EDITORIAL

Reports on the use of various technologies to deliver education and training to military personnel appear in the distance education literature: from audio, compressed video, and computer networks to fiber optic transmissions. This issue of DEOSNEWS presents a case study on teletraining using the Joint Military Intelligence College's two-way audio/video electronic classroom. The author outlines ten factors for implementing distance learning in the electronic classroom.

Several recent articles on military training are featured in The American Journal of Distance Education: for example, Cost-effectiveness of Audio Teletraining for the U.S. Army National Guard by Robert A. Wisher and Annette N. Priest (12:1) and The Florida Teletraining Project: Military Training via Two-Way Compressed Video by William J. Bramble and Barbara L. Martin (9:1).

DISTANCE LEARNING QUALITY INDICATORS: TELETRAINING TWO-WAY ELECTRONIC CLASSROOM

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INTRODUCTION

Due to resource constraints and manpower shortfalls within the Department of Defense (DoD), the Defense Intelligence Agency /Joint Military Intelligence College, formerly the Defense Intelligence College (DIC), actively pursued training through technological implementation. In 1990, the Joint Military Intelligence College (JMIC) submitted a proposal to the Office of the Secretary of Defense to acquire funding to develop alternative teaching and delivery methodologies using existing DoD telecommunication systems. The initial funding was approved for fiscal year (FY)1992. At that time, it was noted that interactive video technology has the potential to provide a more efficient and cost effective means for delivering instruction to the Military Commands and Intelligence Service Schools. Department of Defense wide could possibly save on the cost of training by reducing travel and per diem costs for student travel to and from locations around the world. The purpose of this case study research was to identify quality indicators in terms of factors and supporting strategies that contribute to the implementation of distance learning instruction in the two-way audio/video electronic classroom.

THE ELECTRONIC CLASSROOM DELIVERY CAPABILITIES

In June 1994, a formal opening was held for the electronic audio/video (A/V) classroom. Just three months later, a major report was issued by the task force committee on the Joint General Intelligence Training System Subarchitecture. The report concluded that "The present joint intelligence training
structure has insufficient instructor and course development resources to meet projected Unified Command requirements" (p. 2). Therefore, it seemed apparent that the Joint Military Intelligence College's (JMIC) two-way A/V electronic classroom capability was poised to be a force multiplier and a remedy to augment the insufficient instructor and course development resources. Access to traditional resident training courses could be extended by using blocks of distance learning courses with one instructor to simultaneously reach out and teach geographically distant site locations.

The electronic classroom facility is a fiber optic, point multi-point secure network with two-way A/V multimedia capabilities -- video, audio, and computer graphics interface -- with connectivity to the Commands and Intelligence Service School subscribers to the Joint World-wide Intelligence Communications System (JWICS) network. Though the JWICS is classified a network, one that is secure and classified as top secret, it can offer non-classified training only to subscribers. The network's two-way communication permits student interactivity with the instructor and among themselves simultaneously at geographically dispersed locations around the globe. Since the JWICS network is voice activated, the one expert instructor has the capability to interact concurrently with groups of classes and students at the different locations. The voice activated network permits the rotation of the television monitor view to the site(s) where a particular student is speaking. The rotational monitor feature permits the sharing of ideas among all the sites; it gives students a chance to see, talk to and hear each other.

Since the implementation of distance teaching at The Joint Military Intelligence Training Center (JMITC) in fiscal year 1995, the program offerings have included distance learning instruction that make up the core skill and knowledge competencies for intelligence analysts and technicians. During the first quarter of FY 1995, JMITC executed its distance learning program by offering staff development seminars for prospective faculty who were to teach via the distance learning facility.

During the second through fourth quarters of FY 1995, JMITC offered its first four distance learning course blocks via the JWICS to the Commands and Intelligence Service School. The intelligence training blocks ranged from one hour to four hours of instruction on a monthly basis depending on scheduling constraints and system availability. The first iteration of distance learning instructional content was not reconfigured to accommodate the A/V electronic delivery media. There was no effort made to develop student guides and handouts to support the distance learning instructional delivery. However, during the second iteration of distance learning course blocks, a modified implementation strategy took place with significant modifications to program executions. Faculty, facilitator, and student feedback and evaluations were used as a measurement baseline in the redesign and execution for JMITC's distance learning program during FY 1996.

Protocol guidance was established and the distance learning staff practiced the procedures and prompts during individual sessions using the technologies available in the electronic classroom. Protocol refers to suggested procedures for introducing, engaging, and facilitating interactions and conversations in the electronic classroom. In addition to the interactive communications during the telelecture, students were given information on additional communication opportunities to make contact with the instructor by fax, telephone, and internet and/or Intelink, a secure top secret telecommunications network that allows information exchanges among intelligence users.

