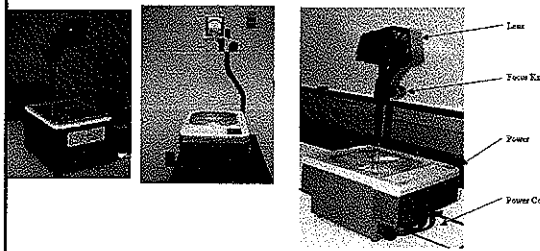


E-Learning Curriculum Design and Delivery: Best Practices

Dr. Curtis J. Bonk
Indiana University,
SurveyShare and CourseShare
<http://php.indiana.edu/~cjbonk>
cjbonk@indiana.edu



Part 1: Teaching Technology of 20th Century (Overhead Projector)



Teaching Technology of 1950 (Eric Hankam teaching the Watson Laboratory Three-Week Course on Computing, in Watson Laboratory, Columbia University, 612 West 116th Street, New York City, about 1950.)



And, of course...there is digital video...



EXCITEMENT IN LEARNING
NEW... low cost
Audio Visual Method
WITH OCCASIONAL CONTROL

Dramatic NEW Teaching Aid...

AMERICAN OPTICAL
OPAQUE PROJECTOR

DuKANE CORPORATION

During the past several years, the audio-visual method has become an integral part of the new procedure being followed in many schools. The demand for this method is increasing.

For the audio-visual method, the opaque projector is the most effective and most practical method of instruction.

Technology of the 1980s

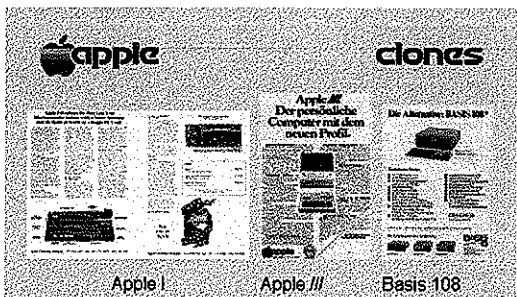
The New Tandy 1000 EX
Complete with one Color Monitor
— All in one package
Price: \$799

Tandy 1000 EX

A Great Christmas Gift for the Student!

For more information, call 1-800-451-7000.

Technology of the 1980s



Thinking Back 20 Years Ago



Of course, I was also studying psychology...



Ph. D.

At first, I got interested in cognitive psychology

Thompson 1991 An Information Processing Model

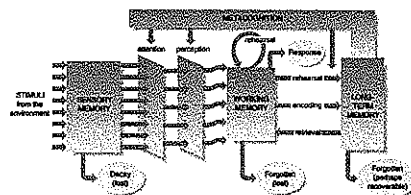
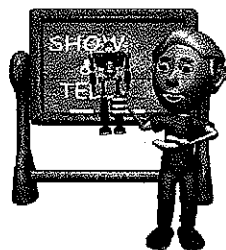


Figure 10.10 Educational Psychology: Windows on Classroom, 7th Edition

Copyright © 1991 by Glencoe/McGraw-Hill, a division of The McGraw-Hill Companies, Inc. All rights reserved.

And I minored in educational technology...




Instructional Philosophy and Available Technology



Ah, the Excitement of Instructional Design!




Most ID Models in the 1980s Prescriptive




Instructional Philosophy and Approaches

- In 1986 it is was about behavioral and prescriptive models
- In 2007 it is about constructivistic models, social context, inquiry, building communities of practice, promote learner-centered learning



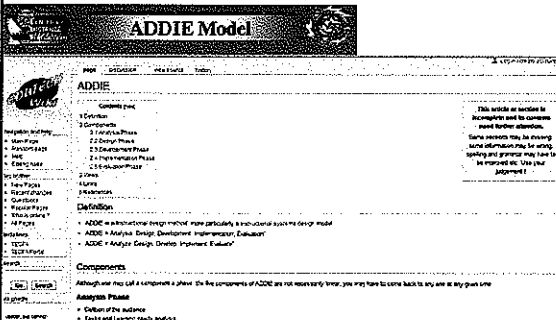
George Siemens (Sept 30, 2002, eLearnspace.org) Instructional Design in E-Learning

"In general, ID theory needs to move in the direction of flexibility and learner-empowerment if it is to allow ID to keep up with technological and institutional changes...."



ADDIE Model

<http://edutechwiki.unige.ch/en/ADDIE>



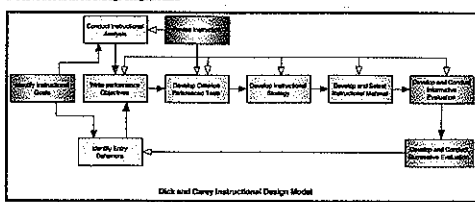
Dick and Carey Design Model

http://www.nwlink.com/~donclark/history_isd/carey.htm

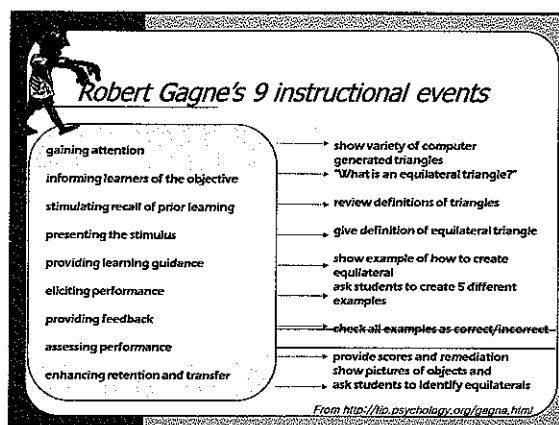
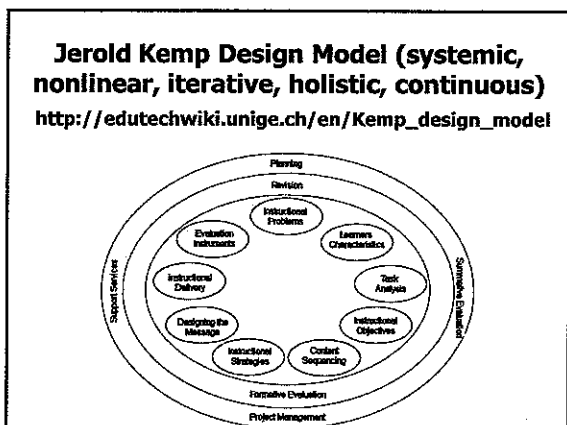
The Dick and Carey Model - 1978

Although there are several versions ISD, with an almost unlimited number of flavors, the ADDIE model probably reigns supreme, with the Dick and Carey model being close behind it.

Dick and Carey's model details a comprehensive and detailed process, however, it has been criticized for at the same time being too rigid and cumbersome for the average design process.



Dick and Carey Instructional Design Model



8 Conditions of Learning

Learning Condition	Definition
Signal Learning	The learner associates an already available response with a new stimulus or signal
Stimulus-Response Learning	The learner responds precisely to a discriminated stimulus
Chaining	The learner acquires a connection to a set of individual stimulus-responses in a sequence (two or more stimulus response connections equals a chain)
Verbal Association	The learning acquires a connection to a set verbal chains
Discrimination Learning	The learner makes different identifying responses to many different and seemingly similar stimulus
Concept Learning	The learner becomes capable of making a common response to a class of stimuli
Rule Learning	The learner recognizes a chain of two or more concepts
Problem Solving	The learner recalls and connects a combination of previously learned rules which can be applied to achieve a solution for a novel situation

- ### 5 Learning Outcomes
- **Verbal information** (this consists of a student stating desired information).
 - **Intellectual skills** (involves the student in knowing how to perform an act).
 - **Cognitive strategies** (internally organized capabilities that a learner employs in guiding his processes of attending, learning, remembering, and thinking).
 - **Attitudes** (internal states of organisms that influence actions).
 - **Motor skills** (activities such as driving a car or playing a musical instrument).

