

Learning From Focus Groups: An Examination of Blended Learning

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Abstract

The purpose of this research was to investigate how various distance-learning technologies affect student learning in a high-level course in the military. This training comprised three phases: asynchronous, synchronous, and residential instruction. Initial site visits indicated that this course was extensively planned and supported. At the end of one training course experience, two focus groups of students, as well as three instructors and the course advisor, were interviewed about their on-line experiences. Each group mentioned distinct advantages and disadvantages of the different components of the course. For example, on-line learning appeared to allow for greater and timelier feedback, authentic and meaningful learning, problem-solving, communication, and convenience. At the same time, participants noted several problems including the lack of learning management system flexibility, technology downtime, and overwhelming tool choices and content to learn. They also felt that the time commitments of the program resulted in many students dropping out of the program. Ten key Web-based instruction considerations or issues mentioned across participants related to feedback; meaningfulness of content; content size; course development and organization; the role of the on-line instructor; structuring small groups; flexible and active learning; use of technology; assessment practices; and general skills such as on-line communication, problem-solving, and teamwork. Participants offered many relevant recommendations for fine-tuning this program as well as building similar programs.

Résumé

L'objectif de cette étude était d'étudier comment diverses technologies d'apprentissage à distance influent sur l'apprentissage des étudiants dans un cours de haut niveau dans l'armée. Cette formation comprenait trois phases : asynchrone, synchrone et formation en présentiel. Des visites initiales de sites indiquaient que ce cours était très bien planifié et encadré. Au terme de l'expérience de suivre ce cours de formation, deux groupes de discussion composés d'étudiants ainsi que de trois formateurs et du conseiller pédagogique du cours ont été interviewés sur leur expérience en ligne. Chaque groupe a mentionné des avantages et des désavantages des différentes composantes du cours. Par exemple, l'apprentissage en ligne a semblé faciliter des rétroactions plus importantes et opportunes, un apprentissage authentique et signifiant, la résolution de problèmes, la communication et de la commodité. En même temps, les participants ont noté plusieurs problèmes

incluant le manque de flexibilité du système de gestion de l'apprentissage, les pannes technologiques ainsi qu'un choix trop grand d'outils et des contenus trop lourds. Ils ont aussi exprimé l'opinion que les exigences élevées en temps que demandent le programme ont amené plusieurs étudiants à l'abandonner. Les dix considérations-clés de la formation en ligne mentionnées par les participants touchent la rétroaction, la cohérence du contenu, la taille du contenu, le développement du cours et l'organisation, le rôle du formateur en ligne, l'organisation des petits groupes, l'apprentissage souple et dynamique, l'utilisation de la technologie, les pratiques d'évaluation et les habiletés générales telles que la communication en ligne, la résolution de problèmes et le travail en équipe. Les participants ont fait plusieurs recommandations pertinentes pour améliorer ce programme ainsi que pour construire des programmes similaires.

Introduction

The importance of a highly trained and skilled workforce has never been greater than today. Rising to meet this need is the capability to train personnel anywhere in the world at any time using distributed learning (TRADOC, 1999). Cost and course accessibility are two key factors that fuel distributed learning experimentation and development. In business and industry, projected savings of 30-60% over traditional classroom instruction have placed e-learning in the spotlight (*Fortune Magazine*, 2001). Many questions remain, however, about the return on investment related to e-learning expenditures and investments (Raths, 2001; Worthen, 2001). As distance-learning technology contracts are announced and new policies are enacted, there is a growing need for research on distributed learning courses and programs (Bonk & Wisher, 2000).

Clearly organizations are devoting increasing time and energy to on-line training (Bonk, 2002; *TRAINING Magazine* Staff, 2000; Urdan & Weggen, 2000). Perhaps the fastest growing aspect of this movement is a blended approach that weaves together multiple training approaches and technologies as needed (Ganzel, 2001). In blended learning, instructors might embed Web-based instruction with live instruction, use the Web to supplement live instruction, or combine segments of a Web course that are self-paced with those that require significant instructor presence and guidance (Bonk, 2002; Rowe, 2000). Yet another model would combine opportunities for live Web-based instruction with delayed or asynchronous on-line instruction as well as face-to-face meetings. Research by Kang (1998), for example, revealed that such combined approaches affect student social identity and relationships, team-building, and decision-making, as well as the mentoring, scaffolding, and overall role of the instructor.

The purpose of this research was to understand how a blended or hybrid approach to e-learning affected the professional development of

students in a high-level military course. The study addressed e-learning from the perspectives of the course learners, the course advisor, and the instructors. Focus group discussions helped document distinct advantages and disadvantages from various components of the course. Issues and considerations for e-learning mentioned consistently across groups should help with future course design and delivery methods. In effect, this research may help in forming instructional design principles for the Web as well as in the fine-tuning of this particular program and others similar to it.

