reciprocal teaching is highly effective
6. **Solid vs. Fuzzy about PBL in Groups of Four**
 - a. Three Stay, One Stray--Buzz Groups--Roundtable.
 - b. Alt #1: #d Heads Together (Count off 1, 2, 3, 4) & Roundrobin & Blackboard Share.
7. 13 Reading assignments: pp. 449-452.
 - a. Read, Summarize, and Discuss: Convince others that yours is best.
 - b. Game #6: Group Grope perhaps on Project-Based Learning
 - c. Coop reading with different purposes: teacher, parent, principal, student
8. Simple Structures: circle those you have used or know about...(pp. 490-499)
9. Two Notecards: 1 with questions about cooperative learning. 1 with controversial issues.
10. Collaborative and Cooperative Learning Review quiz (bells and whistles)...
11. **Break #1**
 - a. **Left board:** Value Line: Rate your organization, university, or school administrators support or interest in creative thinking, critical thinking, and cooperative learning.
12. **Low Medium High**

1-2-3-4-5-6-7-8-9-10	1. Creative Thinking
1-2-3-4-5-6-7-8-9-10	2. Critical Thinking
1-2-3-4-5-6-7-8-9-10	3. Cooperative Learning
13. **Bonk to lecture on critical thinking (pp. 293-294; 358-362).**

- a. Key aspects of critical thinking; 8 ways to fail; Critical Thinking Defined; 6 Aspects of Critical Thinking; Highlights from the CT research
14. **CT Videos:**
- Video #1: Critical Thinking Series:** <https://www.youtube.com/watch?v=GzV1pNQX5s>
 - Video #2: Critical Thinking:** <https://www.youtube.com/watch?v=J0yEAE5owWw>
 - Video #3: Critical Thinking:** <https://www.youtube.com/watch?v=6OLPL5p0fMg>
15. Fat and Skinny Questions: discuss/explain (page 311-312)
- (Note: Think Sheets, Procedural Facilitation, Guided Questions)
 - Fat Questions: require lots of discussion and explanation with interesting examples and take time to think through and answer in depth.
 - Skinny Q's: require simple yes/no/maybe or a 1 word answer or nod or head shake and take
16. Critical thinking Checklist and Definition
17. **Break #2**
18. Evaluation Questions, Blooms Taxonomy, Think Sheets, Procedural Facilitation, Guided Questions
- a. Bloom: p. 313-314
 - b. Think sheet questions: p. 315-317
19. PMI on the video
20. K-W-H-L/K-W-L (What did you know?, What do you want to know?, What did you learn?)-
21. Force Field Analysis: Your final assignment (p. 320-325)
22. Summing Up, Minute papers revisited
23. **Break #3**
24. Idea Listing Activities (many are Edward de Bono's Methods)
- 1. APC: Alt's, Possibilities, & Choices (The tasks) (This is CR BS!)**
 - 2. FIP: First Important Priorities (e.g., what tasks to do for this class)**
 - 3. AGO: Aims, Goals, Objectives**
 - 4. OPV: Other People's Views**
 - 5. C&S: Consequence & Sequel (of an action or decision)**
 - 6. CAF: Considering All Factors: (a) Buying a second hand car, (b) Choosing a place to live.**
 - 7. FI - FO: Info In (Already accounted for) - Info Out (Unknown/still needed)**
 - 8. EBS: Examining Both Sides of an Argument**
 - 9. ADI: Agree, Disagree, Irrelevant**

September 23, 2019, Week 5: Critical Thinking Defined and Explained
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 5 Agenda:

1. Administrivia #1: Return Task #1 and Task #2.
2. Administrivia #2: Bring a hat next time (if you can).
3. Today: Dress culturally/differently sharing
4. Writing warm-up: Count off 1, 2, 3, 4.
 - a. **Person #1 (red name tags):** Minute papers what learned last week.
 - b. **Person #2 (yellow name tags):** Muddiest point papers on last week.
 - c. **Person #3 (green name tags):** Plus, Minus, Interesting on last week.
 - d. **Person #4 (blue name tags):** K-W-L on last week. (What did you know?, What do you want to know?, What did you learn?)
5. Bonk Lecture: Finish module on critical thinking
6. PMI on the video on creative thinking
7. Force Field Analysis: Your final assignment (p. 320-325)
8. Reflection on Idea Listing Activities (count off 1 to 9): Who in your group is facing an important decision (e.g., wedding, move, new purchase, house, car, career/major, etc. (many are Edward de Bono's Methods; p. 335)
 - 1's. Happy: APC: Alternatives, Possibilities, & Choices (The tasks)
 - 2's. Sleepy: FIP: First Important Priorities (e.g., what tasks to do for this class)
 - 3's. Doc: AGO: Aims, Goals, Objectives
 - 4's. Bashful: OPV: Other People's Views
 - 5's. Grumpy: CAF: Considering All Factors: (a) Buying 2nd hand car, (b) Choosing a place to live.
 - 6's. Happy: FI - FO: Info In (Already accounted for) - Info Out (Unknown/still needed)
 - 7's. Sneezey: EBS: Examining Both Sides of an Argument
 - 8's. Dopey: Consequence and Sequel (of an action or decision): short term, midterm, and long-term
 - 9's. Snow White: ADI: Agree, Disagree, Irrelevant
9. Evaluative Questions:
 - a. Case A (IU-B): Higher Ed considering funding a CR/CT center
 - b. **Case B (IUS and IUPUD): High School is considering a course on CT & CR thinking**
10. Critical thinking tests and assessments
 - a. Cornell Test of Critical Thinking (see handout)--Try questions 1-10.
 - b. A Disposition Inventory: p. 366
 - c. Picture completion; p. 363-365
11. **Break #1**
12. SWOT Options (p. 329):
 - a. Dedicated blended IST master's program in Singapore;
 - b. Virtual/online IST master's program with China;
 - c. New requirement: all IU graduate students who want to teach in college must take R546;
 - d. Creation of a new center called GET-IT or Center for "Globally Enhancing Thinking, Instructional, and Technology."
13. Visual Thinking Activities and Graphic Organizers (pp. 351-357)
 - a. Cmaps, diagrams, flowcharts, graphs, attribute wheels

- b. Venn Diagrams (e.g., compare CR & CT)
 - c. Categorization/Classification Schemes:
 - d. Taxonomies, timelines, outlines, advance organizers, main idea tables
 - e. Semantic Feature Analysis: (e.g., 12 or 14 LCPs by grade or domain)
 - f. Mnemonics--acrostics, acronyms, pegword, story, link, keyword, bizarre
14. Nominal Group Process: You are a commissioned team looking at building a third wing in the School of Education. The overall budget is \$15,000,000; you have been given \$2.5 million from the discretionary budget to spend. What should go in there? (p. 318)
 15. Goal Concretization, p. 334
 16. Working Backward, Pruning the tree activity: I am thinking of a critical thinking technique
 17. Debate: teach critical thinking as a (a) separate course, (b) added on; or (c) embedded.
 18. Cost-Benefit Analyses--new course on CT/CR thinking skills for middle school/h.s. students.
 19. The name game... (Critical thinking and Cooperative/Collaborative Learning)
 - 20. Break #2**
 21. Bonk to Lecture on Creativity
 22. Creativity test (pp. 180-181) Gough Personality Test (pp. 261-262)
 23. Creative Whack Pack and other card packs (try activity #12, #1, and #2)
 - a. What can you do to teach or enhance creativity in your school/work setting?
 - b. Find a match.
 - c. Call to action.
 - d. How can you use these cards?
 24. Pick a model of Creative Problem Solving and try to improve it. (pp. 245-249)
 - (e.g., Polya, Osburn, Parnes, Oech, Wallas, AUTA, Torrance, BS, Future PS).
 - a. Share Models Selected...Is there a true problem solving process that works for you???
 - b. Assessment dilemmas: validity and reliability.
 - c. Fishbowl: on the model you selected
 25. **We need a Break #3...**
 26. Matching exercise
 27. Review of List of 25 creative thinking techniques (pp. 168-169).
 28. **More Tall Tale Story Telling...**
 29. Rearrange facts/what if (**Pick one** and write for a minute):
 1. What-if no one studied creativity and we had no understanding of creative processes?
 2. What-if no one assessed creativity? There were no cr measures or researchers?
 3. Just suppose you were in charge of curriculum? How would you address cr?
 4. What if we had standardized creativity or coop. learning tests in Indiana?
 5. What-if creative thinking was more prevalent in dogs than human beings?
 6. What is Education 3.0 was required by state governments? What would teaching be like?
 7. What if flipping the classroom was possible 30 years ago? What education be like now?
 8. What-if more creative people lived 20 years longer than non less creative?
 9. What if critical thinking was banned in K-12 schools?
 10. What would teaching creative thinking be like if we lived life in reverse...???
 11. Just suppose Indiana assessed the level of instructor or department thoughtfulness?
 30. Just suppose

