Implementation of Distance Learning in the Electronic Classroom

A Case Study

by

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(ABSTRACT)

The purpose of this case study research was to identify the factors and supporting strategies that contribute to the implementation of DL instruction in the two-way audio/video (A/V) electronic classroom (EC). A primary goal of this research was to develop an outline of a DL manual that identifies factors and strategies or subject areas that can be used to: (a) contribute to knowledge in the field of practice, (b) improve practice, and (c) improve the quality and success of DL teaching in the EC. Additionally, this study attempted to ascertain the differences and similarities in perceptions among students, facilitators, and training officers who participated in the EC. A list of recommendations are presented at the end of this study; the first list of recommendations suggest areas for the improvement of practice and to influence the quality and success of DL. The second set of recommendations suggest areas for further study to add to knowledge in the field as well as to improve practice.

The case study was completed employing a qualitative methodology using focus group interviews, observations, and written feedback from EC participants. Focus group 1 (data set I) was conducted using a set of 13 pre-determined questions with a total of eleven participants. The EC observations (data set II) was conducted at the Navy Marine Corps Intelligence Training Center (NMITC), Dam Neck, VA with 5 students in attendance. The second focus group (data set III) was conducted with a set of 15 different pre-determined questions with the same 5 students at the NMITC immediately after the observations in the EC. The FGIs and observations were video and audio taped for further review and analysis. Written information reported from two different distant site locations (same course and telecast) was analyzed, coded, and used as data set IV. This data set further clarified and corroborated data generated in data sets I, II, and III.

This case study identified 10 key factors and supporting strategies pertinent to the implementation of DL in the EC. One of the findings in this study was that the roles of the instructor and the facilitator are interwoven; this arrangement is seen as a two-person "team" by this study's participants because the instructor and facilitator are dependent on each other in order to implement DL and ensure quality operations in the EC. This is a new paradigm shift in the instructor's role when compared with the conventional classroom instructor. In my examination of the literature, I could not find that this collaborative arrangement of a two-person "team" was addressed. Other findings were: (a) the importance of the student guide and supplemental materials that aided EC

interactions and (b) the importance of the EC design as a quality indicator and how it can facilitate a good learning environment.

Based on a synthesis of the data, there was considerable agreement among the users about the factors and strategies used to operationalize DL in the EC.   The facilitators and training officers placed more emphasis on the administrative and return on investment aspects of DL -- cost savings, access to training at duty location -- versus the students who placed more stress on instructional strategies – questioning and interaction techniques -- that worked well for them in the EC and the importance of EC courses helping them to keep up to date with job competencies.

A Dedication: My Family

     This work is dedicated to my husband and daughters for their demonstrations of love and care and for their support during this journey and process: Raymond C. Gant, D.D.S., Miss Raemeka M. Gant (the true brain in the family), and Miss Lela Shari Gant (the high achiever and compassionate one). They really do think I can fly; for them, I can touch the sky. For giving me life, love, motivation, and the will to excel, this work is dedicated to my parents: the late Nathan Peters, Sr. who demonstrated tenacity, will, and determination to excel; he taught me to be the best and to aim high, and Mary Peters who continues to provide the emotional replenishment of strength, will, and faith needed to sustain me. And finally, this work is also dedicated to my brothers and sisters for their love and respect; they have been my "soul mates" through the years, my conscious, and guiding light: Jerome and Hedi (deceased), Edward, Helen Dorothy, Bettye, Linda, Nathan Jr., Raymond, Constance (Chris), James Samuel, and Sabrina.

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CHAPTER 1

The Problem

What are the factors that contribute to the implementation of distance learning and influence the quality of instruction in the two-way audio/video (A/V) electronic classroom (EC)? One leading researcher in distance learning (DL), Nil Whittington (1987), concluded after a comprehensive review of more than 100 published and unpublished documents that one of the critical factors that determines student achievement is "the instruction itself" (p. 54). However, Whittington did not offer an explanation of the particular features or techniques employed in the instructional process that make it a critical factor. In contrast, Pearson (1990) studied key leaders and administrators who represented institutions that were delivering distance learning programs. Pearson's analysis employed a three round Delphi Technique to generate and rank what these experts indicated were the 20 most important critical factors to the success of a distance learning program. The top five factors were: (a) identified need; (b) faculty and teacher support incentives for motivation; (c) resources for program implementation; (d) continuous funds for operations and expenses; and (e) quality of the educational program as determined through evaluation (p. 207).

In a closely related study involving a substantial literature review, Schlosser and Anderson (1994) concluded that "the factors that determine learning are the same for distant students as they are for traditional students." They further concluded that "good

distance teaching pedagogy is not fundamentally different from good traditional teaching

technique" (p. 28). Perhaps, but not surprising then, Schlosser and Anderson saw no need

to identify pedagogy strategies that would be unique to effective DL.