9 Instructional Events

Instructional Event	Internal Mental Process
1. Gain attention	Stimuli activates receptors
2. Inform learners of objectives	Creates level of expectation for learning
3. Stimulate recall of prior learning	Retrieval and activation of short-term memory
4. Present the content	Selective perception of content
5. Provide "learning guidance"	Semantic encoding for storage long-term memory

9 Instructional Events (cont'd)

Instructional Event	Internal Mental Process
6. Elicit performance (practice)	Responds to questions to enhance encoding and verification
7. Provide feedback	Reinforcement and assessment of correct performance
8. Assess performance	Retrieval and reinforcement of content as final evaluation
9. Enhance retention and transfer to the job	Retrieval and generalization of learned skill to new situation

9 instructional events (example)

1. gaining attention
show variety of computer generated triangles
2. informing learners of the objective
"What is an equilateral triangle?"
3. stimulating recall of prior learning
review definitions of triangles
4. presenting the stimulus
give definition of equilateral triangle
5. providing learning guidance
show example of how to create equilateral

25

9 instructional events (example) (cont'd)

6. eliciting performance
ask students to create 5 different examples
7. providing feedback
check all examples as correct/incorrect
assessing performance
8. assessing performance
Provide scores and remediation
9. enhancing retention and transfer
show pictures of objects and ask students to identify equilaterals

26

When designing instruction...

- Identify the types of learning outcomes
- Each outcome may have prerequisite knowledge or skills that must be identified.
- Identify the internal conditions or processes the learner must have to achieve the outcomes.
- Identify the external conditions or instruction needed to achieve the outcomes.

27

When designing instruction...

- Specify the learning context.
- Record the characteristics of the learners.
- Select the media for instruction.
- Plan to motivate the learners.
- The instruction is tested with learners in the form of formative evaluation.
- After the instruction has been used, summative evaluation is used to judge the effectiveness of the instruction.

28

Alan Collins, Professor Learning Sciences Inquiry Model

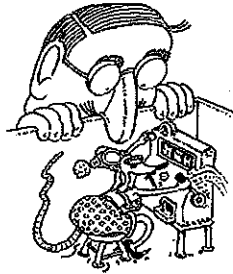


- Collins' Cognitive Theory of Inquiry Teaching is a prescriptive model, primarily Socratic in nature, meaning that it relies upon a dialectic process of discussion, questions and answers that occurs between the learner and instructor. The process is guided in order to reach the predetermined objectives, which are described in this theory as teacher goals and subgoals. Ultimately, the learners will discover "how to learn".

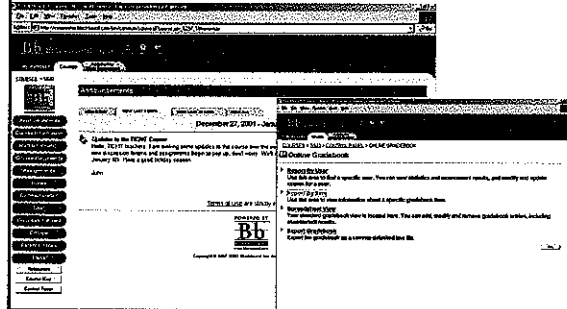
But Finally I Graduated



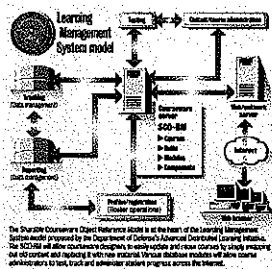
Behaviorist Interactivity



Technology of the late 1990s: Course Management Systems

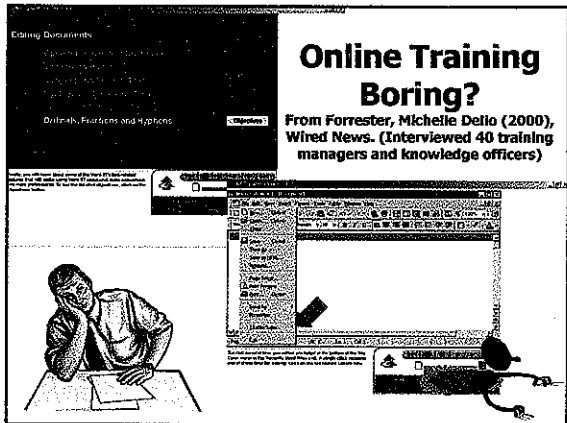


Technology of 2005: Learning "Management" Systems?

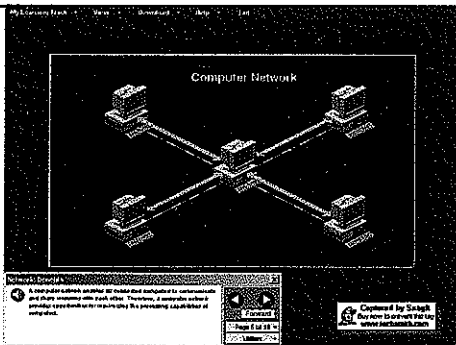


Online Training Boring?

From Forrester, Michelle Dello (2000), Wired News. (Interviewed 40 training managers and knowledge officers)



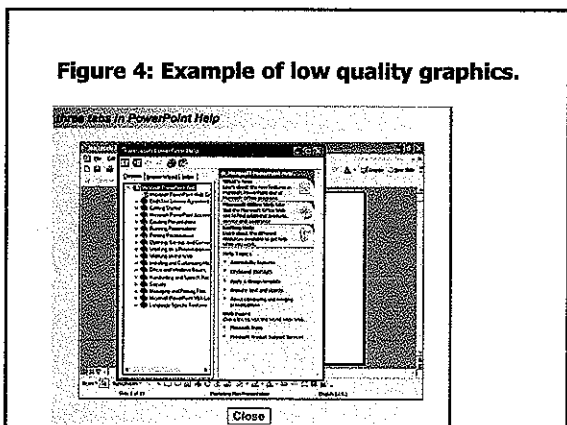
Online PowerPoint?



Example of graphics that do not add to instructional value



Figure 4: Example of low quality graphics.



3

Reflection: What are 3 things you learned so far?

3

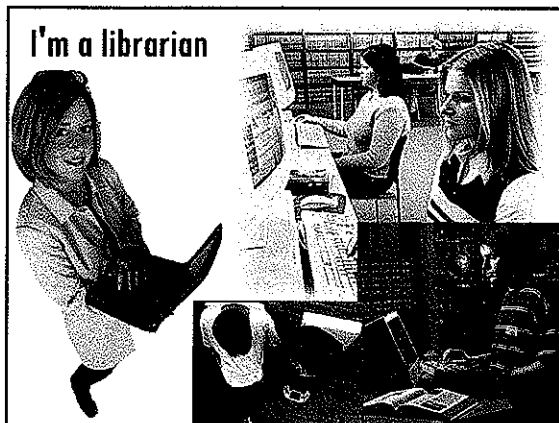
Part 2. E-Learning and ID in the 21st Century



Experience. The difference.