BRIEF OVERVIEW OF THE LITERATURE
A number of comprehensive distance learning research studies and extensive literature reviews and analyses (Whittington, 1987; Moore 1990; Schlosser and Anderson 1994; Barry and Runyan, 1995) have focused on the measurement of student achievement over the past three decades, but no studies have identified nor specifically focused on the strategies and supporting techniques that contribute to the implementation of distance learning. Further, no studies have focused on the unique characteristics of instruction, the pedagogy, that influence quality. Whittington (1987) reports that the "primary complaint of the critics is that very little research has been done to identify the unique qualities of television and to determine how to exploit them to improve instruction" (p. 54). Similarly, Comeaux (1995) conducted a major research project using the Cape Fear Educational Partnership Network that delivered two-way A/V distance learning courses to geographically dispersed community college sites and a site at the University of North Carolina-Wilmington, NC. Comeaux's study concluded that "Although we have a wealth of accumulated knowledge and expertise about individuals' communication with each other in real-time, face-to-face interactions, we know considerably less about such interactions in an interactive distance learning network" (p. 354).

DISCUSSION

The case study involved three electronic classroom observations, focus group interviews with electronic classroom participants, and written feedback from one of the three distance learning sites to corroborate the electronic classroom observations and focus group interviews.

Factors/Supporting Strategies

The following ten key factors were identified as findings based on the investigation and results of the case study. The ten key factors outlined here are unique to the DoD training/education environment that this case study examined. However, in some instances, the factors and strategies are perhaps transferable to other distance learning settings in DoD as well as academic, public, private, and federal institutions. These ten factors and strategies provide a core baseline of knowledge to the literature about the implementation and quality operations in the electronic classroom: 1) instructor, 2) site facilitator, 3) electronic classroom staff development and training, 4) interaction, 5) correct operations of the technology, 6) importance of graphics, 7) student guidebook, 8) need for adequate planning time for the instructor, 9) a comprehensive evaluation plan, and 10) access to training.

Instructor. All participants in this study agreed that the instructor is one of the most critical factors in the implementation of distance learning in the electronic classroom. The Focus Group Interview (FGI) students all agreed that the instructor is the key to quality and successful instruction in the electronic classroom. The analysis revealed that the instructor's personal characteristics and mannerism can impact the interactions in the classroom. Further the findings suggest that the instructor needs to develop interactive television skills to learn how to promote interactivity. The participants were all in agreement as they identified the following strategies as important to the implementation and quality of electronic classroom operations:

1) using the electronic classroom technologies to deliver the telelecture -- establishing protocol and working with the distant site facilitator;

2) questioning strategies to promote interaction;
3) designing telelecture content;

4) professionalism, mannerisms, gestures in the electronic classroom; and

5) effective adult learning strategies -- engaging adults into the learning process.

Site Facilitator. All the study's participants agreed that the site facilitator is one of the most important factors in the implementation of distance learning in the electronic classroom. The FGI students felt that the facilitator not only manages the administrative operations in the classroom, but also acts as an "assistant instructor" to facilitate discussions. Administrative operation include opening the classroom and setting the equipment configuration prior to the telecast, monitoring the equipment, adjusting the audio and video for clarity, and maintaining, copying, and distributing student materials. The analysis revealed that the facilitator is the crucial link between the instructor and the students at the distant sites. The facilitator is depended on for troubleshooting of the equipment to ensure operability and to make sure the telelecture starts on time -- two aspects critical to the success of distance learning programs. All study participants felt that these strategies were pertinent in regard to the facilitator's role in the electronic classroom:

1) working with the origination site instructor,

2) troubleshooting the equipment,

3) setting up and coordinating protocol procedures, and

4) administration of the electronic classroom.

Electronic Classroom Staff Development and Training. There was strong consensus among the participants about the importance of training for staff who use the electronic classroom for training purposes, particularly the instructor and the facilitator. The participants agreed and the findings concluded that these strategies were integral aspects for staff development and training:

1) teaching in the electronic classroom,

2) development of interactive television (ITV) skills,

3) preparation for teaching in the electronic classroom,

4) designing and developing content for electronic classroom delivery,

5) contingency planning,

6) strengths of the electronic classroom instructor, and

7) the importance and role of the facilitator.

Interaction. Another finding of this study dealt with the importance and role of interaction in the implementation of distance learning in the electronic classroom. The data revealed that interaction is the value added factor that promotes quality and success. All study participants agreed that interaction
is a significant factor in the learning process. This finding is rather consistent with the distance learning and adult learning literature in the field. In particular, the FGI students agreed that these strategies enhanced interaction and promoted student participation in the electronic classroom:

1) questioning;

2) discussion of war stories and scenarios;

3) student guide, planned activities and supplemental exercises;

4) case studies, puzzles; and

5) reading assignments with probing questions.