September 30, 2019, Week 6: Creative Thinking Defined and Explained
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 6 Saturday Class Agenda:

3. **Warmup Activities:** Creativity tests: (1) Davis (pp. 180-181); (2) Gough Personality Test (pp. 261-262); and (3) the Creative Behavior Inventory (Hocevar, 1979, 1980) (pp. 263-265)
4. Admin: Who would like to present something for 5 or 10 minutes in Week 8?
5. Review of List of 25 creative thinking techniques (pp. 168-169).
6. Tall Tale Story Telling...
7. Pick a model of Creative Problem Solving and try to improve it. (pp. 245-249)
(e.g., Polya, Osburn, Parnes, Oech, Wallas, AUTA, Torrance, BS, Future PS).
 - a. Share Models Selected...Is there a true problem solving process that works for you???
 - b. Assessment dilemmas: validity and reliability.
 - c. Fishbowl: on the model you selected
8. Creative Whack Pack and other card packs (try activity #12, #1, and #2)
 - a. What can you do to teach or enhance creativity in your school/work setting?
 - b. Find a match.
 - c. Call to action.
 - d. How can you use these cards?
9. **We need a Break #1...**
10. Rearrange facts/what if (**Pick one** and write for a minute on a notecard):
 1. What-if no one studied creativity and we had no understanding of creative processes?
 2. What-if no one assessed creativity? There were no creativity measures or researchers?
 3. Just suppose you were in charge of the curriculum? How would you address creativity?
 4. What if we had standardized creativity or critical thinking tests in your city?
 5. What-if critical or creative thinking was more prevalent in dogs and cats than human beings?
 6. What if Education 3.0 ideas were endorsed by governments? What would teaching be like?
 7. What if creativity were common in schools 30 years ago? What education be like now?
 8. What-if more creative people lived 20 years longer than those that are less creative?
 9. What if critical and creative thinking was banned in K-12 schools?
 10. What would teaching for creative thinking be like if we lived life in reverse...???
 11. Just suppose your schools assessed the level of instructor or department creativity?
11. Bonk to Lecture on Creativity
12. Finding New Patterns, Juxtaposing Ideas, Seeing Functional Fixity, etc...
13. Dead Poets Society
 - a. Barbaric Yawp: <https://www.youtube.com/watch?v=gQU3EphIpMY>
 - b. Understanding Poetry: <https://www.youtube.com/watch?v=LjHORRHxtyI>
 - c. What will your verse be?: https://www.youtube.com/watch?v=R_zsMwCOoEs
 - d. Oh Captain, my Captain: <https://www.youtube.com/watch?v=j64SctPKmqk>
 - e. Carpe Diem: https://www.youtube.com/watch?v=0wjpRQ_IsI
 - f. Carpe Diem: <https://www.youtube.com/watch?v=veYR3ZC9wMQ&index=3&list=RDj64SctPKmqk>
14. Make Shift Fishbowl: What if taught like this, would you be fired. (Front Row, Back Row)

- a. Six Hats and other hats
- 15. The Creativity Case: Class Discussion with 27 Thinking Roles (p. 194)
- 16. **We need Break #2...**
- 17. Bonk to Lecture on Creativity (e.g., Synectics: Direct, Personal, and Fantasy Analogies)
- 18. Flexibility/Breaking Set Activity
 - a. New Perspectives, Metaphoric Thkg, Analogies, Synectics, Breaking Set, Imagery, Aesthetics,
- 19. Finding New Patterns, Juxtaposing Ideas, Seeing Functional Fixity, etc...
- 20. See: Word games; Which one is different; Nine dots (p. 229); Flying Pig; Davis; Synectics: Direct, Personal, and Fantasy Analogies; Concealed colors, sentences/words; 13 original colonies
- 21. Go through course packet of handouts.
- 22. Creativity (rate yourself, fill out handout)--Are you creative?
 - a. Experimental-safekeeping self-rating: Find your spot pp. 183-184
 - b. von Oech's Explorer, Artist, Judge, Warrior pp. 187-188
 - c. Right vs. Left Brained, pp. 238 & 240
- 23. Break #3**
- 24. More Creative Dramatics (Davis' 5th edition, pp. 297-306):
 - a. Imagine taste/smell...People Machines, Imagine hear, touch, smell, tastes.
 - b. Invisible ball tossing.
 - c. Just Imagine: served in Vietnam.
 - d. Favorite animal poses, ridiculous poses, stiffest/most rubbery, angriest/happiest.
 - e. Mirrors, puppets, ice cubes.
- 25. Creativity Techniques
 - a. Tell a tall tale...give an example of an idea squelching statement. What do you see? How is creativity squelched here. Please use 3-4 idea squelching statements in your story.
 - 1. Which idea squelcher are the most common for you? Create a new one.
 - 2. Stand and sit...give an example of an idea squelching statement.
 - b. Object Obituary--write an obituary for an object you recently trashed...
 - c. Metaphorical Thinking: On the meaning of creativity: 1. Creativity is like _____. Being Creative is like _____. Creativity is to ___ as...
 - d. Morphological Synthesis
- 26. More Creative Reflection Exercises:**
 - a. *Wet ink* on most constructivist/hands-on high school teacher. She/he was like a _____.
 - b. *Wet Ink II*. Just imagine: imagine you have created a psychologically safe envir...What do you see? Can students wonder, question, speculate, take risks, active listening, respect for ideas, withhold judgment, seek justification??? How is creativity fostered here? Describe environment. Physically, mentally, emotionally, etc...
- 27. Brainstorming--more is better, wilder the better, hitchhiking encouraged, no eval, combine
 - a. *Brainstorm*: ways to increase use of creative thinking in schools?
 - b. *Reverse BS*: ways to decrease use of creative thinking in schools?
- 28. Synapse School: <https://www.synapseschool.org/>
- 29. **John Cleese on Creativity:** Below is the comedian who is a creativity specialist as well as an actor and an instructional designer. John Cleese: [Wikipedia](https://en.wikipedia.org/wiki/John_Cleese). Homepage: <http://www.thejohncleese.com/>; movies: <http://www.imdb.com/name/nm0000092/>
- John Cleese on Creativity in Management: <https://www.youtube.com/watch?v=Pb5oIIPO62g> (36:59)
- John Cleese on Creativity: <https://www.youtube.com/watch?v=DMpdPrm6UI4> (10:36)
- Silly Job Interview: <https://www.youtube.com/watch?v=zP0sqRMzkwo&t=35s> (4:06) 6 million views.