I'm a librarian



Constructivism Emphasizes What?

- Learning not teaching
- Interactive materials
- Learner autonomy, choice, reflection
- Learning is a process and how learn
- The learning context
- Dialogue, discussion, elaboration
- Invention and trying out ideas
- Real world situations, relevance
- The role of experience in learning

Media/Delivery Methods

- Increased options: blended, distributed, flexible learning (delivery determined by learner needs and resources)
- Increased use of Internet; Levels of Web integration
- Organizational aids, scaffolds, and frameworks help
- Benefits of learning objects
- Embed opportunities for self-testing and review



Project-Based Learning (Blumenfeld, Soloway, et al.)

- Pursue nontrivial problems
- Ask and refine questions
- Debate issues
- Make predictions
- Collect and analyze data
- Draw conclusions
- Communicate ideas and findings
- Create artifacts



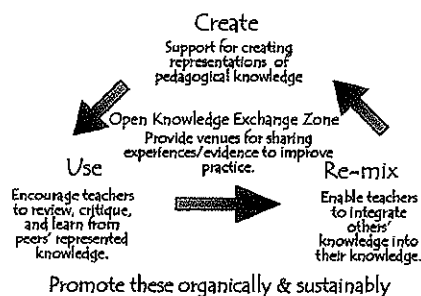
Problem- and Project-Based Learning (PBL)



(Blumenfeld et al., 1991; Savery & Duffy, 1996)

1. Anchor in larger task or problem
2. Develop learner ownership over the problem
3. Design authentic tasks
4. Tasks should reflect real world complexity
5. Learners must own solution path/processes
6. Support and challenge learners
7. Encourage testing against alternative views
8. Encourage reflection on content and process
9. Novelty, Variety, Valued Problems, Choice

A Circle of Knowledge Building and Sharing



Some Quality Benchmarks (ITT Technical Institute)

- Give learners some control over learning
- Develop activities that arouse learner interest
- Create challenging but achievable tasks
- Design activities for knowledge sharing
- Create activities for quality relationships among learners

Some Quality Benchmarks (ITT Technical Institute)

- Give purpose and clear expectations
- Allow learners to ask questions
- Make task relevant and meaningful
- Give clear & constructive feedback
- Provide links to advice from other distance learners

Six Elements of Effective e-Learning Design

(Brown & Voltz, 2005, IRRODL)

1. Activity
2. Scenario
3. Feedback
4. Delivery
5. Context
6. Impact
 - cover issues across all disciplines involved in e-learning design, but particularly focus on learning as the driving motivation

1. Activity

(Brown & Voltz, 2005, IRRODL)

1. Embed tasks that lead to understanding
2. Opportunities for student action rather than predefined tasks
3. Challenges lead to affordances
4. Involve learner in making choices
5. Make task clear and appropriate

Livemocha
http://www.livemocha.com/

Livemocha
"A powerful opportunity for people around the world to connect with language partners"
The New York Times

The Social Way to Learn a Language.
Connect with native speakers around the world
Improve at your own pace with free online lessons

10% OFF

Get Started

Discover Livemocha
Livemocha blends self-paced lessons, a vibrant community, and interactive tools to help you talk to the world. Learn More >>

Livemocha Challenge
Are you learning a new language? Take the Livemocha Challenge and test your skills!

2. Scenario

(Brown & Voltz, 2005, IRRODL)

1. Give reason or motivation to undertake activity; make it compelling
2. Provide interesting context— a story, role play, or situation
3. Uses humor, imagination, reward, drama, anticipation
4. Authentic and interesting

Time Revealed Scenario Learning (Wisdom Tools)

Scenario Overview

Scenario Details

Scenario Overview

Scenario Details

3. Feedback

(Brown & Voltz, 2005, IRRODL)

1. Timely and appropriate criticism
2. Reflective responses to questions
3. Shared comments on forums and blogs
4. Monitor progress in real time
5. Multiple avenues for feedback

4. Delivery

(Brown & Voltz, 2005, IRRODL)

1. There is tension between practical costs and access and learning activity requirements (media rich content, timely activities, etc.)
2. Maximize engagement, feedback, and reflection
3. Incorporate student voting or preferences for activities

5. Context

(Brown & Voltz, 2005, IRRODL)

1. Need to consider user profiles as well as technology infrastructure
2. Consider the institutional objectives
3. How does the activity fit within any sequence of learning

6. Influence

(Brown & Voltz, 2005, IRRODL)

1. How might the e-learning materials affect the learner
2. Extent impact people other than the learner; the broader community of the learner (work setting)
3. What is the cost-benefit
4. Impact on self-esteem

On Demand Learning at IBM

(Rex Davenport, TD, May 2005)

- On Demand learning...based on roles in IBM...As an employee progresses through her work, the learning opportunities available to her via her screen change...We are making learning personalized.

Training Magazine, October, 2006

Blended Courses with Work-Based Activities

Collis (2006) Shell Oil

- In this context, authentic work-based activities are learning activities that are anchored in workplace practice and that are focused on developing the participants' ability to solve problems in their everyday professional job roles (Merrill, 2002).

Teaching Online from IUPUI

(collaborative course development where a faculty member works with a team of instructional and technology experts)
http://www.iupui.edu/~idd/online_teaching/1/1_1_1.htm

TEACHING ONLINE

Overview

Welcome to Teaching Online, an online module in the Teaching in Support of Student Success series, developed by the IUPUI Office for Professional Development.

This self-paced and self-directed module will introduce you to concepts, ideas, and challenges you can use when designing and teaching an online course. There are three sections in the module which you can explore in any order. The lecture on online course design applies basic course design principles to the online environment and identifies key components for a rich and effective online course. The e-learning and online resources section offers an overview of an online course and shares tips and techniques for building a learning community and encouraging student participation. The final section presents a variety of online learning activities and apps you can use to enhance your online course.

As a learning note, please discuss this with your colleagues at a colleague at your local center for teaching and learning. Joint faculty efforts are the BEST ONLINE LEARNING AND TEACHING EXPERIENCES.

Let's start by addressing some of the common myths surrounding teaching and learning online.

© 2006 IUPUI Office for Professional Development

**Dr. Emily Hixon, Purdue Calumet,
January 19, 2009**

"When I work with faculty on developing online courses, I typically talk more about instructional alignment and present a triangle with objectives, activities, and assessment at each corner. The simplicity of that model tends to work well for faculty who just want to develop their course and don't want to learn too much about instructional design or educational theory."

**Dr. Charles Graham
BYU, January 19, 2009**

1. Interaction design - human interaction (peers, instructors, etc.) and interaction with the content or system.
2. Typically instructional designers think about creating content - how to design interactions and experiences (web 2.0 technologies).
3. Another trend is the use of open source and free tools and content.

**Dr. Brian Beatty, San Francisco
State University, January 20, 2009
bjbeatty@sfsu.edu**

"What I've used before has been based on Shank (Learning by Doing), Michael Allen (3 M's - Memorable, Motivating, and Meaningful), or Clark and Mayer (Multimedia Principles)."

**Top Five principles for independent e-learning (non-social situations)
Dr. Brian Beatty, San Francisco State
University, January 20, 2009**

1. Follow a formal ISD process - do not think that designing for e-learning is significantly different that designing for any other instructional situation.