On-line Incentives and Motivators

At the heart of many blended learning initiatives is a learner-centered model that provides choice, meaningful activities, project-based learning, and opportunities for student interaction and active learning (American Psychological Association [APA], 1993; Commission on Technology and Adult Learning, 2001). When a learner-centered model is incorporated, the role of the instructor shifts from transmitter of knowledge to that of facilitator or coach. Of course, instructors have myriad roles and responsibilities to coordinate for e-learning success, including pedagogical, social, organizational, and managerial roles (Anderson, Rourke, Garrison, & Archer, 2001; Bonk, Kirkley, Hara, & Dennen, 2001). A delicate and informed balance between these roles is vital to the success of e-learning.

As with any new teaching and learning environment, there are numerous challenges and concerns. One challenge often mentioned in on-line training environments is that of motivating and engaging students in order to boost retention and course completion rates (Phelps, Wells, & Hahn, 1991). Although some claim that tests show better student retention rates for e-learning classes than traditional instruction (Galagan, 2001), a recent survey of 201 corporate trainers and administrators revealed fairly dismal e-learning completion rates across many types and sizes of organizations (Bonk, 2002). Similarly, a study of asynchronous learning using computer-mediated communication in a military training setting showed some cost efficiencies and learning improvements over traditional instruction, but student completion rates were lower, due in part to family and job commitments (Phelps, Wells, Ashworth, & Hahn, 1991). The extent of learning gains and completion rate differences, however, were not consistent across the on-line courses (Phelps, Ashworth, & Hahn, 1991).

In terms of supportive e-learning environments, Moshinskie (2001) noted the success that Motorola experienced when providing human contact and social support to first-time e-learners during the initial weeks of an on-line course. He also suggested using various forms of extrinsic incentives. In a recent survey of 201 corporate trainers and training managers, however, Bonk (2002) found that most organizations did not

offer incentives for the completion of on-line courses. Among those that did, the most common incentive was increased job responsibility. Motivational factors perceived as important in that study included the use of relevant materials, responsive feedback, goal-driven activities, choice and flexibility, fun, interactivity and collaboration, and variety. Specific techniques or activities that these trainers deemed highly engaging and useful included case activities and job reflections, group tasks and teamwork, electronic mentoring, and students leading on-line discussions.

On-line Benefits

Although there may be problems related to on-line learning incentives and motivational tools, many reports continue to focus on employer and employee benefits of on-line training technologies and environments. For example, Urdan and Weggen (2000) point to just-in-time access to information, faster learning, higher retention, substantial cost savings, improved interactivity and collaboration among students, and the ability to learn anywhere and at any time. Murray and Bloom (2000) provide a more research-referenced list of employee and employer benefits related to e-learning. In terms of employers, they argue that on-line learning technologies can provide (a) cost savings, (b) flexibility in content design and delivery, (c) increased interaction and collaboration, (d) learning that is directly linked to work, (e) decentralized learning, (f) training aligned to current job-related needs, (g) employee motivation to invest time and energy into learning, and (h) enhanced learning retention. In terms of employees, on-line technologies provide (a) more control over learning, (b) focused and relevant learning matched to individual learning needs, (c) valuable skills, (d) improved self-confidence, (e) new competences that enhance job satisfaction, (f) skills that boost job productivity and performance, and (g) mechanisms for recognizing achievement. Naturally, Murray and Bloom discuss many challenges in on-line environments, including: technology limitations; measurement failures; management resistance to change; learner resistance to on-line training; and a lack of time, money, and support. The present research sought to verify and document some of these e-learning opportunities and challenges.

Methodology

Overview and Background Information

At the United States Army Armor School in Fort Knox, Kentucky, the use of collaborative learning environments is taking center stage in all phases of the Armor Captains Career Course (AC3-DL, Wardell & Paschetto, 2000). In part this form of training is meant to be a low-cost alternative to other common training practices. And in part it is intended to offer more

flexibility, choice, interactivity, and tracking than the previous delivery format of using a correspondence course combined with a final two-week residential training program. The purpose of the AC3-DL is to train assistant operations officers at command units such as a battalion as well as captains to command entire companies. The course prepares advanced leadership skills from planning combat missions to handling the supplies, maintenance, and information assets of a complex organization. The targeted population is first lieutenants or captains with four to six years of military service, often in their late 20s or early 30s. In effect AC3-DL provides the necessary knowledge and skills for mid-level management of future armor operations.

The AC3-DL training was conducted in three phases: the first two were on line (asynchronous and synchronous), whereas the third phase was face to face. In June 2001, focus groups were conducted with eight students and three instructors who had been recently involved in the AC3-DL. In addition, the distance learning education advisor for the Armor School, who helped design the program, was interviewed. Most of these interview sessions were approximately one hour in length. The eight students, who were members of the Army National Guard, also completed a series of short questionnaires related to their backgrounds and years of experience with computer technology, the on-line learning environment, and the overall effectiveness of the second phase of training (including workgroup attitudes, satisfaction, efficacy, and interpersonal as well as task cohesion).