Hancock et al. (1984) support this notion of interaction as their research concluded that it is critically important that adult learners participate and be involved in the learning process by being allowed to contribute to the discussion and share their experiences about their own perceptions. Further, Law and Sisson (1985) found that the distance learner can find enjoyment and satisfaction with programs when they are clear, flexible in their structure, and there is ample opportunity for feedback and dialogue. Comeaux (1995) concluded that interaction and involvement were crucially important to the students who participated in her research. She noted that student involvement lessened the psychological distance for students assigned at remote learning sites. In the TRADOC (1994) study, interaction and involvement were thought to be "significant" in improving student performance.

Correct Operations of the Technology. Another key factor is the correct operations of the technology; the technology should be operating correctly and used properly by the instructor and the facilitator. The technology refers to: a) master podium controls, b) elmo graphics display unit and camera, c) voice activated microphones, d) television monitors and Codex conferencing equipment. The Focus Group Interview students in particular felt that the correct operations of the technology are critical to operationalizing distance learning. The analysis revealed that if the technology malfunctions, it inhibits the free flow of information and interrupts the learning process. When the technology is operated correctly it: a) lessens the anxiety among the students and promotes interaction, b) avoids unanticipated problems with the loss of audio and/or video which causes the instructor to switch to contingency plan, and c) promotes a successful learning environment.

All participants agreed that the instructor and the facilitator needed to know how to correctly operate the technology as it lessened the psychological distance and promoted seamless interactions as the instructor moved from one instructional technology tool to another during the course of the telelecture. The participants felt that these strategies were pertinent to quality operations in the electronic classroom:

1) operating procedures for electronic classroom technologies;

2) troubleshooting the equipment prior to telecast -- connecting with the origination site and testing the master podium controls; and

3) contingency planning for technology failure.
Importance of Graphics. Responses from the FGI students supported the notion that graphics included computer generated and hard copy visuals, whiteboard illustrations, and drawings. These graphics are important to the implementation of instruction in the electronic classroom. The participants felt that the graphics displayed using the technology should be clear, large enough to read from the television monitors, and support learning objectives. The analysis supported that notion and found that these strategies were essential in designing graphics and visual aids:

1) designing ITV graphics for the electronic classroom,

2) using drawings and illustrations effectively,

3) supporting learning objectives with graphics, and

4) including graphics in the student guide.

Student Guidebook. The FGI students and the Southern Command (SOUTHCOM) group both were the most vocal about the use of the student guidebook. They felt that the guide was very helpful in supporting the telelecture. The guidebook provided graphics and content outline that highlighted the important subject areas. The analysis revealed that the FGI students found the guidebook was helpful for students to: a) take notes during the lecture for future reference, b) help pace the lesson discussion and focus on the topic under discussion, c) share information back in the workplace with other personnel who might not have had the opportunity to take training, d) use as a reference guide on how to perform a certain task or fulfill a job performance requirement, and e) clarify and summarize the main points at the end of the telelecture. The participants felt that the following strategies were important to designing and developing an interactive student guide:

1) outline of content, topics, or subjects;

2) designing illustrations and drawing to support learning objectives;

3) summarizing important concepts;

4) supplemental activities/exercises; and

5) contingency planning.

Need for Adequate Planning Time for the Instructor. There was similar agreement among all participants in this case study about the difference in the amount of time required to teach in the electronic classroom versus the traditional classroom. This study's participants agreed that the electronic classroom instructor had to prepare the telelecture, develop the student guidebook, develop visual aids and graphics, manipulate the technology, move around the classroom to use a different technology and simultaneously manipulate the master podium control buttons; these procedures and operations take more preparation time when compared to the traditional classroom. The FGI students noticed the number of graphic used in the three-hour course block and indicated that there were approximately 100 graphics displayed during that time, in fact there were 89. The FGI students agreed that these strategies and/or topical areas were vital in helping to ensure adequate planning time for instructors to prepare for electronic classroom teaching:
1) preparing to teach in the electronic classroom;

2) developing a telelecture plan;

3) practice session, using the technology;

4) coordinating with the site facilitator; and

5) preparing the student guide/materials.

A Comprehensive Evaluation Plan. The participants agreed that the distance learning program needed an evaluation plan that takes into consideration the important components of the program. The FGI students and the SOUTHCOM group agreed that the evaluation plan should include the hardware technology, the instructor, the facilitator, and content of the telelecture. They all agreed that the technology should be evaluated to ensure interoperability with all sites on the network and to ensure upgrades to the system. This same group responded that the hardware system be evaluated for "obsoleteness."