**Top Five principles for independent e-learning (non-social situations)
Dr. Brian Beatty, San Francisco State
University, January 20, 2009**

2. Plan for remote collaboration among team members. E-Learning is often used when learners cannot be brought together for training - and it is often the case that the design team cannot be brought together for the entire project. "Distributed team" dynamics may be challenging, especially at the beginning. Reliable, transparent communication among team members is key.

**Top Five principles for independent e-learning (non-social situations)
Dr. Brian Beatty, San Francisco State
University, January 20, 2009**

3. Test design concepts and content early, and test often. When e-learning is released, it may have an audience of thousands or millions - so small mistakes, or unintended misrepresentations may be multiplied in their ill effects. In classroom training, small changes can be made by a good instructor "on the fly" - but the e-learning system cannot make those kinds of changes.

Top Five principles for independent e-learning (non-social situations)

Dr. Brian Beatty, San Francisco State University, January 20, 2009

4. Focus on immediately relevant knowledge and skills, and provide opportunities for application within the e-learning course. "Information-only" courses could be replaced by printable summaries with almost as much impact as an expensive e-learning course.

Top Five principles for independent e-learning (non-social situations)

Dr. Brian Beatty, San Francisco State University, January 20, 2009

5. Give the learner as much control over the pace and sequencing as possible. In most cases, the exact order of instruction important enough to force feed. Giving the learner more control can lead to greater engagement as they decide what to learn next, and the design itself (navigation, flow of information, etc.) will imply a default order which most will follow.

Part 3: Multimedia Learning



A Different Generation??? Multitasking...

"YOUNG AND WIRED," Katherine Seligman, San Francisco Chronicle, Sunday, May 14, 2006



Gloria Kwan listens to her iPod while text messaging a friend who's in class.
Chronicle photo by Mike Kepka

Effects of interactive multimedia in distance learning

Giti Javidi and Ehsan Sheybani, 2004, In Proceedings of the IASTED International Conference WEB-BASED EDUCATION

"The advancement in technology is shaping every aspect of our life, including education. One decade ago, the Internet was not critical to education. However, now, it has become an integral part of learning process. Internet technology is having a dramatic effect on colleges and universities, producing what may be the most challenging period in the history of higher education."

Learner Control: Xer

- Xers expect a range of options, in terms of what they learn and how they learn it. They require autonomy and flexibility for their own learning. They demand a variety of instructional methods from which they can choose to learn, e.g., videotapes, self-paced modules, interactive CDs.
 - "Online gives me something to do when I'm bored with the professor."
 - "I respect myself more as a self-teacher."
- Dziuban, Moskal, & Hartman (2005)

Simulation: Xer

- **Conditioned to expect immediate gratification (they grew up with drive-through fast food, remote controls, automatic teller machines and microwave ovens), and an expectation that learning should be stimulating and fun (Sesame Street). Generation Xers crave stimulation and expect immediate answers and feedback.**

Simulation: Xer

- **Genxers have a rapid-fire information consumption capability. Rushkoff argues that many of the things for which this generation is maligned, such as short attention spans and lack of ability to concentrate on a single task at once are not problems but actually brilliant coping mechanisms for a world overloaded with information.**

Animation Research

- **Computer-based instruction shows mixed results for animations (Rieber, 1990).**
- **Dynamic visual displays tend to be more effective than static (Park & Hopkins, 1993).**
- **Animations combined with instructional strategies (advance organizers, adjunct questions, feedback, etc.) showed no diff (Owens, 2002).**

Animation Research

- **Rieber (1990) suggests that animations help with gaining attention, presentation, and practice**
- **Animations help emphasize important information (Hannafin & Peck, 1988)**
- **Attention-getting graphics help make relationships between ideas clear (Levin, Anglin, & Carney, 1987)**

Animation Research

- **Rieber (1990) suggests that animations help with gaining attention, presentation, and practice**
- **Animations help emphasize important information (Hannafin & Peck, 1988)**
- **Attention-getting graphics help make relationships between ideas clear (Levin, Anglin, & Carney, 1987)**
- **Dynamic visual displays tend to be more effective than static (Park & Hopkins, 1993).**

Flow Experience and Positive Affect during Hypermedia Learning

(Konradt, Filip, & Hoffman, 2003)

- **Learners (66 students in a business school) in hypermedia learning environments**
- **Positive moods were associated with higher training success.**
- **Positive affect was associated with total knowledge and content knowledge.**

Learning outcomes in online multimedia and lecture versions of intro computing course (Kekkonen-Moneta & Moneta, 2002)

- Evaluated the effectiveness of Web-based, highly interactive, and multimedia-rich e-learning materials (learning outcomes in the lecture and online versions)
- 400+ college students in Hong Kong
- Both groups achieved comparable factual learning outcomes
- Online students outperformed the lecture students in applied-conceptual learning.

Dual Coding Theory (DCT)

- Dual Coding Theory (DCT), proposed by Paivio in 1972, is a model that is based on Cognitive Information Processing Theory. DCT model assumes that information is processed and stored in memory by two separate, but interconnected systems - one visual, the other verbal. DCT claims that pictures are faster and easier to recall since they are coded in both memory systems and the visual system is continuous and parallel in its organization. Verbal memory, on the other hand, is structured in discrete, sequential units.

Dual Coding Theory

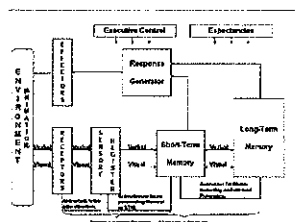


Figure 2. A Model of Multimedia, Dual Coding and Cognitive Processing.
Revised from "The Basic Model of Learning and Memory: Linking Visual to Verbal Processing Theories," by R. H. Glaser and M. F. Dixon, 1998, *Journal of Management Instruction*, 13(1), p. 12

The promise of multimedia learning: Using the same instructional design methods across different media

Richard E. Mayer, *Learning and Instruction*, 13 (2003) 125-139.

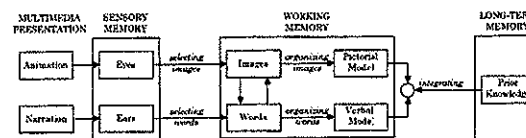


Fig. 1. A cognitive theory of multimedia learning.

Verbal and Visual Systems

- The verbal system specializes in processing and storing linguistic information (words, sentences, etc.). Information is stored in discrete, sequential units. In contrast, the visual system specializes in processing and storing image or 'picture-like' representations.

Cognitive Theory of Multimedia Learning

- Working memory includes independent auditory and visual working memories.
- Each working memory store has a limited capacity.
- Humans have separate systems for representing verbal and non-verbal information.
- Meaningful learning occurs when a learner selects relevant information in each store, organizes the information in each store into a coherent representation, and makes connections between corresponding representations in each store. - Moreno & Mayer (2000)
- Multimedia instruction should be designed in such a way as to minimize cognitive load (Moreno & Mayer, 2003)

Nine Ways to Reduce Cognitive Load in Multimedia Learning

Richard E. Mayer, Roxana Moreno, Educational Psychologist, 2003, Vol. 38, No. 1, Pages 43-52.