First Phase: Asynchronous Learning

The first phase of AC3-DL is the asynchronous component during which students learn basic terms and concepts via the Internet with both computer and instructor feedback. This self-paced stage, designed to be equivalent to a three-hour course, contains animation, interactive audio and video, and historical tracking of learner progress through each module. The content was estimated to be equal to about 240 hours of instruction, with an instructor moderating and providing feedback on student progress. Delivery of this instruction was intended to take approximately one year, although highly motivated students can complete it in less time.

Each lesson has a set of objectives consisting of actions, conditions, and standards. To determine how students are meeting these objectives, they are tested before and after each lesson as well as at the end of a complete volume of lessons. The lesson tests are multiple-choice and graded by the computer. End-of-volume questions are embedded in longer "gate" tests that include both computer-scored multiple-choice tests and instructor-graded problem-solving scenarios about mission statements and alternative courses of action. A student must earn 70% or higher on each part of a gate test before the instructor will pass him through to the next volume or

module. Students can retake end-of-volume tests until they obtain the needed scores. With the historical tracking of the learning management system, instructors can identify the modules and components in particular modules wherein students are experiencing the most difficulty, as well as the present status of students in the course.

Second Phase: Synchronous Learning

In the second phase, or synchronous component, students are placed into small groups or teams with other individuals from across the country while working in the Virtual Tactical Operations Center (VTOC). The VTOC contains seven extensions (or rooms) and a set of software tools developed specifically for this course. One of these seven rooms is the “Main” extension, which opens to six others—three on each side. Every extension has the same tools, which makes it possible for smaller groups to collaborate independently of the main group.

During this phase, the use of collaborative learning environments is the focus. Every student has the following:

1. An avatar or virtual image in the 3-D world, so others can see his “location.”
2. Access to an audioconference with others in the same extension (or room) of the VTOC. This audioconference allows anyone to speak at any time, and everyone else will hear him. The maximum number of participants is 15.
3. Several text chat windows: one for the particular extension they are in, one that is global, and a private chat opened by invitation and shared with only one other person.
4. Access to various specially designed tools for collaboration (shared applications).

As detailed below, there are several other unique collaborative tools available in the VTOC: (a) shared text, (b) shared bookshelf, (c) Mapedit, and (d) 3-D terrain.

The shared-text application is shared HTML forms.¹ Such forms for shared-text application help students to write operations orders, warning orders, and other products that are part of the planning process. The shared bookshelf, in contrast, is used for displaying field manuals or “slide shows” that someone may wish to discuss. The third tool, the Mapedit program,² was developed to create map overlays, emulating plastic sheets on which symbols are drawn that are laid onto a map. And if students want a whiteboard, they simply open a blank overlay (no map background). The fourth tool, the 3-D terrain, is a collaborative environment that does not result in a product, but instead enables students and instruc-

tors to “walk” the terrain and lay an overlay on the ground. Such a tool provides users with a different way to visualize their plans. Participants can click on another person’s avatar and see what that person sees. In this way an instructor can take a group of students on a walk, certain that their view will be the same as his while he makes key points about the terrain.

Using these collaborative tools, students work with each other and the instructor for 10 weekends (or roughly 60 hours of asynchronous and 120 hours of synchronous instruction). In asynchronous mode, they acquire important background knowledge, whereas synchronously they engage in a host of collaborative training exercises that result in a finished, doctrinally sound product. Synchronous collaborations are scheduled in advance and held during weekends. Although asynchronous collaborations can occur through the use of e-mail, synchronous collaboration, as noted above, includes the use of a shared whiteboard for map editing, text chat with voice-over IP (2-way and multipoint), the shared bookshelf, private chat, and the 3D terrain tool. Students also have access to a shared version of Microsoft Word, which includes opportunities for group editing and other collaborative writing activities.

This synchronous phase centers in part on groups of 10-12 students acting as battalion staff officers who work together in building an operations order based on various staff positions that they have been assigned. In these role-play situations, they engage in activities to create, share, and evaluate tactical plans. Such plans might address actions (e.g., critical events and decision points), maneuvers, fire support, mobility, logistics, command and control, and other related items. One activity often used is a mission analysis that includes information and critical reflection on terrain and weather, enemy forces, facts, assumptions, limitations, specific tasks, implied tasks, assets available, additional considerations, and a proposed restated mission. During this real-time training, AC3-DL instructors help students work through their tactical maneuvers and other decision-making activities.