October 7, 2019, Week 7: Creativity Part 2 and Motivation Part 1
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 7 Saturday Class Agenda:

1. Ice Breaker Warm up: Scrambled Cities (p. 121) and I.Q. Test (p. 122)
2. Setting up Week 8 presentations and book returns.
3. Polling Wall: 1. Are you creative? 2. Can we accurately test for creativity? 3. Can we teach students to be significantly more creative? 4. Which is the most important unit module in this course?
4. Rearrange facts/what if (**Pick one** and write for a minute on a notecard):
 1. What-if no one studied creativity and we had no understanding of creative processes?
 2. What-if no one assessed creativity? There were no creativity measures or researchers?
 3. Just suppose you were in charge of the curriculum? How would you address creativity?
 4. What if we had standardized creativity or critical thinking tests in your city?
 5. What-if critical or creative thinking was more prevalent in dogs and cats than human beings?
 6. What if Education 3.0 ideas were endorsed by governments? What would teaching be like?
 7. What if creativity were common in schools 30 years ago? What education be like now?
 8. What-if more creative people lived 20 years longer than those that are less creative?
 9. What if critical and creative thinking was banned in K-12 schools?
 10. What would teaching for creative thinking be like if we lived life in reverse...???
 11. Just suppose your schools assessed the level of instructor or department creativity?
5. Bonk to Lecture on Creativity
6. Finding New Patterns, Juxtaposing Ideas, Seeing Functional Fixity, etc...
7. Dead Poets Society
 - a. Barbaric Yawp: <https://www.youtube.com/watch?v=gQU3EphIpMY>
 - b. Understanding Poetry: <https://www.youtube.com/watch?v=LjHORRHXYI>
 - c. What will your verse be?: https://www.youtube.com/watch?v=R_zsMwCOoEs
 - d. Oh Captain, my Captain: <https://www.youtube.com/watch?v=j64SctPKmqk>
 - e. Carpe Diem: https://www.youtube.com/watch?v=0wjpRQ_IsI
 - f. Carpe Diem: <https://www.youtube.com/watch?v=veYR3ZC9wMQ&index=3&list=RDj64SctPKmqk>
8. Make Shift Fishbowl: What if taught like this, would you be fired. (Front Row, Back Row)
 - a. Six Hats and other hats
9. **Break #1**
10. Creativity testing (pp. 180-181). Handout packet pp. 17-18.
11. Creativity (rate yourself, fill out handout from yesterday)--Are you creative?
 - a. Experimental-safekeeping self-rating: Find your spot pp. 183-184
 - b. von Oech's Explorer, Artist, Judge, Warrior pp. 187-188
 - c. Right vs. Left Brained, pp. 238 & 240
12. Creativity Assessment
 - a. Torrance: Cardboard Boxes (Activity #5: Unusual Uses)
 - b. Remote Associations Test
 - c. Williams: Parent/Teacher Rating (try for a son, daughter, cousin)

- d. Schaefer: Creativity Attitude Survey
- 13. Go through course packet of handouts.
- 14. Flexibility/Breaking Set Activity
 - a. New Perspectives, Metaphoric Thkg, Analogies, Synectics, Breaking Set, Imagery, Aesthetics,
- 15. Finding New Patterns, Juxtaposing Ideas, Seeing Functional Fixity, etc...
- 16. See: Word games; Which one is different; Nine dots (p. 229); Flying Pig; Davis; Synectics: Direct, Personal, and Fantasy Analogies; Concealed colors, sentences/words; 13 original colonies
- 17. Future Problem solving videos in YouTube.
- 18. Break #2**
- 19. More Creative Dramatics (Davis' 5th edition, pp. 297-306):
 - f. Imagine taste/smell...People Machines, imagine hear, touch, smell, tastes.
 - g. Invisible ball tossing.
 - h. Just Imagine: served in Vietnam.
 - i. Favorite animal poses, ridiculous poses, stiffest/most rubbery, angriest/happiest.
 - j. Mirrors, puppets, ice cubes.
- 20. Brainstorming--more is better, wilder the better, hitchhiking encour, no eval, combine
 - c. *Brainstorm*: ways to increase use of creative thinking in schools?
 - d. Reverse BS: ways to decrease use of creative thinking in schools?
- 21. Idea Squelching statements (pages 185 and 193)
- 22. *Wet ink* on most constructivist/hands-on high school teacher. She/he was like a _____.
- 23. *Wet Ink II*. Just imagine: imagine you have created a psychologically safe envir...What do you see? Can students wonder, question, speculate, take risks, active listening, respect for ideas, withhold judgment, seek justification??? How is creativity fostered here? Describe environment. Physically, mentally, emotionally, etc...
- 24. Metaphorical Thinking: On the meaning of creativity: 1. Creativity is like _____. Being Creative is like _____. Creativity is to ____ as...
- 25. Break #3**
- 26. Attribute Listing, Modification, and Transformation (Davis pp. 178-186); SCAMPER
 - a. Attribute Webbing/Listing: "XYZ" shapes, colors, sizes, purpose, numbering.
 - b. Attribute Modification: "XYZ"--after listing attributes, think of ways to improve each.
 - c. Alternative Uses: Uses for "XYZ" for this class or for teaching in general. (find the second best or third best suggestion)
 - d. Attribute Transferring: "XYZ"--transfer ideas from one context to the next. (with idea spurring questions--p. 80; Davis 195. (What else is this like? What have others done? What else is this like? What could we copy? What has worked before?) (What can we borrow from a carnival, funeral parlor, track meet, wild west)
 - e. Idea Spurring Questions: how MAXimize, MAGnify, arrangeRE, combine-adapt, subtutesti, EEEEXXAAGGGGEEERRRAATTTEEE, *add new twist*, modifie, ChAnGe
- 27. Object Obituary (or Activity or Teaching Approach Obituary)--write an obituary for an object you recently trashed...or a teaching method or activity you will no longer use.
- 28. Morphological Synthesis.
- 29. Review #1: The name game... (Critical, Creative, Cooperative—Count off 1, 2, 3)
- 30. Review #2: Ball Toss (What-if?)
- 31. Bonk Bingo R546 Review Quiz...

October 14, 2018, Week 9: Motivation and Presentations
R546: Instructional Strategies for Thinking, Collaboration, and Motivation
Instructor: Curt Bonk, Indiana University

Week 8 Saturday Class Agenda:

1. 8:00-8:10 Turn in Final assignments
2. 8:10-8:40 Presenters...
3. 8:40-9:10 Bonk Bingo R546 Review Quiz...
4. 9:10-9:30 **Break #1**
5. 9:30-10:30 Motivation Lecture: Part 1 Theory
6. 10:30-10:45 **Break #2**
7. 10:45-11:45 Motivation Lecture: Part 2 Practice: Various Motivational Activities
8. Coat of Arms (see Book of Handouts, p. 118-119).
 - #1: a recent Peak Performance;
 - #2: something very few people know;
 - #3: draw a symbol of how you spend your free time;
 - #4: fill in something you are really good at;
 - #5: write in something that epitomizes your personal motto.
9. Self-disclosure introductions... (p. 120) (2 objects brought with you)
 - a. Take out two items (e.g., family pictures, credit cards, rabbits' feet, book you're reading)
 - b. Describe themselves (e.g., "I am superstitious")
 - c. State name with an adjective starting with 1st letter of 1st name.
(e.g., Quick Curt, Marvelous Mary, Dancing Diane)
 - d. Now intro self & also by a nickname current, past, or potential nickname.
(ask others what it means during break)
 - e. Brainstorm a list of questions you would like to ask the others...
(e.g., My person I most admire is? The best book I ever read?)
10. Treasure Hunt (p. 123).
11. Accomplishment Hunt: Turn in 2-3 accomplishments (e.g., past summer, college, life)
12. Motivation (Best of the Best Competition)
 - a. 33 highlights of research on strategies for motivating to learn (Jere Brophy)
 - b. 150 ways to increase intrinsic motivation (James Raffini)
 - c. 1001 ways to energize employees (Bob Nelson)
 - d. 200 ways to motivate secondary students (pp. 91-105)
13. 11:45-12:00 **Break #3**
14. 12:00-12:15 What goes into your creative space?
15. 12:15-12:30 Object reflections on class so far...(pass out objects)
16. 12:30-12:50 Quick Summaries of Other student Projects
17. 12:50-12:55 Psychic Massage of instructors....and students?
18. 12:55-1:00 Sad Goodbye

**R546: Instructional Strategies for
Thinking, Collaboration, and Motivation
Extra Handouts
Curt Bonk, Indiana University
Fall 2019**

Technology Integration Presentation

Two Models of Technology Integration:

Framework/Model #1: R2D2

Curt Bonk, Indiana University

	Ideas Definitely Can Use	Ideas Might Use	Ideas Can't Use	Questions and Comments
1. Read				
2. Reflect				
3. Display				
4. Do				
Across Phases				

Technology Integration Presentation

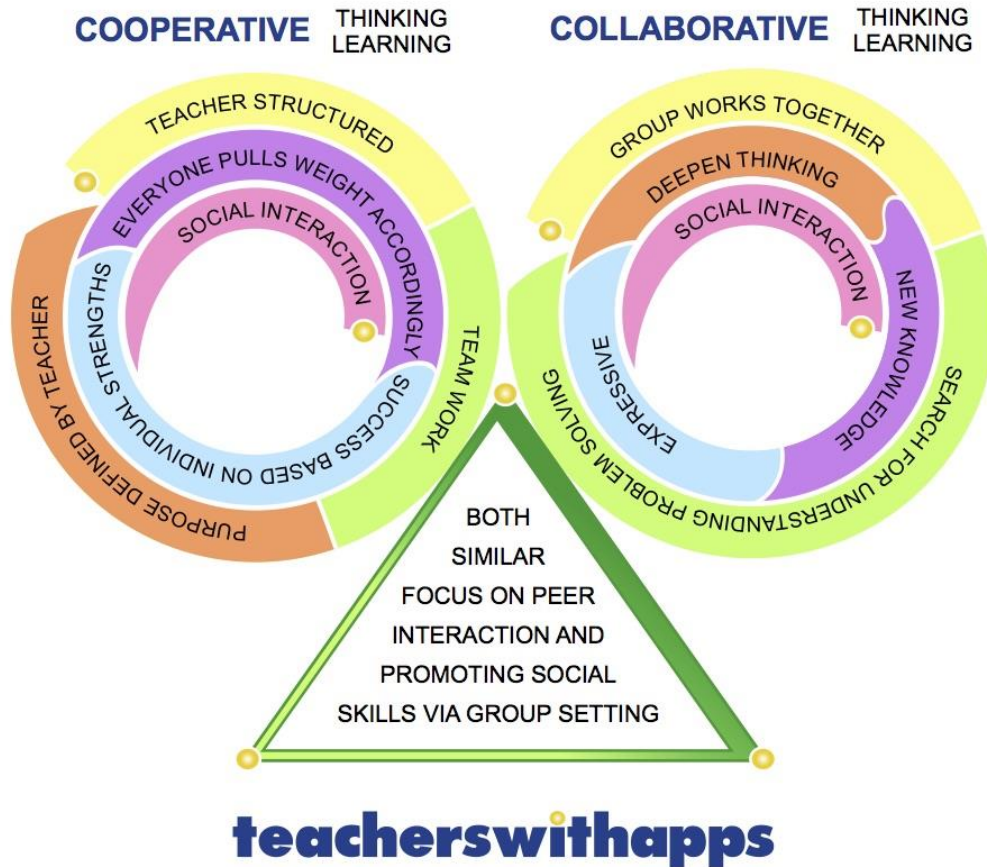
Two Models of Technology Integration: Framework/Model #2: TEC-VARIETY

Curt Bonk, Indiana University

	Ideas Definitely Can Use	Ideas Might Use	Ideas Can't Use	Questions and Comments
1. Tone and Climate				
2. Encouragement and Feedback				
3. Curiosity and Intrigue				
4. Variety and Novelty				
5. Autonomy and Choice				
6. Relevance, Meaningful, Authentic, and Interesting				
7. Interactive and Collaborative				
8. Engagement and Involvement				
9. Tension and Challenge				
10. Yielding Products, Goals, and Purpose				

The Difference in Cooperative Learning & Collaborative Learning
BY JAYNE CLARE · MARCH 3, 2015 · [BLOG, TEACHER TOOLS](http://www.teacherswithapps.com)

<http://www.teacherswithapps.com/the-differences-in-cooperative-learning-collaborative-learning/>



Cooperative Learning is an instructional strategy that simultaneously addresses academic and social skill learning by students. It is an instructional strategy and has been reported to be highly successful in the classroom because of its increasing need for interdependence in all levels, providing students with the tools to effectively learn from each other. Students work towards fulfilling academic and social skill goals that are clearly stated. It is a team approach where the success of the group depends upon everyone pulling his or her weight.

Collaborative learning is commonly illustrated when groups of students work together to search for understanding, meaning, or solutions or to create an artifact or product of their learning. Further, collaborative learning redefines traditional student-teacher relationship in the classroom because activities can include collaborative writing, group projects, joint problem solving, debates, study teams, and other activities in which students team together to explore a significant question or create a meaning project.

Sample Creativity Test (R546)

I. Rate yourself on 1-10 scale (do #21 if you skipped one):

SCALE:

	1 2 3 4 5	6 7 8 9 10
___	1. censors	feels
___	2. evaluates	takes risks
___	3. reassures & supports	takes risks
___	4. analyzes	makes connections
___	5. is realistic	plays
___	6. looks at consequences	speculates
___	7. is logical	is curious
___	8. alert to danger	sees the fun in things
___	9. avoids surprises	likes surprises
___	10. avoids wrongness	open to anything
___	11. punishes wrongness	in touch with total experience
___	12. is serious	does not mind being confused
___	13. is pessimistic	is optimistic
___	14. is judgmental	focus on what is going for the idea
___	15. argue	waste no energy evaluating early
___	16. inattention/distant	listen and interested
___	17. be noncommittal	wholly open to being available
___	18. correct and precise	set up win/wins--nobody loses
___	19. dominant/commands	deal with as an equal--eliminate rank
___	20. point out flaws	see the value in/assume valuable implications
___	21. fearful	is impetuous

(over)