Participants felt that the teaching and how well the lesson content is organized and delivered, and how well instructional strategies insure interaction and participation in the learning process should also be evaluated. The FGI students at Navy Marine Corps Intelligence Training Center (NMITC) at Virginia Beach, VA felt that the lesson should be assessed to make sure the content relates to the students' real work duties and experiences. The participants felt that instructors and the facilitator should be evaluated on using the electronic classroom technology applications and on administrative coordinations relative to student guides, references, and handouts needed to support the telelecture.

The analysis revealed that the students were concerned about the design of the electronic classroom; they felt that the appearance, placement of the microphones, seating arrangement, and functionality of the cameras and display equipment are all important features that should be assessed. The participants agreed that the design of the electronic classroom should facilitate natural spontaneity during the teaching and learning process. The participants agreed that the following strategies and/or topical areas warrant evaluation and were important to improving the effectiveness of the electronic classroom program:

1) effectiveness of staff development and training,

2) instructor effectiveness and electronic classroom competence,

3) facilitator effectiveness and electronic classroom competence,

4) electronic classroom technologies, and

5) electronic classroom design.

Access to Training. Access to training refers to: a) the student's ability to get training and subject matter updates that augment resident training, b) getting the needed information to make a determination as to whether or not the training will be beneficial in updating and enhancing current job competencies, and c) available training at no monetary cost to the parent organization.
All participants agreed that electronic classroom training is an excellent vehicle for refresher training. Additionally, they felt that the benefits to the receiving sites -- Commands and Intelligence Service Schools -- were that personnel: a) can get the training at their duty station which is a cost savings/avoidance for the parent organization and b) do not have to travel from their respective duty stations to keep current on job and performance competencies.

The students agreed that it is equally important to market the electronic classroom training to users in order to maximize use of classroom and generate enrollments. They agreed that personnel may be more eager to sign up for the electronic classroom courses if they know well in advance of the training and know what the electronic classroom course is about in relation to their jobs. The classification of the course is important because the classification determines a student's ability to enroll. The FGI students at NMITC and SOUTHCOM group in particular felt that evaluation is critical to improving the electronic classroom program. These participants agreed that the following strategies and/or areas were pertinent to a comprehensive electronic classroom evaluation plan:

1) evaluation of technology/hardware;
2) evaluation of instructor strategies -- use of interactive procedures/protocol, questioning procedures, technology applications and use, coordinations with facilitator, and telelecture content;
3) evaluation of facilitator -- use and troubleshooting technology, administration and logistics, and coordinations with instructor;
4) student guidebooks and materials; and
5) design of electronic classroom, technology and hardware upgrades.

As a result of this case study, the findings revealed ten key factors to be important to the implementation of distance learning in the electronic classroom. Based on participants' perceptions, the analysis further revealed that the learning strategies the instructor used to engage students and promote interaction added to the quality and success of the electronic classroom experiences. Meaningful interaction was seen as a value added factor. Those interactions include interactions with instructor, students at the remote sites, and the technology media that re-enforce course objectives and build on learning concepts. The findings revealed that interaction was inhibited by the technology -- beeping sounds when sites entered or exited the teleconference lecture, shifting of the monitor pictures from site to site, and the break of the picture on the monitor due to transitions in the technology. The audio interruptions and degradation increased students' anxiety and hampered interaction and a spontaneous flow of information among the sites.

All study participants were in agreement that the instructor and facilitator must be trained in interactive television skills, electronic classroom technologies, content and media preparation, and electronic classroom administration in order to ensure quality distance learning operations. The participants felt that preparing to teach in the electronic classroom required more time and energy than the traditional classroom.

Participants agreed that the student guidebook and contingency plans that offer students a variety of learning experiences and avenues to interact were essential to promote quality and success. The
analysis also revealed that the guidebook should contain supplemental learning activities to promote student participation in the learning process and to be used to continue the learning in case the technology failed for a period of time. Participants talked about the value of continuous evaluation to ensure qualified staff, relevancy of course materials, and avoidance of technology "obsoleteness." And finally, a key finding of this study was that the electronic classroom offers a new paradigm shift in the role of the instructor coupled with the distant facilitator in the arrangement of a "team." In the electronic classroom, both the instructor and the facilitator depend on each other for the implementation of the learning, essentially supporting each other and performing their duties in concert to implement distance learning.

CONCLUSION

In the context of this case study, the analysis revealed that the implementation of distance learning in the two-way A/V electronic classroom is dependent upon a core set of factors that are supported by the use of different strategies that "add value" to teaching and learning. The ten factors outlined above perhaps set a benchmark for the implementation of distance learning in the electronic classroom. This case study was beneficial in supporting the literature in the field by specifically defining instructional strategies and quality indicators thought to be important in the implementation of distance learning. Consequently, in some instances, the strategies and supporting techniques may be transferable to other distance learning settings.

REFERENCES


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