Third Phase: Residential Learning

The third and final phase of AC3-DL takes place at Fort Knox, where the groups meet face to face for the first time. Here they engage in traditional classroom and field exercises. This two-week phase is group-paced instruction that is delivered in class, through simulations both constructive and virtual, and on terrain. In effect, it is a capstone experience wherein students are challenged to apply the skills and competences that they acquired via distance learning (Wardell & Paschetto, 2000). As is apparent, the three phases move from a focus on individual knowledge to small-group collaboration and application skills to collective unit problem-solving and decision-making.

Additional Background Information

Months before the focus group sessions reported here, the DL Education Advisor and key assistants shared background information about the program and the technology during two meetings with the researchers. They revealed that the personnel involved in this project were highly focused on creating student-centered training and that the Army had begun Internet-based courses in 1997. In effect, AC3-DL was promoted as cutting-edge courseware designed and developed for the Internet. Importantly, this new course format, which received national recognition for excellence in distance learning (Wardell & Paschetto, 2000), was based on recent cognitive and instructional design principles.

This courseware has many unique aspects. For example, it was intended to take advantage of the strengths of various delivery mechanisms including e-mail, synchronous chats, virtual worlds, simulations, and so forth. One key component, the learning management system (LMS), was designed to provide useful and timely historical data and visual depictions of the modules that students completed. In this way the progress of students through the asynchronous phase of the program, including testing activities, could be tracked and monitored. Instructor monitoring and evaluation of student progress combined with timely feedback and the ability perhaps to earn college credit was intended to reduce student attrition in the course. For example, instructors were asked to provide e-mail feedback within 24 hours and gate testing feedback in 72 hours. Such involvement and individualized attention naturally requires specific instructor training and support (Sanders & Burnside, 2001).

To foster a learner-centered environment, the content and activities were selected based on real-world situations and authenticity. Furthermore, various media (e.g., audio, video, and animation) were intended to address a variety of student learning styles. As alluded to above, both asynchronous and synchronous training components were selected to address various learning needs. For example, research indicates that although synchronous instruction might facilitate two-way interaction and socioemotional interaction, asynchronous instruction tends to be used for one-way task completion efforts (Chou, 2000).

In this study the asynchronous tools included audio, video, and animation components meant to train complex cognitive skills. To enhance and perhaps complement the emergence of new cognitive skills and attitudes, synchronous tools allowed students to create, display, and share digital overlays and maps as well as communicate with peers and instructors. Early phases of the instruction were designed to foster particular student abilities (e.g., classification, writing, preparation, decision-making, planning, and critique skills), whereas later phases targeted other competences

(e.g., analysis, evaluation, monitoring, and specification skills). To assess these abilities, students received immediate feedback from a series of automated pre-tests, post-tests, and practical exercises. Learner engagement was addressed in part through more random tools (such as those they labeled *firefights*). In an attempt to motivate students further, many activities also had elements of fun, humor, and dissonance embedded in them (Reeve, 1996). Clearly, in all phases, the focus was on assisting the learner to complete the AC3-DL course.

Earlier Research

In earlier research (Sanders & Guyer, 2001), both students and unit leaders were fairly positive about the AC3-DL program and noted that it was an improvement over the earlier paper-based correspondence modes of delivery. Student attitudes about the benefits of Web-based instruction were generally more favorable than those of unit leaders. Student attitudinal data also revealed problems with the length of some of the course modules. Although one's present employment situation, technical problems with equipment, family responsibilities, and the course format were common asynchronous factors limiting participation, the key factors hindering synchronous course participation included employment, completing unit drill requirements, technology problems with equipment, course time requirements, and lack of compensation. Various recommendations were made in this report concerning technology training, technical support, compensation, supplemental media, and lesson length.

In a second report, Sanders and Burnside (2001) found that students in the new Web course version completed their training in less time than those in the correspondence mode. In addition, student and instructor surveys and interviews about the Web course were generally more positive than those in the paper-based correspondence courses. In fact the study revealed that content was covered in the Web version of the course that was not formerly addressed. Small-group instructors indicated that students trained via the Web were more likely to make decisions and develop a greater sense of team identity than the correspondence students. In addition, Web students expressed greater planning skills, confidence in front of their peers, tactical proficiency, and general leadership and supervisory skills. Nevertheless, some students complained, once again, about the length of some of the AC3-DL modules and training components as well as several problems with some of the technologies used in the program.

In an examination of the communication patterns during the synchronous phase of the course, Orvis, Wisher, Bonk, and Olson (2002) analyzed 6,601 instances of chat between learners. Interestingly, 30% of the chats were social in nature, whereas the other chat instances concerned

technical problems with equipment (15%) and task related chats (55%), including many examples of collaborative problem-solving.

Results

In this study the purpose of the focus groups was to gain a better understanding of the distance-learning experience from both the instructors' and students' perspectives. Before focus group discussion, the students completed a series of questionnaires to assess their computer and Internet backgrounds, their perceptions of the effectiveness of on-line learning versus classroom learning, their attitudes toward working in groups, their satisfaction and self-efficacy for the second phase of the course, and their perceptions of interpersonal cohesiveness as well as task cohesiveness as it related to their specific group activities.