II. Now rate yourself on the following items on a 1-10 scale (10 being high and 1 being low).

SCALE: Low Medium High

1 2 3 4 5 6 7 8 9 10

- ___ 1. self-confident
- ___ 2. risk-taking
- ___ 3. high in energy
- ___ 4. stubborn
- ___ 5. curious
- ___ 6. playful, childlike
- ___ 7. resists domination
- ___ 8. enthusiastic
- ___ 9. wide interests
- ___ 10. non-participation in class activities
- ___ 11. good sense of humor
- ___ 12. idealistic
- ___ 13. reflective
- ___ 14. uncooperative
- ___ 15. need privacy, alone time
- ___ 16. artistic interests
- ___ 17. capriciousness
- ___ 18. low interest in details
- ___ 19. too emotional
- ___ 20. adventurous
- ___ 21. aesthetic interests
- ___ 22. attracted to novelty, complexity, and the mysterious
- ___ 23. sometimes uncommunicative
- ___ 24. forgetful, absentmindedness, mind wanders
- ___ 25. egocentric
- ___ 26. too demanding
- ___ 27. autonomous
- ___ 28. open-minded
- ___ 29. ambitious
- ___ 30. temperamental
- ___ 31. sloppiness and disorganization with unimportant matters
- ___ 32. dresses differently
- ___ 33. does things different from standard procedures
- ___ 34. imaginative
- ___ 35. is full of ideas
- ___ 36. is a "what if?" person
- ___ 37. high verbal, conversational ability
- ___ 38. not afraid to try something new
- ___ 39. uses all senses in observing
- ___ 40. ability to regress and transform items

The Creative Insights of Heraclitus (as interpreted by Roger von Oech)

1. The cosmos speaks in patterns.
2. Expect the Unexpected, or you won't find it.
3. Everything flows.
4. You can't step in the same river twice.
5. That which opposes produces benefit.
6. A wonderful harmony is created when we join together the seemingly unconnected.
7. If all things turned to smoke, the nose would become the discerning organ.
8. The Sun will not exceed its limits, because the avenging Furies, ministers of Justice, would find out.
9. Lovers of wisdom must open their minds to very many things.
10. I searched into myself.
11. Knowing many things doesn't teach insight.
12. Many fail to grasp what's right in the palm of their hand.
13. When there is no sun, we can see the evening stars.
14. The most beautiful order is a heap of sweepings piled up at random.
15. Things love to conceal their true nature.
16. Those who approach life like a child playing a game, moving and pushing pieces, possess the power of kings.
17. Sea water is both pure and polluted: for fish it is drinkable and life-giving; for humans undrinkable and destructive.
18. On a circle, an end point can also be a beginning point.
19. It is disease that makes health pleasant, hunger that makes fullness good, and weariness that makes rest sweet.
20. The doctor inflicts pain to cure suffering.
21. The way up and the way down are one and the same.
22. A thing rests by changing.
23. The barley-wine drink falls apart unless it is stirred.
24. While we're awake, we share one universe, but in sleep we each turn away to a world of our own.
25. Dogs bark at what they don't understand.
26. Donkeys prefer garbage to gold.
27. Every walking animal is driven to its purpose with a whack.
28. There is a greater need to extinguish arrogance than a blazing fire.
29. Your character is your destiny.
30. The sun is new each day.

Critical Thinking Methods Activity

Curt Bonk, R546

Idea Listing Activities (many are Edward de Bono's Methods)

1. K-W-L (What did U know?, What do U want to know?, What did U learn?)
2. PMI: Plus, Minus, Interesting
3. APC: Alt's, Possibilities, & Choices (The tasks) (This is CR BS!)
4. FIP: First Important Priorities (e.g., what tasks to do for this class)
5. AGO: Aims, Goals, Objectives
6. OPV: Other People's Views
7. C&S: Consequence & Sequel (of an action or decision)
8. CAF: Considering All Factors
9. FI - FO: Info In (Already accounted for) - Info Out (Unknown/still needed)
10. EBS: Examining Both Sides of an Argument
11. ADI: Agree, Disagree, Irrelevant

Issues and Decisions:

1. Should we add more videoconferencing locations in Indiana for this class? e.g., near Chicago? Fort Wayne? South Bend? Near Louisville? IU East? Etc.
2. Should we add more international videoconferencing locations for this class (e.g., Beijing and Shanghai given all the Chinese scholars in this class; What about Helsinki? Mumbai? Taipei? Singapore? Auckland? Tel Aviv? Hanoi? Etc.)?
3. Should IU Bloomington build another parking lot near the School of Education?
4. Can the world stop the Zika virus?
5. Should countries of the world partner together and set their sights on Mars with space exploration?
6. How quickly does the world need to move from coal and gas power to solar power, wind power, or something else to avoid global warming?
7. Should the United States take more refugees from Syria?
8. Should Facebook add even more buttons? For example, a "Strongly Dislike" button?
9. Should healthcare providers offer incentives to workers to get their blood pressure to 120 or below?
10. Should the School of Ed library in Bloomington be shrunk to make room for offices?
11. Should the School of Education add a third wing to showcase research and add additional floor space?
12. Should Twitter allow twice as many characters?
13. How can the Virgin Islands, Houston, North and South Carolina, and Florida better prepare for hurricanes?
14. Should the state of Indiana provide more funding using tolls and taxes for finishing the new highway 69?
15. Should new federally funded jobs like disaster relief specialist be created to deal with hurricanes, severe, storms, oil spills, explosions, etc.?
16. Should the IST program offer a special master's degree to people in Singapore only?
17. Should IU have bigger signage and more signs at the entrance to campus?

Bloom's Taxonomy

Meanings of Bloom's Level of Questions

Levels	Definition	Verbs
Knowledge	Questions about <u>facts</u>	list, recall, memorize
Comprehension	Questions of <u>understanding</u> of facts	explain, reword
Application	Questions of <u>using</u> the facts	solve by, organize to prove
Analysis	Questions <u>taking apart</u> information	break down, compare, put into categories
Synthesis	Questions <u>putting together</u> information in a new way	create, compose, reorganize
Evaluation	Questions of judgment or <u>value</u> of information	rate, choose, justify

Knowledge Level I	Comprehension Level II	Application Level III	Analysis Level IV	Synthesis Level V	Evaluation Level VI
define find identify know list locate match memorize name recall recite relate repeat say	describe discuss explain express identify interpret locate recognize report restate review reword summarize tell translate	apply calculate demonstrate diagram dramatize employ extrapolate graph illustrate operate practice schedule sketch solve transfer try use	analyze compare- components debate deduce detect differentiate discover distinguish examine experiment infer inventory question reduce test	compose construct design develop formulate hypothesis manage organize originate plan produce propose	appraise assess choose compare and contrast decide estimate evaluate grade judge rank rate select value

Knowledge (get the basic facts)

list, match, write, recall, know, summarize, who, what, where, when, say in your own words, observe and write, memorize, arrange, put into categories, select, name, tell about, group, show, underline, find, choose, label, spell, pick, point to, say

Comprehension (understand the facts)

explain, show, demonstrate, change, reword, interpret, alter, transform, retell, account for, recognize, offer, propose, submit, define, translate, convert, expand, outline, vary, spell out, restate in your own words

Application (use the facts)

apply, select, solve by, organize, choose, interview, make use of, experiment with, try, operate, relate, put to use, handle, put into action, utilize, record, model, construct, demonstrate through, put together

Analysis (select, examine, and break apart by facts)

breakdown, inspect, divide, take away, dissect, put into categories, examine, uncover, survey, group, analyze, test for, study, classify, identify the parts for, search, clarify, discover, contrast, compare, simplify, take apart

Synthesis (put the basic information back together in a new way)

create, design, develop, discuss, build, imagine, compare, re-order, make, compose, combine, form, compile, blend, construct, predict, invent, reorganize, contrast, make up, estimate, suppose, rearrange, alternate, originate

Evaluation (value, judge, accept or reject facts)

rank, evaluate, rate, judge, measure, choose, criticize, justify, determine, conclude, grade, select, award, recommend, reveal, dispute, rule on, decide, defend

Bloom's Taxonomy

Knowledge	Knowledge of specifics (What is the principal ingredient in the air we breathe?) Knowledge of ways and means of dealing with specifics (What steps would you have to take to become a licensed operator? What is the correct form for presenting a motion before a meeting?) Knowledge of universals and abstractions (What is the basic principle behind the operation of a free market?)
Comprehension	Translation (In your own words what does "laissez-faire economy" mean? What does it mean to say that to the victor belongs the spoils?) Interpretation (In what ways are the Democratic and Republican positions on support for the military budget similar?) Extrapolation (If the use of electrical energy continues to increase at the present rate, what will be the demand for electrical energy in A.D. 2000?)
Application	(If you measure the pressure in your barometer at the foot of the mountain and then measure it again at the summit of the mountain, what difference in the reading would you expect? If of two sailing vessels leaving New York at the same time en route to London one took a route following the Gulf Stream and one kept consistently south of the Gulf Stream, which would you expect to reach London first, everything else being equal?)