- **cognitive load is a central consideration in the design of multimedia instruction.**
- **multimedia instruction should be designed in such a way as to minimize cognitive load**

Multimedia for Active Learning (Mayer, 1997)

- **Active learning occurs when a learner engages in three cognitive processes:**
 1. **Selecting relevant words for verbal processing and selecting relevant images for visual processing**
 2. **Organizing words into a coherent verbal model and organizing images into a coherent visual model**
 3. **Integrating corresponding components of the verbal and visual models**
- **Multimedia can be used to foster these processes.**

Seven Principles for the Use of Animation in Multimedia Instruction (Mayer & Moreno, 2002)

1. **The multimedia principle (present animation and narration rather than narration alone)**
2. **Spatial contiguity principle (present on-screen text near rather than far from corresponding animation)**
3. **Temporal contiguity principle (present corresponding animation and narration simultaneously rather than successively)**

Seven Principles for the Use of Animation in Multimedia Instruction (Mayer & Moreno, 2002)

4. **Coherence principle (exclude extraneous words, sounds, and video)**
5. **Modality principle (present animation and narration rather than animation and on-screen text)**
6. **Redundancy principle (present animation and narration rather than animation, narration, and on-screen text)**
7. **Personalization principle (present words in conversational rather than formal style)**

The promise of multimedia learning: Using the same instructional design methods across different media

Richard E. Mayer, *Learning and Instruction*, 13 (2003) 125-139.

A review of research on the design of multimedia explanations:

- (a) **a multimedia effect: in which students learn more deeply from words and pictures than from words alone—in both book-based and computer-based environments,**
- (b) **a coherence effect: in which students learn more deeply when extraneous material is excluded rather than included—in both book-based and computer-based environments,**

The promise of multimedia learning: using the same instructional design methods across different media

Richard E. Mayer, *Learning and Instruction*, 13 (2003) 125-139.

- (c) **a spatial contiguity effect: in which students learn more deeply when printed words are placed near rather than far from corresponding pictures—in both book-based and computer-based environments, and**
- (d) **a personalization effect: in which students learn more deeply when words are presented in conversational rather than formal style—both in computer-based environments containing spoken words and those using printed words.**

The Multimedia Principle

- **Adding graphics to words improves learning**
 - Use a variety of graphics, including line drawings, charts, and photographs as well as motion graphics such as animation and video
 - Make sure graphics are aligned with the instructional message
- **Research point**
 - An average gain of 89% for learners who studied with text and graphics over learners who studied along

The Contiguity Principle

- **Placing text near graphics improves learning**
 - Refers to alignment of text and graphics on screen
- **Research point**
 - Integrating words and visuals improved retention by 68%

The Modality Principle

- **Explaining graphics with audio improves learning**
 - Audio narration can greatly impact learning achievement
- **Research point**
 - Narrated animations improved learning 80% over animation with text explanations

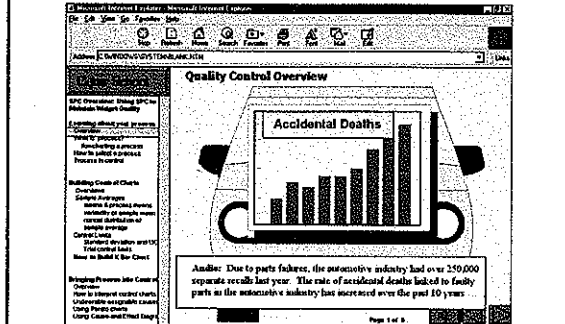
The Redundancy Principle

- **Explaining graphics with audio and redundant text can hurt learning**
 - Narration and reading occur at different rates and split attention
- **Research point**
 - Audio explaining a graphic alone was more effective by 79% than audio explaining a graphic with redundant text

The Coherence Principle

- **Gratuitous visuals, text, and sounds can hurt learning**
 - Simple and focused is better
 - Keep from being pure entertainment or distracting
 - Includes extra text explanation (nice to know information = "seductive details")
- **Research point**
 - A basic lesson saw 105% more learning gains than an enhanced one

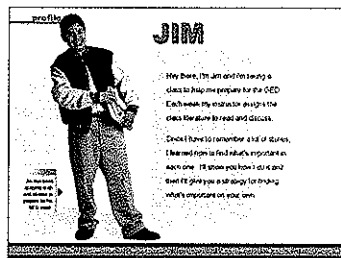
Avoid Seductive Details



The Personalization Principle

- Use conversational tone and pedagogical agents to increase learning
- Research point
 - Programs that use first/second person rather than formal third person are more effective
 - Agents improve learning, and audio can be sufficient. Agents must use informal language for effectiveness

Pedagogical Agent



Key Reasons to Storyboard

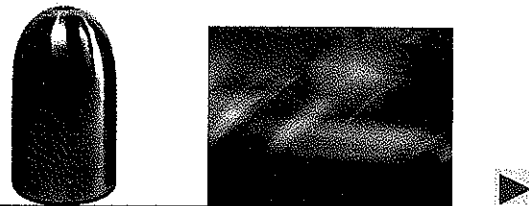
- To facilitate communication within design and development team
- To specify information to developers and programmers
 - Can serve as a contract, facilitate evaluation of delivered product
- To permit early usability testing cycles (e.g. paper prototypes)

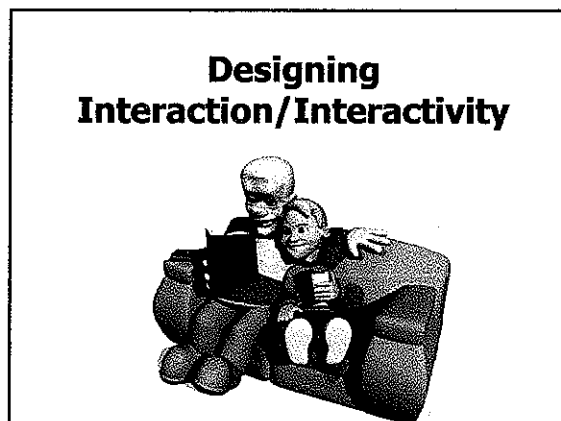
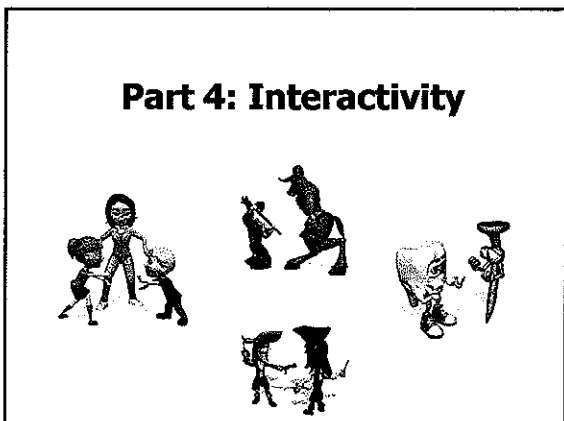
Elements of Storyboard

- Screen content
- Screen layout
- Navigation
- Functions
- Meta data

99 seconds: What have you learned so far?

- Solid and Fuzzy in groups of two to four






What is the Interaction Rationale?

(per Ellen Wagner, April, 2004)

- ✓ **Interaction is the most debated construct in the world of technology mediated learning design and development.**
- ✓ **In these settings, interaction is the defining attribute of the quality and value**
- ✓ **Interactivity (equated with interaction) is the most expensive component of a technology mediated learning design.**




Types of Interactions Possible?

(Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, 3 (2), 1-7.)