Student Questionnaires and Other Assessments

Although somewhat few in number, these students had vital perspectives and experiences because they had devoted several hundred hours to the distance-learning format of instruction, many times that of the typical semester-length course. Important to an on-line course, all these individuals indicated that they had a personal computer available for their use and had access to the Internet at both their home and work settings. Overall, the students favorably evaluated their experiences working in groups on line and were extremely satisfied with the synchronous portion of the course. The students' responses also indicated high levels of both individual efficacy and collective efficacy with the synchronous portion of the course, and high degrees of both interpersonal and task cohesiveness in their teams. In addition, participants tended to indicate that the environment represented an active or social constructivist community (average rating of 5 on a scale of 1, *strongly disagree*, to 7, *strongly agree*).

Although the results of these questionnaire measures revealed a generally positive reaction to the course, a series of questions about the technology used, the role of the instructor, the importance of feedback, and the group environment were developed a priori to facilitate focus group discussion. The results of these structured focus group sessions are detailed below.

Interviews With Student Focus Groups

Course attrition and incentives. Attrition is a pervasive problem in distance-learning courses in higher education settings (Bonk, 2001; Phipps & Merisotis, 1999) as well as in training environments (Bonk, 2002). Consequently, this was an issue addressed in the focus group discussions. During the two focus group sessions, the students were asked if they had

ever considered dropping out and if so, why. Seven of the eight students had never considered dropping out because they needed the course for career progression. Their answers reflected a key difference between military courses and many nonmilitary courses—military students must complete specific courses if they wish to advance. As an indicator of the importance of course completion incentives, the eight AC3-DL students interviewed here were sufficiently motivated by opportunities for career progression.

Learning environment. Learners' perceptions of the overall learning environment certainly influenced their progression through the course. Interestingly, one area where the two focus groups differed involved student perceptions of the group environment in the AC3-DL program. One focus group felt that although they had never met face to face during the synchronous portion of the course, they were truly a team. These students stated that they engaged in small talk and shared personal information while they chatted. Such pedagogical activities enabled them to begin to understand the other group members' personalities, strengths, and weaknesses. In addition, all students felt that allowing different students to take on leadership roles helped them learn to be followers and trust others as well as recognize the unique talents and strengths of others in certain knowledge areas. One student stated that the text chat enhanced the development of his relationship with the group because he had to reflect deeply on what he was going to say before typing, and could do so without interruptions. However, in the second focus group the students stated that they did not feel a sense of camaraderie, but instead felt like "individuals struggling to work together as a team." They indicated that although developing collaborative products enhanced group cohesiveness by creating a common goal, they often felt somewhat detached from the other participants.

Instructor's role. Although there were differences in the perceptions of the overall learning environment, the eight students overwhelmingly viewed the role of the instructor as a facilitator rather than a lecturer (see Coomey & Stephenson, 2001, for differences in these roles). In accordance with the original program design goals, a key role of the on-line instructors was to provide direction and guidance that facilitated learning. Thus feedback from the instructor was considered important. Another popular pedagogical technique was the use of early on-line introductions. And while instructors coordinated the chats, they made a concerted effort to involve everyone in the real-time discussions.

Perceived advantages. Given that most of these individuals have full-time jobs and families, it was not surprising that the primary advantages they mentioned for taking the course on-line versus in a traditional classroom were flexibility and convenience. Along these same lines, the ability

to work at their own pace was deemed vital. In addition, they liked being able to ask questions without feeling embarrassed or self-conscious. Students also appreciated the immediate feedback on their progress and mentoring from instructors. Most participants were not hesitant to contact the instructor via e-mail for such feedback. Whereas in the asynchronous portion of the course there was minimal interaction, the synchronous portion provided consistent feedback and interaction. Some students also appreciated that under special arrangements the course could count toward credit for an advanced university degree. Others mentioned that they learned to work as a team while on line. Still others felt that the on-line environment fostered more active learning and thoughtful comments than could either conventional classroom settings or correspondence courses.

Perceived disadvantages. The participants stated that a key disadvantage of the course involved the length of the asynchronous and synchronous course components, although in different ways. As both the Sanders and Guyer (2001) and Sanders and Burnside (2001) reports revealed, the students felt that the asynchronous portion of AC3-DL was extremely long and filled with too much information. This situation led most of the students to skip nonessential portions of the first phase just to get through it in a timely manner, whereas many of their classmates simply dropped the course. One group added that the tests for each completed section were confusing because they used different formats. And when students did complete a volume or module, they could not proceed without instructor permission, thereby taking away, at least in part, from the "learn anywhere, learn anytime" benefit of on-line learning.