Analysis	<p>(Questions that ask pupils to break complex ideas down into their component elements in order to make them more understandable.)</p> <p>Analysis of elements (Which part of the argument we have just read is fact and which is opinion? What propaganda devices can you find in this automobile advertisement?)</p> <p>Analysis of relationships (Does the conclusion that Senator X made logically follow from the facts he presented?)</p> <p>Analysis of organizational principles (In this poem what devices has the author used to build up the characters of the principal antagonists?)</p>
Synthesis	<p>Production of unique communication (Describe the procedure you used and the results you observed in the experiment.)</p> <p>Production of a plan or a proposed set of operations (How would you go about determining the composition of this unknown chemical?)</p> <p>Deviation of a set of abstract relations (You have heard the description of the situation. What might be the causes of this situation?)</p>
Evaluation	<p>Judgment in terms of internal evidence (In what ways is the argument presented illogically?)</p> <p>Judgment in terms of external criticism (Does the theory that organically grown foods are more healthful than other foods conform to what we know of the chemical composition of these foods? Explain)</p>

Images of Schools (Workplaces) Through Metaphor (ISM): Actual Form

Directions: Think about where you work or teach. What is it **actually like** working at this place? Indicate the extent to which you agree/disagree with each of the following 40 metaphors. Rate on a scale of 1 (Strongly Disagree) to 10 (Strongly Agree).

- ___ 1. My school (workplace) is a Mental Straight-jacket.
- ___ 2. My school (workplace) is a Military Camp.
- ___ 3. My school (workplace) is a Ghetto.
- ___ 4. My school (workplace) is a Prison.
- ___ 5. My school (workplace) is a Family.
- ___ 6. My school (workplace) is an Artist's Palette.
- ___ 7. My school (workplace) is a Team.
- ___ 8. My school (workplace) is a Negotiating Area.
- ___ 9. My school (workplace) is a Culture.
- ___ 10. My school (workplace) is an Exhibition.
- ___ 11. My school (workplace) is an Orchestra.
- ___ 12. My school (workplace) is a Garden.
- ___ 13. My school (workplace) is an Expedition.
- ___ 14. My school (workplace) is a Herd.
- ___ 15. My school (workplace) is a Museum.
- ___ 16. My school (workplace) is a Machine.
- ___ 17. My school (workplace) is a Hospital.
- ___ 18. My school (workplace) is a Nursery.
- ___ 19. My school (workplace) is a Labor Ward.
- ___ 20. My school (workplace) is a Beehive.
- ___ 21. My school (workplace) is a Living Organism.
- ___ 22. My school (workplace) is a Theater.
- ___ 23. My school (workplace) is an International Airport.
- ___ 24. My school (workplace) is a Refuge.
- ___ 25. My school (workplace) is an Ocean.
- ___ 26. My school (workplace) is a Board Game.
- ___ 27. My school (workplace) is a Camping Trip.
- ___ 28. My school (workplace) is a Court Room.
- ___ 29. My school (workplace) is a Monastery.
- ___ 30. My school (workplace) is a Pressure Cooker.
- ___ 31. My school (workplace) is a Fraternity Party.
- ___ 32. My school (workplace) is an Olympic Games.
- ___ 33. My school (workplace) is a Brew Pub.
- ___ 34. My school (workplace) is a Zoo.
- ___ 35. My school (workplace) is an Amusement Park.
- ___ 36. My school (workplace) is a Casino.
- ___ 37. My school (workplace) is a Tour Bus.
- ___ 38. My school (workplace) is a Theme Park.
- ___ 39. My school (workplace) is a Video Arcade.
- ___ 40. My school (workplace) is a Laboratory.

Images of Schools (Workplaces) Through Metaphor (ISM): Ideal Form

Directions: Think about where you work or teach. What would you **ideally want** this place to be like? Then indicate the extent to which you agree/disagree with each of the following 40 metaphors. Rate on a scale of 1 (Strongly Disagree) to 10 (Strongly Agree).

- ___ 1. My school (workplace) is a Mental Straight-jacket.
- ___ 2. My school (workplace) is a Military Camp.
- ___ 3. My school (workplace) is a Ghetto.
- ___ 4. My school (workplace) is a Prison.
- ___ 5. My school (workplace) is a Family.
- ___ 6. My school (workplace) is an Artist's Palette.
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- ___ 38. My school (workplace) is a Theme Park.
- ___ 39. My school (workplace) is a Video Arcade.
- ___ 40. My school (workplace) is a Laboratory.

Active Learning Assessments (sample questions):

A. Reflection #1: A New Teacher Self-Assessment for active learning. (Bonk, 1995)

Rate: Never = 1; Seldom = 2; Sometimes = 3; Often = 4; Very Often = 5.

In my classes...

- 1. students have a say in class activities and tests.
- 2. I help students to explore, build, and connect their ideas.
- 3. students share their ideas and views with each other and me.
- 4. students can relate new terms and concepts to events in their lives
- 5. students work in small groups or teams when solving problems.
- 6. students use computers to help them organize and try out their ideas.
- 7. I give hints and clues for solving problems but do not give away the answers.
- 8. I relate new information or problems to what students have already learned.
- 9. students prepare answers with a partner or team b/4 sharing ideas with the class.
- 10. I ask questions that have more than one answer.
- 11. students take sides and debate issues and viewpoints.
- 12. students develop ideas from a variety of library and electronic resources.
- 13. students bring in information that extends across subject areas or links topics.
- 14. students suggest possible problems and tasks.
- 15. I provide diagrams or pictures of main ideas to make confusing info clearer.

B. Reflection #2: A Dept. Thoughtfulness Report Card: In this dept. (or class):

- 1. There is sustained examination of few topics, rather than superficial coverage of many.
- 2. The lessons display substantive coherence.
- 3. Students are given an appropriate amount of time to think.
- 4. Teachers carefully consider explanations and reasons for conclusions.
- 5. Teachers ask challenging questions and structure challenging tasks.
- 6. Teachers press students to justify or clarify assertions and answers.
- 7. Teachers try to get students to generate original ideas, explanations, and solutions.
- 8. Teachers are a model for thoughtfulness.
- 9. Students assume the roles of questioners and critics.
- 10. Students offer explanations and reasons for their conclusions.

C. Reflection #3: Student Thinking Report Card (Excerpts from **Teacher Assessment of Student Thinking** from John Barrell, 1991, Teaching for Thoughtfulness, Longman Publishing).