This case study explored those factors that contribute to the implementation of DL

in the two-way audio/video (A/V) interactive electronic classroom (EC). This study

solicited training officers/managers, site facilitators, and student perceptions and

judgments which are useful as a source of data which until now has been minimally

investigated, yet fundamental to forming a more comprehensive synthesis of the problem.

Background of the Problem

Due to resource constraints and manpower shortfalls within the Department of

Defense (DoD), the Defense Intelligence Agency (DIA)/Joint Military Intelligence College

(JMIC), formerly the Defense Intelligence College (DIC), actively pursued training

through technological implementation. In 1990, 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 FY 92.

The Provost of the JMIC, Dr. Robert L. DeGross, issued memorandum U-

2823/DIC-1, May 25, 1990 to: (a) help generate interest and galvanize efforts and (b)

promote DL A/V technology as a cost avoidance and savings mechanism. The

memorandum reads in part:

Interactive video has the potential to provide a more efficient and cost
effective means for conducting instruction at off-site locations. Through
the deletion of travel and per diem costs for student travel to the College or
College faculty to overseas locations, both the using COMMANDS and the
College can realize considerable savings.

For administrative and operational reasons, the JMIC was reorganized. As a
result, in June 1993 the Joint Military Intelligence Training Center (JMITC) was
established as a major intelligence training center under the Directorate for Administration.
The distance learning (DL) technology-based programs, electronic A/V classroom, and
operations moved from the JMIC to the JMITC. The development of the electronic A/V
classroom, a video teletraining (VTT) transmit and receive site via the Joint World-wide
Intelligence Communications System (JWICS), was completed in MAY 1994.

In June 1994, a formal opening was held for the electronic A/V classroom.   Just
three months later, in September 1994, 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 JMIC's 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 by extending access to traditional resident

training courses into blocks of distance learning courses, using one instructor to simultaneously reach out and teach up to eight geographically distant training sites.

The electronic A/V 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 JWICS. Though the JWICS is classified a network, one that is secure and classified as top secret; the network 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 interacts 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; it gives students a chance to see and hear each other.

Since the implementation of DL teaching at the JMITC in fiscal year 1995 (October 1994 - September 1995), the program offerings have included DL instruction that make up the core skill and knowledge competencies for intelligence analysts and technicians. During fiscal year (FY) 1995 first quarter (October 1994 through December 1994), JMITC executed its DL program by offering staff development seminars for prospective faculty who were to teach via JMITC's DL facility.

During the second through fourth quarters of FY 1995 (January - August 1995), JMITC offered its first four DL course blocks via the JWICS to the Commands and Intelligence Service School (Appendix V). The intelligence training blocks ranged from one hour to four hours of instruction on a monthly basis depending on scheduling constraints and JWICS system availability. The first iteration of DL 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 DL instructional delivery.

However, during the second iteration of DL course blocks, a modified implementation strategy took place with significant modifications to program executions. Faculty, facilitator, and student feedback and evaluations from FY 1995 were used as a measurement baseline in the redesign and execution for JMITC's DL program during FY 1996.

Protocol guidance was established and the DL staff practiced the procedures and prompts during individual practice sessions using the technologies available in the electronic classroom. Protocol refers to suggested procedures for introducing, engaging, and facilitating interactions and conversations in the two-way A/V 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. Intelink is a secure top secret

telecommunications network that allows information exchanges among intelligence users.

A number of comprehensive DL research studies and meta-analyses (Chu and

Schramm 1975; 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 DL. 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 DL 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: "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).

<center>Statement of the Problem</center>

The problem question that guided this research case study was: What are the factors and supporting strategies (the instructional plan) that contribute to the implementation of instruction in the two-way A/V electronic classroom (EC)?   The literature failed to specifically address the factors (components essential to operations in the EC) and the supporting instructional strategies that contribute to the implementation of DL; the implementation of instruction refers to those factors and strategies (the instructional plan) used by the instructor to stimulate participation and involvement in the learning process.

<center>Purpose of the Study</center>

The purpose of this study was to identify the factors and supporting strategies used to operationalize instruction in the EC.   Another purpose of the study was to also identify the indicators of quality and success in the EC.   And finally, one of the primary goals of this study was to develop a list of factors that could be used in the development of a DL manual to: (a) establish a baseline of knowledge and (b) to improve practice in the field.

<center>Research Questions</center>

The following research questions guided the data collection:

1. What were the instructional strategies that are perceived by training officers, facilitators, and students to be important in the EC?

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2. How did instructors use protocol to introduce, organize for, and inform students about teaching the EC?