In contrast they claimed that the synchronous portion was too short. Some students, for example, mentioned that this phase did not enable every group member to play a different role. Accordingly, they suggested that additional VTOC sessions would allow all members to experience the Executive Officer and Operations and Training positions. And although they claimed to benefit from this phase of their training, the VTOC tool would at times mysteriously remove students from the chat rooms, thereby causing them to lose valuable training time and disrupting work flow. In addition, the map editing tool tended to freeze some computer systems, and the terrain viewer was not used as much as perhaps was anticipated. When the technology did work, most students disliked using the avatar, which represented their physical presence in the operations areas in the VTOC. Finally, the VTOC was not compatible with the Macintosh computer platform. To alleviate some of these problems, these eight students recommended that the course designers and instructors focus on basic technology shown to function effectively rather than on the latest gadgets

or innovations. As Scott (2001) points out, using a new technology (e.g., voice over the Internet) can be a mistake if it does not add perceived relevance and effectiveness to the course or solve a key problem. At the same time, students reported positive experiences with both e-mail communication and the voice chat tool.

In addition to technological concerns, a few other disadvantages were mentioned. For example, the on-line examinations offered minimal feedback other than test scores. Students also suggested that some of the modules could have been delivered and tested in smaller chunks, thereby focusing on specific accomplishments. It is conceivable that such an approach would have resulted in lower attrition rates.

Overall impressions and suggestions. Overall, the students enjoyed the distance-learning course and deemed the technology excellent. In fact the only person in the focus groups who contemplated dropping out had significant time-related concerns. The students genuinely appreciated the course flexibility as well as the ability to work at their own pace during the first phase. One group claimed that the skills learned during the synchronous training of the second phase readily transferred to the phase of residential instruction. The other group claimed that their on-line learning activities did not transfer because the second phase criteria were at a lower standard than those experienced during the residential phase. They also wanted more realistic document-development activities in the second phase. Not surprisingly, this group felt that the most learning occurred in the residential phase.

Although these particular learners did not consider dropping out, they still felt that the course needed to be slightly restructured to further facilitate learning. Recommendations about such structuring included more lectures and direct instruction before the synchronous portion of the course to provide a stronger knowledge foundation from which to draw. At the same time, participants proposed shortening the asynchronous phase of instruction by having fewer practical exercises, reducing the number of items on gate tests, and placing more attention on the quality of knowledge application rather than the quantity learned. Another suggestion was a pre-orientation session to acquaint students with course expectations and tools, while simultaneously addressing their questions and concerns. Finally, although most of the students argued that this course was best presented on line, all students felt that the face-to-face portion of the course was still vital because that was where it "all came together."

Interviews with Course Instructors

Instructional role and philosophy. Interviews with the course instructors provided further insight into the strengths and weaknesses of teaching this complex Web-based course. First, these on-line instructors did not

view their roles as much different than those of a regular classroom instructor. Although they felt that they served more of a facilitative role, providing students with the means, tools, and guidance to learn effectively, they contended that the two major differences between teaching on line and teaching in a classroom were (a) that they could not see their students, and (b) instead of writing grades on students' assignments, they sent them e-mail feedback. Although two instructors emphasized that they allocated the bulk of their time to course planning, the third said that he spent much more time on administrative aspects of the course. Nonetheless, they all mentioned that a key goal of the program was fostering good decision-makers and problem-solvers who could apply what they learned to real-life exercises.

As a whole, the instructors felt that the three parts of the on-line course fitted well into a small-group instruction model and complemented the Army's sequential "crawl, walk, run" philosophy of learning. Interestingly, two instructors were retired officers who were familiar with this three-part training philosophy. Neither claimed much difficulty with the technology or the instructional methodology. In fact, retired officers familiar with small-group training methods and the overall philosophy of learning espoused here may be the best suited for such an approach.

Instructional techniques. The instructors noted that certain instructional strategies and pedagogical approaches were especially useful in on-line environments to facilitate student learning as well as to encourage participation. Whereas the asynchronous phase involved more directive and one-way instructional techniques aimed at learning basic concepts and information, instructors used more indirect questioning, prompting, and nudging in the synchronous phase. The instructors indicated that they were genuinely interested in student progress throughout the course and that they were there to help students succeed. For example, they sent weekly reminders about assignments, used indirect questioning and prompting to engage and involve students, and attempted to place each person in a leadership position in their groups where possible to boost their confidence.

Instructional tactics such as selecting students to be in charge of activities were intended to boost student participation during the synchronous component. Generally this proved successful. The instructors also found that matching weaker students with strong leaders was beneficial. They noted that this often resulted in the respective groups supporting poor performers on their own.

Assessment was different in the first two phases. In the asynchronous phase, objective forms of measurement (e.g., multiple-choice, matching, etc.) were used. In the synchronous portion of the course, however, grad-

ing became more subjective as instructors evaluated the students' military plans. Consequently, they relied on criterion-scoring checklists and guides to evaluate and grade the student products.