1. Learner-Instructor
2. Learner-Learner
3. Learner-Content

- 4a. **Learner-Self:** highlighted the importance of 'self talking', or internal dialogue when engaging with learning materials (Soo & Bonk, 1998)
- 4b. **Learner-Interface:** The learner's ability to use the communication medium facilitating the online course (Hillman, Willis, & Gunawardena, 1994)



Example #1. Flash Visuals and Animations

(e.g., Statistics, Cash Flow, etc.) Univ. of Glamorgan

Example #2. Business Simulations Examples

Example #3. Virtual Tours and Timelines

The image displays four separate screenshots from a virtual tour application. The top-left screenshot shows a street view of a multi-story building. The top-right screenshot shows an interior view of a room with a doorway. The bottom-left screenshot shows a dark, possibly night-time view of a building. The bottom-right screenshot shows a dark, abstract scene, possibly a night view or a specific interior lighting effect.

Example #4. Audio Dramas

eCollege Wales, Univ. of Glamorgan

The screenshot shows a web browser window with the URL <http://www.e-college.wales.co.uk/flash/AudioDrama/AudioDrama1.swf>. The page title is "AUDIO DRAMA". The main content area contains the text: "The Chemical Set - Episode 1. Listen to John and Terry talking about their start-up ideas. What do they need to consider before deciding to pursue their interest in starting a business? Think about their personal as well as their professional situations. Click PLAY to begin." Below the text are four circular control buttons labeled "BACK", "PLAY", "PAUSE", and "STOP".

Example #5. Virtual Psychiatric Interview (Trinity College, Dublin)

SHOWCASES
12

Department: **Psychiatry**
Academics: Prof. Michael Gill, Dr. Brian Fitzmaurice, Kaitie Armstrong

Psychiatric Interviews - The Interview

The screenshot shows a web interface for a virtual psychiatric interview. It features two small video windows side-by-side, each showing a person's face. Below the video windows is a text area with a question: "Q: How does your patient describe their illness?" and a text input field. There are also several buttons and a "GO" button at the bottom.

This is a Virtual Interview project that has been developed by Q.T. and the Department of Psychiatry. The first iteration was launched in March, 2004 for students. In this project students are given the opportunity to carry out a clinical interview with a patient. The student decides what questions are asked and with the aid of video clips can listen and watch the patient's response.

Example #6. Business Classes

(Univ of Glamorgan in Wales & Univ of Calgary)

The screenshot shows a complex software interface for "Eynyx Interactive Financial Accounting". It includes a navigation menu on the left with options like "Board", "Budget", and "Reports". The main area displays a 3D-rendered office scene with a desk, chair, and computer. On the right, there is a text area with a question: "The following information relates to the financial statements of Eynyx Interactive Financial Accounting Ltd. for the year ended 31 December 2008." Below the text is a "CORRECT" button and an "INCORRECT X" button.

Example #7. Video Scenario Learning

(Option 6, Arjuna Multimedia, Bloomington, IN)

The screenshot shows a web interface for video scenario learning. It features a grid of four video thumbnails. The top-left thumbnail shows a person in a white lab coat. The top-right thumbnail shows a person in a white lab coat. The bottom-left thumbnail shows a person in a white lab coat. The bottom-right thumbnail shows a person in a white lab coat. Below the grid is a text area with a question: "What is the most likely cause of the patient's symptoms?" and a text input field. There are also several buttons and a "GO" button at the bottom.

Example #8. Post Model Answers

Lesson 56: Employment Law and Ethics Project

Employment Law and Ethics Project

Question 1

Would it be illegal for Lewis to recommend Billings instead of Lewis? Explain, being specific about the legal doctrines that would apply?

Answer 1

Under both Title VII of the 1964 Civil Rights Act and Section 1981 it is illegal to discriminate on the basis of race or color, and Lewis would likely win a lawsuit using the claim of disparate treatment if he were not recommended for the promotion. If Lewis does not recommend Lewis, she is guilty of violating the law. None of the three primary defenses—seniority, merit, or bona fide occupational qualification—apply to this situation since Lewis has higher seniority, equal skills, and more direct experience with power tools, than does the other candidate Frank Billings.

Title VII "prohibits discrimination based on race, color, religion, sex, and national origin in hiring, firing, job assignments, pay, access to training and apprenticeship programs, and most other employment decisions." ARPCO is a covered entity under Title VII because they are "employing 15 or more employees and engaging in an industry affecting interstate commerce" and as the case footnotes point out "as of November 21, 1991, the Civil Rights Act of 1991 extended protection from discrimination in employment to U.S. citizens working in foreign countries while employed by U.S. firms."

In this case, Title VII's disparate impact is not applicable since ARPCO's policy clearly states to "promote the most

Example #9. Reuse Chat Transcripts

Chat Transcript: 47. Week 9: Chat 4MAT with Bernice McCarthy March 10th from 5-6 pm

Chat Date: 03/10/2008 11:28 PM

Chat Location: 47. Week 9: Chat 4MAT with Bernice McCarthy March 10th from 5-6 pm

Chat Archive: 47. Week 9: Chat 4MAT with Bernice McCarthy March 10th from 5-6 pm

Attachments:

- 01 http://www.km-solutions.biz/.../quiz.zip
- 02 http://www.km-solutions.biz/.../games2train.zip
- 03 http://www.km-solutions.biz/.../thiagi.com
- 04 http://www.km-solutions.biz/.../games2train.zip
- 05 http://www.km-solutions.biz/.../thiagi.com
- 06 http://www.km-solutions.biz/.../games2train.zip
- 07 http://www.km-solutions.biz/.../thiagi.com

Example #10. Online Games

www.km-solutions.biz/caa/quiz.zip
[Games2Train: The Challenge; Thiagi.com](http://www.km-solutions.biz/games2train.zip)

Designing Interaction/Interactivity

- Multiple types of interactions (Moore)
- Learners need templates, models, guides
- Feedback/responsiveness key
- Build teaming & collaboration
- Reflection & dialogue build knowledge
- Build consistency in design of resources
- Outcomes of interaction (Wagner)
- Simulations & games increasingly imp

What are the Design Considerations for Learner Interaction???

(Insung Jung, 2003, Handbook of Distance Education, Moore & Anderson (Eds.))

- Multiple layers of online content & resources
- Increase social presence & interpersonal interaction
- Embed different types of interactions with detailed guidelines and good topics
- Provide quick and frequent feedback
- Include visual layouts where possible
- Allow flexible course structure

Interactivity Online

- Animations in small files (Macromedia (Adobe) Flash)
- Capture desktop activities (Matchware Screencorder)
- Collaborative writing (Writely.com, Jotspot)
- Desktop audio recordings (Audacity; iLife)
- Group Forums (Yahoo! Groups, Google Groups)
- Instant Messaging (AIM, MSN, Yahoo!)
- Noncollaborative writing (Blogger, Pitas)
- Photo Storage (Flickr)
- PP Slides with animation and narration (Articulate)
- VoIP (Skype and Google Talk) voice and text
- Web meetings (Ivisit)
- Wikis (PB Wiki, MediaWiki)



Matrix of Web Interactions

(Cummings, Bonk, & Jacobs, 2002, Internet in Higher Ed)

- Instructor to Student:** Syllabus, notes, feedback.
- to Instructor:** Course resources, syllabi, notes.
- to Practitioner:** Tutorials, articles, news.
- Student to Student:** Comments, sample work, links.
- to Instructor:** Votes, tests, papers, evals.
- to Practitioner:** Web links, resumes, reflections
- Practitioner to Student:** Internships, jobs, e-fieldtrips
- to Instructor:** Opinion surveys, fdbk, listservs
- to Practitioner:** Forums, listservs, prof devel.