3. How did instructors engage and involve students at the distant sites during the telelecture?

4. What technology and media were used during the instructional process in the EC?

5. How did students perceive the helpfulness of specific strategies used by the instructor(s) in the EC?

Significance of the Study

This case study was designed to expand the knowledge of DL, close the gap in the DL literature, and illuminate those factors and supporting strategies that contribute to the implementation of DL in the EC. Since the two-way A/V electronic classroom is an emerging technology, limited information existed about the instructional process and those strategies that influence the quality of DL instruction.   Of significance, a finding of this study concluded that the operations in the EC require a "team" approach to effectively implement instruction; primarily, the instructor and the facilitator work in concert as a two-person team to implement EC operations. Based on a synthesis of this study's data, the perceptions and opinions of participants showed similar agreement about the factors and strategies that were helpful in the EC.

<center>Definition of Terms</center>

The following terms are defined to clarify meaning and assist in understanding the context in which they may be used in this case study research.

Distance learning (DL) and distance education (DE) -- an instructional delivery approach in which the learner is geographically separated from the transmit location and/or person presenting the instruction.

Distant site -- a remote location geographically separate from the transmission site where the instructor is teaching via television.

Factor -- an component or element pertinent to operations in the EC.

Interactive Audio/Video -- two or more sites geographically separated from each other that can interact with one another via audio and video telecommunications.

Point-to-multipoint -- a tele-lecture broadcast from one location to one or more receiving sites geographically separated from the originating telecast site.

Protocol -- a set of rules and/or procedures for engaging, establishing order, and facilitating/controlling happenings and/or events in the EC.

Quality -- infers distinguishing value, superior characteristics, enhancing measures and techniques that positively affect learning and determine perceptions of successful and satisfactory instruction.

Success/Successful -- favorable and satisfactory outcome or result based on perceptions.

Strategy (ies) -- an instructional plan or format for organizing learning activities.

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Techniques -- instructional activities that support the accomplishment of the strategy.

Tele-lecture -- the lecture portion of the DL telecast.

Assumptions

The following assumptions were made about this study:

1. The participants in the study were representative of the population.

2. All individuals willingly volunteered to participate in the case study and provided honest answers to the focus group interview questions.

Organization of the Study

Chapter 1 frames the problem of this case study. Additionally, this chapter provides the background and contextual setting of the case study.

Chapter 2 reviews and presents an in-depth examination of the literature to identify those factors and strategies that contribute to the implementation of DL. Further, this chapter attempts to pin point those instructional strategies used in DL and in other learning environments that promote quality and success.

Chapter 3 provides a detail description of the methods used for data collection in this case study. This chapter contains a description of the methodology and procedures used to perform this study. The chapter is divided into the following sections: (a) research design, (b) selection criteria, (c) research data and collection procedures, and (d) analysis of data.

Chapter 4 presents the case study findings.   The chapter presents a synthesis of the

data based on perceptions of training officers, facilitators, and students who were

participants in the EC via the JWICS network at JMITC. The chapter is divided into two

primary sections. The first section identifies key factors pertinent to the implementation of

DL in the EC followed by a rationale, associated problems, and potential strategy

solutions to remedy problems in the EC; and section two identifies other factors and

strategies pertinent to the implementation of DL in the EC.

Chapter 5 presents the conclusions and discussion based on the study's findings.

This chapter outlines recommendations that are made to improve practice in the field and

to advise on further research study.

Chapter 2

Review of the Literature

<u>Introduction</u>

In the 1990s, two way audio/video (A/V) distance learning (DL) has emerged as an educational alternative to augment and, sometimes, replace traditional classroom teaching (Barry & Runyan, 1995). The purpose of this literature review was to identify factors and strategies that contribute to instruction in the EC. This literature review focused on instructional learning theory, applied practice, and educational technologies. The primary documents used to identify the plethora of references in DL were the Educational Resources Information Center (ERIC), Dissertation Abstracts, Monographs of the American Center for the Study of Distance Education Research, The American Distance Education Association Conference Proceedings (1980-96), and TELECOM Conference Proceedings (1990-96), ABI/INFORM, ProQuest CD-ROM Retrieval Research, and research journals and books. The database searches yielded over 3,500 abstracts, articles, books, reports, and research studies related to DL published since the early 1960s.

This literature review is framed to establish a baseline knowledge about some of the issues in DL. Further, it is structured to help clarify the contextual setting of DL that surrounds and guides this case study.

Performance: Technology Implications

The debate over the effects and performance differences of DL instruction dates back to the early 1930s (Bittner & Mallory, 1933). The earlier DL technologies included the radio, gramophone record, audiocassettes, telephone; and in later years, television and computer technologies entered the fray (Bittner & Mallory, 1933; Spikins, 1991; Verduin & Clark, 1991).