Perceived advantages. There was much praise for the program. One instructor claimed that advantages included the ability to provide specific and detailed feedback on student work, greater learning and application of knowledge by students, and more standardization of course content. The other two instructors stated that a key advantage of the synchronous course sections involved teaching students how work with others on a team to solve a problem. In addition to problem-solving and teamwork, they contended that it enhanced students' communication skills. Given the rise of communications technology and the need for team skills in most work settings, claims that distance technologies have a positive effect on such skills are important. Other advantages mentioned included allowing students to get the most current and updated material, providing students with immediate feedback, and equipping reservists with skills and training equal to that of soldiers on active duty. As expected, they also mentioned that the distance course provided an additional avenue for those who wished to advance their military careers.

Although these instructors did not mention many disadvantages, they did report fairly high attrition rates compared with those in correspondence courses. They sensed that part of the problem was that they lacked mechanisms to control the size of content modules during the asynchronous portion of the course. As a result, these students had to fit a fairly robust and demanding curriculum into their already full lives. Early modules, or volumes, in the asynchronous phase were particularly difficult, according to the instructors.

Overall, the instructors enjoyed teaching the course on line and using the technology. They felt that not only were the students going through the distance-learning course better trained than those taking the course through correspondence, but that the distance-learning course provided the students with general skills such as problem-solving and group communication that were applicable to any position in the Army: skills that they argued could not be gained from the correspondence version of the course. In fact they recommended eliminating all correspondence courses in favor of those offered via distance learning, especially for Army recruiters and commanders spread out across the US. When asked about advice they might offer regarding similar projects, they suggested focusing on tools and methods that foster interaction; providing instant or at least consistent feedback; and using and promoting the ability to post, share, and reflect on student products.

Interview with DL Education Advisor

Two previous meetings with the Distance Learning (DL) Education Advisor for the Armor School indicated that she was pleased with the program and was an avid supporter of it. At the same time, she was interested in additional course evaluation, especially as it might improve student completion rates, help fine-tune course production and system resources, and lead to enhanced on-line Web-based instructional tools and strategies. She emphasized that anyone involved in the development of distance-learning technology must be flexible and adaptable because the technology is changing so rapidly that one cannot just look at where the technology is now, but must also consider where it will be a year from now.

The course supervisor was extremely cognizant of learning theory. Although noting constructivist (Duffy & Cunningham, 1996) and learner-centered principles (APA, 1993) related to flexibility, variety, choice, meaningfulness, performance assessment, and learning in authentic contexts, she also pointed to practical exercises that they attempted to embed in the course to help students learn the content. Although facts were important, she wished to foster student application of the facts. With the purpose of training these students to command companies and other similar duties at battalion and brigade levels, it was imperative to focus on bottom-line command readiness. In effect, student understanding was deemed to grow from use. And although the Internet provided the mechanism for course delivery, she recognized that it was not giving them everything. In effect, the learning environment of the AC3-DL program extended beyond the Web.

Advice. For those who wish to replicate aspects of this program, the course supervisor provided several caveats and tips. For example, she claimed that the distance-learning course needed to be adaptable and flexible to changes in learner needs, content requirements, and available technology. Although one must remain open to new possibilities, there are many risks involved in exploring and selecting a particular technology. Consequently, she argued that leaders must be able simultaneously to evaluate current technologies for student learning needs and those that loom on the horizon.

To help others in comparable roles or who are designing similar programs, she outlined six important considerations in the design of distance-learning courses. First, all courses should involve direct e-mail feedback. Her rationale for this principle was that students need to feel connected both to each other and to the instructor and they also need to have a way to assess their progress. Second, she claimed that courses should have meaningful content that allows students to apply the material directly to

real-life exercises. Third, there should be minimal extraneous content (e.g., extra graphics as well as practice exercises) so as to limit student confusion and course complexity. Her team has found that students will skip optional or peripheral materials if they feel cognitively overwhelmed. Fourth, designers of distance-learning courses should carefully analyze their target audiences in order to determine accurately what they want and need from a course. Fifth, distance-learning courses should offer flexibility, choice, variety, meaningful contexts, and performance opportunities. Many of these principles relate to the learner-centered principles from the American Psychological Association (APA, 1993). According to the DL Education advisor, it is vital to create an active learning environment with a balance between flexibility and learner accountability. Not surprisingly, she readily admitted that the instructor was a key part of that environment. With prompt instructor feedback, students were not isolated in their on-line learning endeavors. Last, designers should limit their visions and not stretch the expectations of technology too far beyond the tools and options that have been proven to work. The DL Education advisor argued that there would always be room for improvement, but that one has to start somewhere.