Rating Scale:

1 = completely false (F); 2 = mostly F; 3 = partly F/T; 4 = mostly True; 5 = completely True

- 1. The student is very interested in ideas.
- 2. The student works well in discussion groups.
- 3. The student can express ideas clearly.
- 4. The student cannot tell which ideas are more important.
- 5. The student can often combine many ideas into one idea.
- 6. The student runs out of ideas quickly.
- 7. The student can often suggest ideas not mentioned before.
- 8. The students thinking is not well organized.
- 9. The student is a lazy thinker.
- 10. The student asks good questions.
- 11. The student likes to try difficult problems.
- 12. The student cannot concentrate for too long.
- 13. The plans the student makes are well thought out.
- 14. The student has trouble making decisions.
- 15. The student can think well about a wide range of things.

Big Picture Revisited

a. What can teachers do to "assist" in student learning?

Ten Techniques To Assist In Learning: (Bonk & Kim, 1998; Tharp, 1993)

1. Modeling (illustrating and verbalizing invisible performance standards);
2. Directly Instructing (provide clarity, needed content, and missing information);
3. Coaching (observe and supervise in guiding toward expert performance);
4. Scaffolding and Fading (supporting what learner can't do and later removing support);
5. Cognitive Task Structuring (explaining/organizing the task within zones of development);
6. Questioning (requesting a verbal response using a mental function learner can't yet do);
7. Articulating and Dialoguing (encouraging description/summary of reasoning processes);
8. Reflecting (fostering self-reflection and analyses of previous performances);
9. Exploring (pushing student discovery and application of problem solving skills);
10. Managing & Feedback (giving performance feedback and positive reinforcement).

b. What resources exist for a learning environment? (Bonk, Hay, & Fischler, 1996).

Answer is eight different things:

- (1) Teachers, (2) Peers, (3) Curriculum/Textbooks, (4) Technology/Tools, (5) Experts/Community, (6) Assessment/Testing, (7) Self Reflection, (8) Parents.

c. Matrix of Active Learning Resources

Directions: Fill in the matrix grid by look at the intersection of resources and teaching techniques and place a plus ("+") to indicate whether it is possible, a negative ("-") to indicate it may not be possible, and a questionmark ("?") when you are uncertain if it is possible.

	1. Tchrs	2. Peers	3. Texts	4. Tech. Tools	5. Experts	6. Assess	7. Self	8. Parents
1. Model								
2. Directly Instruct								
3. Coach								
4. Scaffold & Fade								
5. Cogn. Task Structure								
6. Question								
7. Articulate & Dialogue								
8. Reflect								
9. Push to Explore								
10. Manage and Feedback								

Motivation Research Highlights (Brophy)

1. Supportive, appropriate challenge, meaningful, moderation/optimal.
2. Teach goal setting and self-reinforcement.
3. Offer rewards for good/improved performance.
4. Novelty, variety, choice, adaptable to interests.
5. Gamelike, fun, fantasy, curiosity, suspense, active.
6. Higher levels, divergence, dissonance, interact with peers.
7. Allow to create finished products.
8. Provide immediate feedback, advance organizers.
9. Show intensity, enthusiasm, interest, minimize anxiety.
10. Make content personal, concrete, familiar.

Other Classroom Motivation Tips

(Alexander, class notes, Pintrinch & Schunk, 1996; Reeve, 1996; Stipek, 1998):

1. Include positive before negative comments.
2. Wish students “good effort” not “good luck”.
3. Give flexibility in assignments and due dates.
4. Communicate respect via tasks select and control.
5. Design interactive and interesting activities.
6. Use coop learning, debates, group discussions.
7. Minimize social comparisons and public evaluations.
8. Use relevant, authentic learning tasks.
9. Use optimal difficulty and novelty.
10. Use challenge, curiosity, control, and fantasy.
11. Give challenging but achievable tasks.
12. Create short term or proximal goals and vary these goals.
13. Give students different ways to demo what they know.
14. Encourage students to give and get help.
15. Attrib failure to low effort or ineffective strategy.
(Attrib success to effort or competence)
16. Give poor performing student the role of expert.

150 Ways to Motivate in the Classroom (Raffini, 1996)

1. Ice Breakers
(Treasured objects, birthday circles, treasure hunts, middle name game, accomplishment hunts, similarity wheels, who=s like me, coat of arms, self-disclosure intros, expectations charts, scrambled sayings)
2. Goal Cards, Goal Notebooks
(ST and LT with objectives and ideas how to achieve)
3. Floating A, Escape Clauses, Volunteer Assignments, etc.
(to be used on any assignment within 25 hours)
4. Self Report Cards, Self Evaluation
5. Discussion Questions, Issues, Problems, Solutions
(Perhaps answer questions of the other teams, talking chips)
6. Term Crossword Puzzles or Term Matching, Competitions, Dilemmas
7. Success Contracts and Choice Calenders
(Guarantee an A or B if fulfill contract provisions)
8. Positive Statements, Self Reinforcements
(Bury the “I can’t’s” and Save the “I Cans”)
9. Celebrations, Praises, Acknowledgments, Thank Yous, Put-Ups
(Multicultural days, trips, class awards, helpers, end of term)
10. Class Community Building
(Web Site and Digitized Web class photo, photo album, class project, teeshirts, field trips)
11. Democratic Voting, Student Interest Surveys, Class Opinion Polls
12. Random Acts of Kindness, Service Learning/Teaching, Volunteerism
13. Change Roles or Status
(Random roles, assume expert roles, switch roles for a day)

1001 Ways to Energize Employees (Bob Nelson, 1996)

1. Bank of Boston--4 informational days to work on special projects.
2. Honda--places individuals who know nothing about tech in design teams.
3. Hewlett-Packard--takes out of routine by putting new bus plans on trial.
4. Delta Land Survey--employees vote once/year on dress code, bonuses, etc.
5. Tandem Computers--promotions based on technical OR managerial merit.
6. Scitor Corp--no max number of sick days (ave. is 5 days/year--low).
7. Adobe Systems--set own hours & eligible for stock options & sabbaticals.
8. Matsushita--created research lab of 20 scientists free to explore any proj.
9. Dan Corp.--employees can spend \$500/project to improve efficiencies.
10. Worthington Industries--majority of employees must approve new hires.
11. Xerox--share ideas no matter rank, time clocks out & teams are in (trust).
12. Hi-Tech Hose--lumps all vacation, sick, & holidays in a single account.
13. Pitney-Bowes--consider displaced persons b4 turning to outside market.
14. Ventura--pushes to take time off outdoors as long as work is done.
15. Lands= End--encourages to express interest in any dept interested in.
16. Microsoft--encourages fun/playfulness (e.g., installing sod, sprinklers, lawn mowers in an office).
17. Walmart--managers wear jeans once/week to help line workers/staff.
18. Duke Power Co.--can post electronic message to change/swap jobs.
19. Saturn--employees can send anonymous messages to upper management.
20. Whole Foods--everyone can access sales, profit margins, & salaries.
21. Diesel Tech Corp--disabled products so employees can see how fit.
22. FedEx--internal newsletter with columns devoted to competitor info.
23. Levi Strauss--employees rate each other on teamwork, trust, communication.
24. Computer Specialists--clients rate workers & employees rate own perf.
25. Queen Mary Resort--brainstorms & votes once/month how to imp jobs.
26. Advanced Micro Devices--managers have quarterly breakfast with boss.
27. Motorola--has quarterly employee town meetings with rap sessions.
28. S.C. Johnson Wax--flew all employees of foreign buy-outs to the U.S.
29. Com-Corp--installed "screwup boxes" to tell manage what doing wrong.
30. Wired Magazine--two "living room" mtg areas--sofas, stereos, CDs, etc.
31. Microsoft--play basketball, frisbee, golf, etc. and be casual at work.
32. Sun Micro--designed forum spaces & sun rooms for spontaneous conversations.
33. Lands End--\$9 mil for activ ctr--pool, track, photo, gym, tennis, picnic tables, whirlpool, etc.
34. Southwest Air--1/4 of profit sharing funds must go to company stock.
35. Computer Media Tech--encour volunteer in soup kitchens, elderly homes, etc.
36. Xerox--social service leave program (1 month to a year) with pay.
37. Ben Jerry=s Homemade--set aside 1% of profits for peace programs.
38. Salem Sportswear--anyone with a tie beyond a certain pt is fined \$2.
39. Owens-Corning Fiberglass--open space mtg rooms, no agenda, no plans.
40. Nissan--uses Involvement Through Teamwork (ITT) to discuss probs.
41. Siemens Info Sys--created team of 23 young, talented employees under 40 to advise management.
42. Hewlett-Packard--has 24 hour labs for res'ers & encourage to spend 10% on personal projects.
43. AT&T--project team weekly outings to play darts & shoot pool.
44. United Airlines--allowed workers to swap assignments (reduced sick time).
45. Odetics--wacky stuff; telephone booth stuffing contests, bubble gum blowing, >50s day, yoga.
46. Hallmark Greeting Cards--creativity ctr with clay, paint, etc. to think up ideas.
47. Chiat Day (ad agency)--hangs punching bags of execs in break rooms.
48. Alagaso--Pres Mike Warren distrib "Hey Mike" cards & posters in firm.
49. Cooper Tires--for ownership, operators can stamp names inside tires produced.
50. Southwest Air--CEO kissed an employee who turned down a job offer (both males).