Chu and Schramm (1975) performed a meta-analysis of 421 studies that comparing instructional television with traditional instruction. Their findings indicate that students at all levels learn as well in almost every subject, but younger students favor television for instruction.

Partin and Atkins (1984) conducted a study to measure the effectiveness of instructional audioteleconferencing, supplemented by an electronic blackboard. They compared two different management courses, collected data through student questionaires and test scores to compare achievement and attitudes of military personnel and DoD managers in the teleteach and traditional classroom delivery. The teleteach course had a higher percentage of A's and B's, 88 percent more compared to 83 percent in the same resident course. They concluded that teleteach instruction and student achievement are comparable and, in some instances, higher than resident instruction.

Whittington's (1987) comparative research analysis of over 100 published and unpublished studies found no overall significant differences in achievement produced with

interactive instructional television. One of the studies examined by Whittington was a

Stanford University study conducted over a three-year period and completed in 1983 that

compared performances of traditional classroom and DL students. This study found that

the "16,652 students taking traditional, on campus instruction scored a mean GPA of 3.40,

while 1,771 students taking live interactive video instruction had a mean GPA of 3.39" (p.

52).

Kekerix and Anderson's (1991) comprehensive review of the effects of electronic

media concluded that "telecommunications-based distance education is as effective as

conventional education" (p. 145). Further, the research studies they reviewed do not seem

to indicate a preference "for one form of media or any combination of media over the

other" (p. 145).

Schlosser and Anderson (1994) performed a meta-analysis of the DL literature

from 1883 through 1993. They examined research studies and achievement results of

traditional classroom students and students who were taught using radio, telecourses, and

interactive live television.   One of these was a 1993 study that compared the effectiveness

of traditional versus distance satellite instruction in three master's degree programs, two

traditional (Georgia Institute of Technology and University of Alabama in Huntsville), and

one DL, the National Technological University (NTU). The study found:

Mean exam scores for all three groups were quite high, more than 90 on a 100-

point scale. However, the NTU (distance) students scored significantly higher on

the exam than the Georgia Tech students. The University of Alabama students' scores fell in the middle (p. 24).

From 1989 through 1994, the U.S. Army Training and Doctrine Command (TRADOC) conducted a study that examined five DL technologies, one of which was video teletraining (VTT) via the two-way A/V EC, to determine training effectiveness of VTT in the Army. Data were collected through surveys, interviews, and observations. Students in both the control and experimental group were held constant in terms of demographic variables -- age, time in the military, level of education, and previous experiences with the VTT technologies.   This study compared traditional classroom instruction with two-way and one-way VTT instruction. The study also compared instruction which was redesigned to VTT standards. The goal of this comparison was to determine whether reconfigured instruction actually made a difference in student performance. Three Army Reserve remote sites received the DL instruction via TRADOC's Teletraining Network (TNET). Each student site had a site coordinator to operate the equipment and handle administrative requirements. The findings concluded that "students receiving traditional face-to-face instruction which had been redesigned for the VTT medium performed significantly better than students receiving traditional instruction unreconfigured" course materials (p. 4).   Further, the findings indicated "students in the two-way redesigned VTT condition taught over a period of seven days

performed as well as students training over the four month weekend training schedule" (p. 4).

This section focused on performance implications and effectiveness of technologies in DL settings compared with traditional classroom settings. From these studies, it is reasonable to suggest that the use of DL technologies in delivering instruction are just as effective as conventional classroom teaching.

<div align="center">Interaction</div>

Interaction is another issue that permeates the literature. Interaction refers to student involvement in the instructional.

In the DL setting, Moore (1989) contends that interaction in the electronic classroom is carried out in three distinct ways: (a) student to content, (b) student to instructor, and (c) student to student (p. 1).

These three type of interactions perhaps support Law and Sissons' (1991) position that the distance learner can find enjoyment and satisfaction with DL "if the program has a clear, negotiable structure and if there are ample opportunities for feedback and dialogue" (p. 44).

May (1993) conducted a qualitative research study using in-depth interviews at Athabasca University to determine the effects of teacher-student separation on collaboration and learner interaction as it relates to women studies. May stated that it "may be incorrect to assume that social interaction is necessarily positive or that it always

enhances learning" (p. 42). Through personal in-depth interviews semi-structured, May interviewed nine women from a variety of backgrounds and personal circumstances. Participation in the study was voluntary; however, May selected women on the basis of prescribed criteria to maximize student diversity. May's study concluded that women involved family, friends, and colleagues in different kinds of learning activity tend to view interaction as extraneous to the course rather than an integral and important feature of the course (p. 46). Her study further concluded that interaction as an instructional issue, strategy, and process may not be the primary concern to women distance learners (p. 39). Further, many of these women preferred solitary work and were concerned about getting on with the business of completing their degrees. Finally, May asserts that in reflecting on the opinions and experiences of the women in her study, she is not completely convinced that interaction is inherently a positive educational goal or strategy that is suitable for all types of learners in the DL environment (p. 47).