Framework for Pedagogical CMC Techniques
(Pausen, 1995, The Online Report on Pedagogical Techniques for CMC; morten@nki.no)

1. **One-alone Techniques:** Online journals, online databases, interviews, online interest groups.
2. **One-to-one Techniques:** Learning contracts, internships, apprenticeships.
3. **One-to-many Techniques:** Lectures, symposiums, skits.
4. **Many-to-many Techniques:** Debates, simulations, games, case studies, discussion groups, brainstorming, Delphi techniques, nominal group process, forums, group projects.



TEC-VARIETY Model for Online Motivation and Retention

1. **Tone/Climate:** Psych Safety, Comfort, Belonging
2. **Encouragement, Feedback:** Responsive, Supports
3. **Curiosity:** Fun, Fantasy, Control
- ...
4. **Variety:** Novelty, Intrigue, Unknowns
5. **Autonomy:** Choice: Flexibility, Opportunities
6. **Relevance:** Meaningful, Authentic, Interesting
7. **Interactive:** Collaborative, Team-Based, Community
8. **Engagement:** Effort, Involvement, Excitement
9. **Tension:** Challenge, Dissonance, Controversy
10. **Yields Products:** Goal Driven, Products, Success, Ownership

Learner-Centered on the Web
(Bonk & Cummings, 1998)

- | | |
|------------------------------|--------------------|
| 1. Safe Lrng Community: | 6, 11 |
| 2. Foster Engagement: | 1- 6, 11. |
| 3. Give Choice: | 8, 9, 12 |
| 4. Facilitate Learning: | 2, 9, 11. |
| 5. Offer Feedback: | 3, 6, 8, 11, 13. |
| 6. Apprentice Learning: | 3, 6, 7-9, 11, 13. |
| 7. Use Recursive Tasks: | 1, 3, 8-9, 10, 13. |
| 8. Use Writing & Reflection: | 3, 8, 12-13. |
| 9. Build On Web Links: | 2-4, 8-9, 12-14. |
| 10. Be Clear & Prompt Help: | 2, 9, 11, 14. |
| 11. Evaluate Dimensionally: | 1-5, 14. |
| 12. Personalize in Future: | 6, 8, 10-13. |

The Web Integration Continuum
(Bonk et al., 2000)

- Level 1: Course Marketing/Syllabi via the Web
- Level 2: Web Resource for Student Exploration
- Level 3: Publish Student-Gen Web Resources
- Level 4: Course Resources on the Web
- Level 5: Repurpose Web Resources for Others
- =====
- Level 6: Web Component is Substantive & Graded
- Level 7: Graded Activities Extend Beyond Class
- Level 8: Entire Web Course for Resident Students
- Level 9: Entire Web Course for Offsite Students
- Level 10: Course within Programmatic Initiative

What can you do synchronously and asynchronously?

- | Synchronous Activities
(Bonk, 2004) | Asynchronous Activities
(Bonk, 2004) |
|---|---|
| 1. Quick Poll or Surveys | 1. Ice Breakers: Eight Nouns Activity and Coffee House Expectations |
| 2. Guest Expert Chats | 2. Web Resource Explorations |
| 3. Online Séance or Role Play | 3. Field Experiences & Internships |
| 4. Team or Group Meetings and Reflections | 4. Case Learning |
| 5. Webinars, Webcasts, or Online Lectures | 5. Critical Friend and Web Buddy |
| 6. Virtual Conference Attendance | 6. Just in Time Teaching |
| 7. Virtual Office Hours | 7. Anonymous Suggestion Box |
| 8. Transcript Archives and Reviews | 8. Online Debates (E-bates) |
| 9. Breakout Room Discussions | 9. Reflective Writing (minute papers, diaries, and blogs) |
| 10. Synchronous Quizzes | 10. Online Galleries of Student Work |

Part 5: One Study of Online Motivation and Interactivity

Dr. KJ Kim, Indiana University
2005

Content Analysis: Results (KJ Kim, August 1, 2005)

	Desktop Applications	Computer Programming	Soft Skills
Duration	6-8 hours		3-4 hours
Course Structure	Concept/skill presentation – examples – practice with feedback		
Avg # of words	29.7 words/page	33.1 words/page	45.7 words/page
Ave # of graphics	1.0 graphic/page	.58 graphic/page	.89 graphic/page
Interactive features	27 activities in 144 pages (0.6 per page)	9 activities in 108 pages (0.1 per page)	14 activities in 100 pages (0.3 per page)
Learner Control	<ul style="list-style-type: none"> • Control of Pace? – Yes • Control of Sequence? – Yes • Being able to ask questions? – Yes & No • Adaptivity? – Yes 		

Reasons for Not Completing the Course (KJ Kim, 2005)

Reason	Frequency	Percent
1. I was too busy.	19	5.2
2. The content was not relevant to me.	14	3.8
3. It was too boring.	14	3.8
4. There were technical difficulties.	9	2.4
5. I got all the information that I needed to get from the course.	9	2.4
6. Other	7	1.9
Total	79	100.0

Learner-Instructor Interaction: Interview Quotes (KJ Kim, August 1, 2005)

- **"The human interaction is very important ... because if you have a question, you raise your hand and you ask. Otherwise, you don't get your questions answered, therefore, it's kind of, you walk away feeling like you didn't learn anything."** (an adult student)
- **"I guess I'm pretty motivated myself, so that wasn't really a factor. I've taken online classes before with instructors, but doing relatively minimal work, and, you know, for me, I was doing that for a pretty specific purpose, you know, to figure out how to do a certain skill or skills. So, you know, I didn't see that being a problem."** (a working adult)

Integration/Application of Content

- **Hands-on Experience (Animations)**
"The thing I liked about the course was the fact that they had actual parts of the program in it. So I could actually find out how it worked. I thought it was good. I thought it was good that they went through and used the actual program."
- **Application of Knowledge (Simulations)**
"The simulations were also very good. The, they're very rich in where you like if you can have a conversational simulation with someone and actually sort of an intelligent conversation. And I really, it's kind of like game playing - it was fun for me to try to guess what was a more appropriate response."

Other Psychological Influences

- **Positive climate**
 - Learning at the comfort of home
 - No pressure for deadlines, grades
- **Prior Online Learning Experience**
 - Prior online learning experience helped them feel less anxious about e-learning.

Interactivity & Continuing Motivation

- **"The convenience is nice, but that's not what keeps it. It makes you want to try it, but it's not what keeps you interested in it. It's got to have more interaction. It doesn't hold my interest as long as what I think it should, and I think if there was some more interactivity of a program, then it would really keep my interest more, and I would be more enthused about taking more courses."**

- An adult student who took a Dreamweaver course

Variables Correlated to the Learner's Continuing Motivation

Variable	r	r ²
Motivational factor; "e-learning is right for me."	.579**	.335
Learner satisfaction	.382**	.149
Motivational factor; "e-learning is NOT for me."	-.255**	.065
Prior experience with online learning	.223**	.050
Motivational factor; "I don't want to be all by myself."	-.204**	.042
Amount of time spent in taking the e-learning course	.105*	.011

* p < .05. ** p < .01.