Some Ice Breakers

(Bonk, 1998; Raffini, 1996; Scannell & Newstrom, 1991; Thiagarajan, 1998)

1. Ice Breakers
 - a. Round I: Self-disclosure introductions (who are you, job, interests, hobbies)
2. Round II. Self-disclosure introductions...
 - a. Treasured Objects--Take out two items out of your wallet and describe how they best represent you (e.g., family pictures, credit cards, rabbits' feet) and share.
 - b. Describe themselves (e.g., "I am a tightwad," "I am superstitious")
 - c. State name with an adjective starting with 1st letter of 1st name.
(e.g., Marvelous Mary, Dancing Diane, Inscrutable Ida, Crusty Curt)
 - d. Now intro self & also by a nickname current, past, or potential nickname.
(ask others what it means during break)
 - e. Brainstorm a list of questions you would like to ask the others...
(e.g., The person I most admire is? The best book I ever read?)
 - f. Middle name game (state what middle name is and how you got it).
3. Expectations charts

What do you expect from this workshop, what are your goals, what could you contribute?

 - a. Write short and long terms goals down on goal cards that can be referenced later on.
 - b. Write 4-5 expectations for this workshop/retreat
 - c. Expectations Flip Chart: share of 1-2 of these...
4. Treasure hunts--fill out card with interests, where born, would like to live, strengths, job role, hobbies, etc. and find a match (find one thing in common and one thing different with everyone)
Pass out an Index Card: What is unique about you???
 - a. Favorite Sports/hobbies/past times (**upper left**)
 - b. Birthplace and Favorite cities to visit (**upper right**)
 - c. Current Job and Responsibilities (**lower left**)
 - d. 2 comments, things, or traits about yourself (e.g., team player, personable, talkative, opinionated, hate Purdue, like movies, move a lot, hate sports) (**lower right**)
 - e. Accomplishments you are proud of (**in the middle**)
5. Accomplishment Hunt
 - a. Turn in 2-3 accomplishments (e.g., past summer, during college, during life);
 - b. Workshop leader lists 1-2 of those for each student on a sheet without names.
 - c. Participants have to ask "Is this you?" If yes, get a signature.
6. Issues and Discussion Questions
 - a. make a list of issues people would like to discuss.
 - b. Perhaps everyone brings 2-3 questions or issues to the meeting.
 - c. Partner off and create a list and then collect question cards, and,
 - d. then distribute and your group must answer questions of the other groups.
7. Team brainteasers (IQ tests), scrambled cities, crossword puzzles, competitions, dilemmas, or unscrambled sayings.
8. Coat of Arms--fill in.
 - #1: a recent Peak Performance;
 - #2: something very few people know;
 - #3: draw a symbol of how you spend your free time;
 - #4: fill in something you are really good at;
 - #5: write in something that epitomizes your personal motto.

9. It'll Never Fly Wilbur
 - a. Introduce a new idea or concept or plan.
 - b. Everyone writes 4-5 problems they see in it.
 - c. Divide into groups of 3-4 and discuss concerns.
 - d. Each group writes down 3 roadblocks on a 3 X 5 card.
 - e. Facilitator redistributes so each group gets a different card.
 - f. Subgroups think creatively of how to solve those problems and share with group.
10. Birthday groupings--Nonverbally up by date of year born and partner off with person closest to you in b-day and then do...
11. Talking String--state what hope to gain from retreat (or discuss some other issue) as wrap string around finger; next ones state names of previous people and then state their reasons.
12. Divide into small groups of about six people and then hand out prepared list of 5 questions in increasing order of disclosure for participants to ask each other and then have someone stand and their group must describe him or her.
13. Psychic Massage (a closer activity)
 - a. Divide in teams of 3-5.
 - b. In alphabetical order of first names have someone turn his or back to the group
 - c. Team members must make positive, uplifting statements about that person behind his or her back but loud enough for others to hear them.
 - d. One minute per person.
14. Positive Strokes
 - a. 2-3 times during the session, each person fills out a 3 x 5 card about other participants.
 - b. They must complete sentences like: "the thing I like best about (name) is" and "the biggest improvement I saw in (name) is".
 - c. At the end of the day, the folded cards are passed out and read aloud and then given to the named person.
15. Community Building--common teeshirts, photo of group and perhaps put up on the Web. Put announcement of retreat on Web or newsletter.
16. Communication/Learning Visuals--Draw one or more of the following that you want to use during the training: Gun, cannon, noose, high fives, thumbs up, watch, toilet, smiley face, etc.
17. Ask how feel, what has happened, what did they learn, how might this help in workplace, ask "what if" things were different at work, and what's next???--how might they do things differently?
18. Have you ever questions:

Grown a garden? Presented at a conference? Worn a costume on Halloween? Met a famous politician? Been on the radio? Been on TV? Been in a parade? Performed the Heimlich maneuver? Walked on stilts? Surfed? Drank more than 10 cups of coffee in a 24 hour period? Owned a watch for more than 10 years? Tried on a straight jacket? Been to a morgue? Laid down inside a casket? Taken a Uber ride? Swum a mile in an ocean? Visited a winery? Owned a smart watch? Been a Boy Scout or Girl Scout? Shaved your head? Flown a drone? Flown a plane? Ditched a blind date? Water skied on one ski? Sky dived? Bungee jumped? Whitewater rafted a dangerous river? Been in a play? Milked a goat or a cow? Done back-to-back all-nighters? Completed a marathon? Broken a bone? Made an obscene gesture at someone when driving your car? Cheated on your income tax? Had a permanent tattoo? Run a toll booth? Had a hot cup of coffee spill on your lap? Been in the CN Tower in Toronto? Visited Canada? Mexico? Been above the Arctic circle or below the Antarctic Circle? Driven a race car? Slept in the forest?