Portway and Lane (1994) of the U. S. Distance Learning Association report that interaction may not be necessary for learning to take place (p. 305). Their comparative analysis of DL research studies concluded that students who watched the videotapes with no live, real-time interaction performed just as well and, in some instances, better than students who watched the live broadcast. Portway and Lane concluded, "While interaction has become significant, it may not be the most significant contributing factor to all students learning" (p. 305).

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On the other hand, Comeaux (1995) conducted a three year study of using a qualitative method to ascertain the impacts of communication on the learning process in the interactive electronic classroom (EC).   Comeaux used freshmen-level students enrolled in first-year, college-level, criminal justice courses as subjects.   She performed direct classroom observations, in-depth interviews with instructors, students, and administrative and technical personnel. Each group of subjects had different interview questions that related to the purpose of study. Comeaux's study findings concluded that interaction is an important implementation strategy in the learning process.   Furthermore, Comeaux's (1995) findings concluded that interaction for students who participated in the Cape Fear Community College two-way A/V electronic classroom, interaction appeared to lessen the psychological distance for students at the remote locations.

TRADOC's (1994) four-year study that examined two-way A/V DL concluded that interaction and involvement can play a significant role in improving student performance. This same study recommended that there should be at least 30 percent up to 50 percent of each hour devoted to student activity in the DL setting. Further, there should be 4 to 5 "planned" interactions per each hour of instruction during the VTT telecast.

Getting students actively involved in the learning process seems to promote quality and satisfaction that can possibly lessen the psychological distance in the EC. This

feature about interaction perhaps supports Moore's transactional distance theory that

dialogue can reduce the perception of distance between instructor and students in DL.

<u>An Educational and Philosophical Perspective</u>

This section of the literature review provides an overview of the educational and

philosophical theories that undergrid programs of DL.

<u>Theories and Models of DL</u>

Moore (1983), editor of the *American Journal of Distance Education* and

Director for the Center of Distance Education Research at The Pennsylvania State

University, developed a transactional distance theory, which holds that transactional

distance is a function of two distinct variables -- dialogue and structure. Distance is not

determined by geographical proximity; transactional distance is determined by the level

and frequency of dialogue and structure. Dialogue is two-way communication between

the student and the instructor. This is determined by (a) the format of the instructional

content or subject matter that is studied; (b) the educational philosophy of the instructor;

(c) personalities of the instructor and student; (d) environmental factors; and (e) the

medium of communication. Structure involves the measure of the educational program's

responsiveness to the student's individual needs. This is determined by educational

objectives, teaching strategies, evaluation methods adaptability to the objectives,

strategies, and evaluation methods of the student (p. 157-171).

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Moore's theory purports that instruction can be separated into face-to-face or contiguous study and separate, or noncontiguous study. In essence, the separation of teacher and learner with the supplement of some type of medium is an essential component in the distance learning environment.

Building on Moore's theory, Verduin and Clark (1991) developed a model that includes three basic dimensions: (a) dialogue/support, (b) structure/specialized competence, and (c) general competence/self-directedness. Table 1 summaries the three dimensions of Verduin and Clark's DL model. In essence, this model builds on Moore's concept of dialogue by adding the "support" feature as the purpose of dialogue for the distance learner. Further, in Table 1 that follows on the next page, Verduin and Clark clarifies their model's components that undergird the framework and understanding for teaching strategies and the type of support needed for both field-independent and field-dependent learners.

Table 1: A Model of DL: Three Dimensions

I	II	III
Dialogue/Support	**Structure/Specialized Competence**	**General Competence and Self-directiveness**
• Giving directions	• Structure: the function of the formality of the subject's content. • Competence: refers to the level of mastery • Specialized Competence: refers to a situational attribute (this feature is based on the learners expertise or lack of)	• General Competence: dictates that a learner should be competent in basic skills
√ Is essential to attract and retain field-dependent learners	√ The level of mastery affects how the content should be constructed.	√ Student should be able to learn from a variety of materials, recognize the importance or non-importance of data, and prepare written reports in brief, concise form.
	√ High level of structure is recommended in courses where it takes extended years to develop competence.	√ Learner's autonomy is evident. √ Suitable to field-independent learners

From Verduin and Clark's (1991) model of DL, pp. 121-139.