Perceived disadvantages. The course supervisor also noted several problems with the current system. First, many students wanted print copies of course materials. Given the on-line availability of the course materials, however, she felt that this would amount to a waste of paper. Second, the LMS was not flexible enough for most learners and instructors. For example, as alluded to above, some students voiced concern and frustration that they could not move on to another module if they missed too many items on the gate test. Third, because there was not ubiquitous access to the Internet, some activities and events may not always have been available to students across settings. Fourth, in addition to Internet access, some students wanted access to course materials via CD-ROM. Access to materials in CD format is problematic, however, because the Army would lose much of the ability to track student progress and problems. The course supervisor noted that the Army was interested in knowing whether students truly learned the on-line materials and were obtaining new skills and competences, not just if they could answer test questions. In reflecting on overall program goals and expectations, she admitted that this was primarily an issue of control.

Conclusions

There were many distinct advantages as well as disadvantages related to this distance-learning course. On-line learning appears to allow for greater and timelier feedback, authenticity, meaningful learning, problem-solving, communication, and convenient learning. On the other hand, too

many choices can overwhelm learners, and what may appear to be a flexible system may not be when constrained by technology downtime or lack of system familiarity. Interestingly, although feedback may be made an instructional priority and a success story in one phase of on-line instruction, in another phase it may seem lacking to on-line students. Certainly synchronous events appear to have more opportunity for a sense of peer and instructor responsiveness than asynchronous activities. But instead of focusing solely on how to exploit the benefits of synchronous training, one should also consider how to embed learner collaboration and interaction effectively in asynchronous components of the course. In fact the success of e-learning may hinge on the degree of collaborative learning and interaction during asynchronous training, not the degree to which the material is self-paced. Regardless of the distance-learning technologies employed here, time commitments were a prevalent factor that affects student participation and success rates.

As indicated, a number of Web-based instruction principles or considerations emerged during the interviews and focus group discussions. Not surprisingly, these areas relate to the role of the instructor as the facilitator and organizer of the learning process; the need to embed tasks that require active learning, problem solving, and teamwork; the caution not simply to select technologies because they exist; and the need to think about how assessments may vary based on the phase of learning entered into and the technologies available to assist and assess student learning. Additional principles or topic areas addressed the need for consistent and prompt student feedback, meaningful contexts for student learning, thoughtful structuring of group or team activities, and extensive course planning and organization. Whether these are the primary or sole ingredients of on-line course success remains to be seen.

Many of the 10 considerations and issues reflect a constructivist and learner-centered teaching perspective thought to be important in the use of collaborative technologies. In fact there are several direct links to Bonk and Cummings' (1998) 12 guidelines for learner-centered Web-based instruction, such as providing prompt feedback, giving students choice, and establishing psychologically safe learning communities.

Clearly, for students interested in moving up in their military careers, AC3-DL appears to be a successful and rewarding on-line course experience. It was interesting to discover how novel instructional technologies embedded in AC3-DL activities intersect with new forms of teaching and learning. During the focus group sessions, there was a definite feeling of commitment from all parties involved. What caused such feelings? In effect, all three parties—students, instructors, and administrators—had incentives that were vital to student completion and program success.

Despite several significant obstacles and problems, this team was successful in meeting their goals. They used sound instructional design ideas and principles; built and delivered courseware over the Internet; allowed for geographically dispersed students and instructors to collaborate in real-time as well as in delayed modes; and tracked, monitored, regulated, and provided feedback on student progress. As is evident, there were a multitude of successes here.

Final Comments

The course administrators have already implemented a number of changes to the course sequencing that have enhanced and accelerated student completion. In the newer version of the course, students alternate individual work in the asynchronous courseware with a weekend of collaborative work in the VTOC (i.e., synchronous training). With this new training format, there are now seven weekend VTOC sessions instead of 10. Many of the focus group students we interviewed were actually caught in the transition to the new AC3-DL format. According to the DL Education Advisor, if students keep up with the content, they can now finish the program in 12-16 months; in fact one recent “go-getter” completed it in just nine months.

The AC3-DL team has also begun supporting students with expert mentoring in the VTOC. In such mentoring sessions, the interface is slightly different so that guest experts and other visitors do not need to log in or control complex collaborative tools, but instead meet in a 3D meeting hall that simply relies on text chat and voice conferencing.

There are many avenues for course and tool development as well as student testing and evaluation in military e-learning, as well as in higher education, K-12, and corporate settings. As new developments unfold, it is imperative that researchers, scholars, instructors, administrators, and politicians, who too often are struggling just to stay abreast of developments in their own field, become aware of common findings or themes in e-learning research and teaching efforts across instructional and institutional settings. Our study provided one look at the advantages and disadvantages and the many instructional considerations and issues in a unique on-line learning program. Other studies might explore on-line completion rates, attitudes, and overall learning when one's career is not contingent on course completion.

Notes

¹The “driver” of the shared text application enters text, and chooses what “page” of the text form is visible. Followers are read only. However, followers can contribute to the content via either text chat or voice conference.

²Mapedit allows multiple users to add, delete, and move symbols and lines on the map overlay.

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