Implications of the Findings

- This study found out that the learner's motivational change was significantly associated with:
 - Motivational factor, "e-learning is right for me."
 - Learner satisfaction
 - Frequency of interaction with instructor or technical support staff
 - Learner's age
 - Learner's educational setting

Implications of the Findings (KJ Kim, 2005)

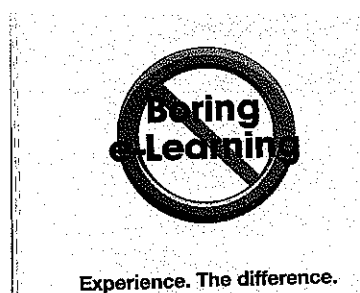
Principles for Designing Self-Directed e-Learning Environments to Sustain or Increase Learner Motivation

1. Provide learners with content that is relevant and useful to them.
2. Include multimedia presentations in the course that simulate the learner's interest.
3. Include learning activities that simulate real-world situations.
4. Provide learners with content that the difficulty level that is just right for them.
5. Provide learners with hands-on activities that engage them in learning.
6. Provide learners with enough feedback on their performance.
7. Design the Web site that is easy to navigate.
8. Design the course in a way that the learner is satisfied with the overall learning experience.
9. Incorporate some social interactions in the learning process (e.g., interaction with instructor, technical support staff, or animated pedagogical agents).

99 Second Stretch Break and Chat!!!



Instructional Design Process



Part VI. The Web 2.0: Podcasts and Wikis and Blogs, Oh My!!!!

Scholars who Blog, Chronicle of Higher Ed, (Glenn Reynolds, instapundit.com; Stephen's Web, www.downes.ca)

Stephen Downes (2004)

"A blog...is and has always been more than the online equivalent of a personal journal. Though consisting of regular (and often dated) updates, the blog adds to the form of the diary by incorporating the best features of hypertext: the capacity to link to new and useful resources. But a blog is also characterized by its reflection of a personal style, and this style may be reflected in either the writing or the selection of links passed along to readers. Blogs are, in their purest form, the core of what has come to be called *personal publishing*. (p. 18)."

Brandon Hall, Chief Learning Officer Magazine, July 2006

"A blog is a Web journal containing dated entries on a given topic or scheme. They can include search, feedback from readers and links to other sites. They can be written by one person or a group. Blogs can be used to share a viewpoint, enable collaborative discussion, present new product ideas, or explain ongoing news or changes."

Blogger Software: You have many choices!

1. Blogger: <http://www.blogger.com/>
2. Diaryland: <http://www.diaryland.com/>
3. Live Journal: <http://www.sixapart.com/livejournal/>
4. Movable Type: <http://www.sixapart.com/movabletype/>
5. Pitas: <http://www.pitas.com/>
6. TypePad: <http://www.sixapart.com/typepad/pricing>
7. Xanga: <http://www.xanga.com/>

Trend #2. Wikis

Brandon Hall, Chief Learning Officer Magazine, July 2006

"A wiki is a collection of Web pages that can be easily viewed and modified by anyone, providing a means for sharing learning and collaboration."

Brandon Hall, Chief Learning Officer Magazine, July 2006

"Wikis can be used to create content on-the-fly, as a repository for information and for archiving group learning. Benefits include speed, simplicity and a sense of ownership among participants."

For Teachers New to Wikis

- Wikis are free, online writing spaces.
- Wikis use simple formatting rules, so no HTML understanding required.
- Highly collaborative composing and creativity
- Authors do not claim ownership
- Published online
- Wikis provide a history and anyone can revisit prior versions of text

How use in teaching

1. Provide space for free writing
2. Debate course topics and readings
3. Share resources (websites, conferences, writing, etc.)
4. Maintain group progress journal
5. Require group or class essay
6. Have student revise Wikipedia pages
7. Write a wikibook

What is a wiki?

- Ward Cunningham, in 1995
- The name, wiki, is based on the Hawaiian term *wikiwiki*, meaning "quick"



3. Podcasting, Webcasting, and Coursecasting

(Adam Curry; www.dailysourcecode.com)

THE NEWS OBSERVER
newsobserver.com

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Search | News | Local Web
Home | News | Sports | Lifestyle | Business | Politics | Opinion | Calendar

B City & State
Monday | Tuesday | Wednesday | Thursday | Friday | Saturday

Students download complete lecture
Professors start using new technology to motivate work outside class

AMIE BLYTHE, Staff Writer
College students who decide to sleep according rather than make a mad dash for a morning class might soon find it easier to hear what they missed — work for work.

A small but growing number of professors are turning class lectures into podcasts, free audio computer files that students can download to iPods or other portable MP3 players.

College instructors have posted written materials and slides online for years. It comes naturally, though, that professors have started making the whole shebang — the lecture and subsequent pre-and-lecture — available to their classes at the tip of a computer key.

"The general consensus here at Duke is its going to change higher education, maybe ultimately very dramatically," said Richard Lusk, a professor of the practice of computer science.

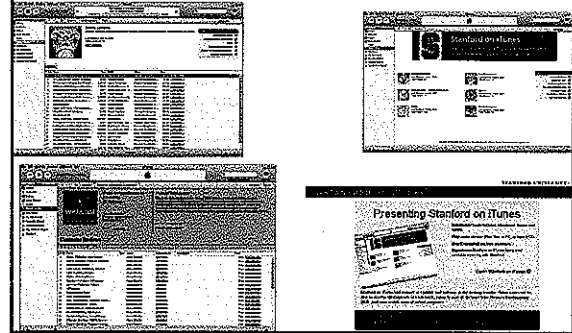
Already at work on a new book, Yang, left, is a frequent staff pick.

Stacy T...
D...
D...

**Brandon Hall, Chief Learning
Officer Magazine, July 2006**

"Podcasts provide a way to distribute an audio or video episode via the Internet for playback at any time on any MP3 device or PC. Podcasts allow training in the form of event capture, new product information, sales tips, orientation, etc. to be delivered on a just-in-time, just-enough basis to anyone anywhere."

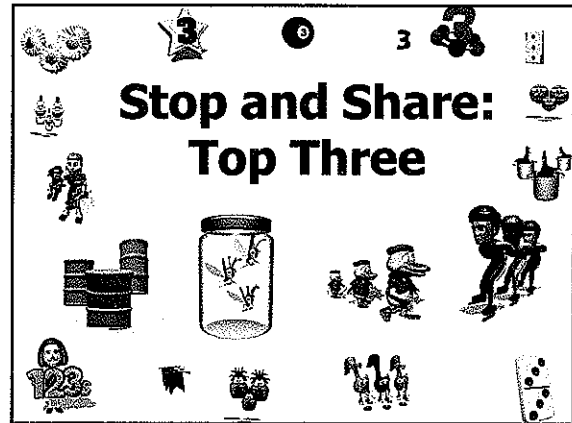
**Podcasting
<http://itunes.stanford.edu/>**



Podcast Guides

- **Short, to the point**
- **Not loaded with URLs and other stuff to write down--put that in the blog**
- **Informal, friendly, conversational**

**Stop and Share:
Top Three**



Any Questions?
Sample Papers and Chapters at
PublicationShare.com
archived Talks at **TrainingShare.com**