Verduin and Clark refined and expanded Moore's theory by adding the dimension of support to clarify the DL phenomenon which provides a framework by which learning strategies can relate also to adult education as well as the conventional education. The primary reason for dialogue is to "provide support of one kind or another to the distance learner" (p. 124). The importance of support through dialogue differs for field-independent and field-dependent learners. Field-indepenedent students "may only be concerned with dialogue to the extent that they can get answers to questions about content." The assumption is that these type of students need less support than field-dependent distance learners (p. 125). Field-dependent students "are more likely to use dialogue to receive emotional support for their efforts" (p. 125).

In Verduin and Clark's model, lesson structure is high and competence and dialogue are low. The lesson content design must be well organized if the learners are to succeed because they will not receive immediate feedback if they encounter problems or concerns. Nonetheless, Verduin and Clark (1991) maintain that the "quality of the learning in all cases," to some degree, depends on the subject content under study, the needs of the learners, and prerequisite abilities of the adult students (p. 134). The nature of certain courses such as chemistry and/or math may require a more specialized structure and a higher level of prerequisite competency than course in history or instructional design theory.

Moore's (1983) transactional distance theory and Verduin and Clark's (1991) model perhaps complement each other in identifying the challenges encountered in teaching in the DL environment. The DL features and strategies outlined in this section helps to narrow the focus of this case study in understanding the contextual setting necessary to operationalize DL.

Field Independent/Dependent Learners

Perhaps it is reasonable to expect the DL instructor to understand the differences and needs of both field-independent and field-dependent learners so as to design courses and structure learning strategies suitable for both. In doing so, the instructor can possibly motivate students and enhance the instructional process.

Witkins, Dyk, Faterson, Goodenough, and Karp (1962) study of differences between field-independent and field-dependent learners found that field-independent learners prefer individual or solitary learning situations, self-defined goals, and learning strategies. On the other hand, field-dependent students prefer group learning experiences, externally defined goals, support in the form of reinforcements, and explicit instructions. These learners experience perceptual and intellectual situations differently (p. 35). The student who is more of a field-independent learner tend to handle learning situations in a analytical and reflective way using his ability to overcome the directive influence in the learning environment. However, the student with a more field-dependent way of perceiving tends to experience a situation in a global manner; this type of student is more

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likely to be passive and conform to the directive influence in the learning environment (pp. 57-58).

Chickering (1976) conducted a comparative analysis of Witkins et al. (1962) and 1965 studies on field-dependent and field-independent learners, and he concluded that different types of learning environments and instructional strategies influence the learning outcomes of students (p. 79). He concluded that:

A fundamental difference between field-dependent and field-independent

students lies in their analytic ability . . .to separate a construct from its

surrounding context, and to restructure problem situations so that a

construct can be used in a different way. The field-dependent student, in

comparison to her independent peer, needs stronger triggers if

differentiation is to occur. (p.83)

Chickering supports Witkin et al. earlier findings that effective learning depends upon: (a) a firm match between the characteristics of the learner and the characteristics of the programs and the instructors students encounter, and (b) their field dependence or independence learning characteristics (p. 83-84). Chickering further found that "employing teachers who can distinguish the field-dependent student from the independent one and vary their teaching behavior accordingly" is likely to promote successful and more positive learning experiences. And when teachers do, he found that:

"They can provide sufficient warmth and sufficient structure so that the

field-dependent student can experience the human relationships that are so

important to her and can also have the benefit of authoritative suggestions

geared to her tentative, vague, superficial, or other directed statements of

purpose and interest. (p. 87-88)

The section presented some underlying assumptions about the differences between

field-independent and field-dependent learners.   Of importance to this study, knowledge

of the characteristics of field independent/dependent learners will perhaps help to develop

learning strategies in ways that sustain student motivation, promote interaction, and ensure

a quality learning environment.

Adult Learning Theory and Instructional Design Model

The adult learning theory and the instructional design model presented here helps

to understand the foundational structure for DL instructional strategies.

Cross (1981) suggests that learning and developmental psychology theorists have

played a major role in helping practitioners understand the educational and philosophical

basis for helping students learn. Cross posits that learning theorists have "stimulated

substantial research, and all have something to say that is relevant to adult learning" (p.

153).

Cross' study of adult learning is a "synthesis of existing research and theory" and

her objective was "on the task of conducting a comprehensive survey of the literature,

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looking especially for the implications of research and theory for improving practice" (p. ix). She describes her theory on the characteristics of adult learners (CAL) as a mechanism to "elucidate differences between adults and children as learners and ultimately to suggest how teaching adults should differ from teaching children -- basically the position of andragogy" (p. 234). It is a way of thinking about the growing and developmental stages of humans in the context of particular situations. CAL is a framework for thinking about what and how adults learn. Cross' CAL model has three distinct dimensions: (a) physiological/aging which is related to chronological age that calls for an educational stance that is largely adaptive and adjustive; (b) a sociocultural/life phase dimension of Cross' CAL model focuses on adaptation that emphasize adjustments in the design and delivery of learning experiences (that aid growth and development) around the transition points of the life cycle; and (c) the psychological/developmental stage of Cross' CAL model focus is on promoting practical implications for getting educators to capitalize on the teachable moments presented by the developmental tasks of the life cycle.

Cross' CAL model has underlying implications for structuring curriculum and supporting activities for adult learners. This model lends an understanding to the design of learning strategies appropriate for traditional classroom students as well as non-traditional and DL students. The model can be operationalized by: (a) designing flexible and adaptive learning strategies that allow for personal growth and development and (b)

presenting learning projects that promote practical applications that the learner might have experiences and can transfer concepts to practical work experiences.

Knowles (1985) theory was developed from a model he called andragogy. His teaching principles are based partly on his professional and practical work experiences in the field of adult and continuing education. Knowles asserts that learning is most effective when students engage actively in the learning process. Therefore, the interaction that promotes involvement undergrids Knowles' theoretical framework. Further, Knowles claims that adults enter into an educational process with a greater reservoir of experiences than children. The quality of their experiences are shaped by jobs they have held, social and civic commitments, and personal endeavors. Individualized learning activities give adult students an opportunity to use their wealth of knowledge and experiences.

Knowles' theoretical model supports the notion that adults are ready to learn when they experience a need to know or do something in order to perform effectively on the job or in their personal lives. Adults are motivated to learn after they experience a particular need in life situations. With that need, adults enter the educational activity with a life-centered, task-oriented or problem-centered orientation to learning.

Further, Knowles' model supports creating a reciprocal learning environment by involving students in the diagnostic and planning process. His model also encourages students to evaluate their progress and achievement.

Gagne (1985), who has collaborated on research in the area of learning and instructional design, posits a theoretical model for the "events of instruction" (p. 123). Based on this particular "events of instruction" model, Gagne insists that a theory of instruction should describe the external events of instruction to the outcomes of learning by showing how these events lead to relevant support of internal learning processes. Further, Gagne's instructional theory infer that learning is a cumulative process in which the acquisition of specific instruction, rules and knowledge establish the possibility of transfer of learning to a number of more complex, high-order rules. Cumulative learning can result in the establishment of competencies that make it possible for the individual to solve a great variety of problems (p. 244-258). Gagne's instructional theory advances a rationally based alliance between instructional events, their effects on the learning processes, and the learning outcomes that are exhibited as a result of these processes. Gagne's events of instruction model has implications for DL instructional design in that it gives a rationale and logical sequence for presenting the telelesson content. Further, the events of instruction model supports the organization of course content, linking new knowledge to prior knowledge, to promote transfer of knowledge and skills to different situations.

Table 2 presents Gagne's instructional model that outlines the events of instruction. The table shows the sequence of instructional events that support the possible transfer of learning to similar and/or more complex situations.

Table 2: Gagne's Instructional Model: Events of Instruction

STEPS	SEQUENCE OF INSTRUCTIONAL EVENTS
1	Gain the learner's attention
2	Inform learners of objective
3	Stimulate recall of prior learning
4	Present the stimulus
5	Provide learning guidance
6	Elicit performance
7	Provide feedback
8	Assess performance
9	Enhance retention and transfer

From Robert Gagne (1985), The Conditions of Learning, pp. 123-127.

Gagne's model perhaps support supplemental resources such as instructional tools and/or study guides that encourage and guide practice in the learning environment. The model posits a framework appropriate for designing learning strategies suitable for DL as well as for the traditional classroom.

This section of the literature review presented adult learning and instructional design models. Of significance to this study, these models provide a contextual framework to understand the DL setting.

<u>DL Program Development and Training Centers</u>

This section of the literature review examines specialized programs of three leading training centers that focus on DL training with emphasis on program development, curriculum/course design, technology and management of the DL system in the two-way

A/V electronic classroom. These are: (a) The Teletraining Institute at Oklahoma State University, Stillwater, OK; (b) The Center for Educational Development, College of Human and Community Services, New Mexico State University, Las Cruces, NM; and (c) The National Security Agency (NSA), National Cryptologic School (NCS) Video Teletraining Program, Ft. Meade, MD. The first two programs were selected because they are two of the first professional staff development programs in the U.S. and they both are listed in the American Society for Training and Development (ASTD) Services Directory. The NSA/NCS' program was selected because it is the only Department of Defense program that train military and civilian personnel in distance learning methods.

The Teletraining Institute

The Teletraining Institute is one of the premiere professional development centers for distance education; the Institute is located at Oklahoma State University, Stillwater, OK.   Its mission is to help organizations world-wide accomplish the demands of teaching at a distance.   The Institute identified four cornerstones to building a successful distance learning program: (a) instructor preparation/training; (b) selected technologies; (c) program management and (d) program offerings (p. 7). The Institute's Director, Loran Parker, conducted DL research using the telephone as a medium while at the University of Wisconsin; he identified the most critical elements in instructional design and delivery of DL are humanizing, participation, message style, and feedback (Professional Development Guide, March 1996, pp. 7-9).

Humanizing. Humanizing is the process of creating a learning environment which focuses on the value of the individual and overcomes the distance by generating group rapport and interaction. Humanizing helps to break the ice and get learners acquainted with one another. When the instructor shows genuine concern through humanizing the instruction, it lessens the anxiety in the classroom and promotes quality.

Participation. Participation is the process of providing opportunities for spontaneous interaction to the different sites; participation by students also is a means of getting students involved in the learning process.

Message style. Message style is the presentation of the instructional content in such a way that it is received, understood, and can be recalled. For this to occur, the content should be presented in separate topic or subject area modules, the instructor should use a variety of instructional strategies to help maintain interest, should preview lesson to help engage learners, should reinforce key points by using different strategies, and should use media (computer graphics, visuals, student handouts, student guides) to reinforce lesson concepts.

Feedback. Feedback is the process of giving and receiving information from instructor, students from the distant sites, and the use of media to communicate.   Media is used to send graphics and the instructional content which helps the instructor and the students participate in the communication loop. Feedback is important because it: (a) motivates interaction; (b) corrects misunderstandings and helps clarifies the message

intended; (c) improves the effectiveness of messages from instructor and students; and (d)

acts as an evaluative tool for students (Teletechniques Plus Guidebook and Reference,

1995).

The Center for Educational Development (CED)

The CED in the College of Human and Community Services, New Mexico State

University, Las Cruces, NM. The Center's staff development program was established to

office hands-on training for teleclassroom instructors. The program identifies and

addresses those skills necessary to enhance instruction in a teleclassroom environment.

The CED staff development program is designed to meet DL needs of instructors,

industrial trainers, military trainers, health professions trainers and public school teachers

who teach in the DL environment (Cyrs & Smith, 1990, pp. 3-4).

The CED published its hallmark reference, *Teleclassroom Teaching: A Resource*

Guide (1990), as an outgrowth of its collaborative research efforts using its staff

development program in DL as a study unit (p. 2). The Center's guide is used as a

premiere DL reference for several DL staff development programs to include the

NSA/NCS.

The CED found that the telelecture should follow a progressive approach using the

following components in the delivery of DL lessons: (a) the review of information

presented in the prior lesson, (b) the preview of the current lesson, (c) the presentation of

the subject matter and student involvement, and (d) the summary of the lesson content.

The CED found that the telelecture should be personalized to promote success; instructors should use interactive strategies, such as, questions, student guides, and discussions. Other strategies could include addressing students by name, posting a biographical sketch and picture of the instructor in the study guide, periodic visits to distant site locations, and devising a variety of planned questioning techniques to involve the learners at the different sites (pp. 193-205).

The CED developed a nine step DL planning procedure to prepare and deliver DL instruction: (a) pre-class activity, (b) administrative overview, (c) identification of major and supporting ideas (d) learning objectives, (e) instructional strategies, (f) estimation of time for each learning objective match with specific instructional strategy, (g) television graphics, word pictures and media, (h) an interactive study guide and handouts that support lesson, and (i) an assignment component that list texts, articles, films, videotapes, and other homework activities supportive of lesson concepts (pp. 68-102).

The NSA/NCS Video Teletraining (VTT) Program

The NSA video teletraining (VTT) program under the management of the National Cryptologic School (NCS) located at Ft. Meade, MD is a week-long program called Distant Learning Teaching Methods. This program was established an a DL staff development program for DoD consumers world-wide, military and civilian personnel. The NCS program is first designed for DoD civilian and military administrators and faculty

who teach, manage, and/or facilitate two-way A/V interactive electronic classroom training and education.

The NCS program emphasizes a systematic method for determining solutions for performance deficiencies and lack of skills primarily related to the job.   The program teaches participants the instructional systems development model (ISD) that has five basic components: (a) analysis of jobs, tasks, objectives, content, and audiences; (b) design that involves the planning phase similar to a blueprint; (c) development that focuses on the actual construction of the curricula content, strategies, media use; (d) implementation/revision through pilot sessions to test the curricula content; and (e) evaluation of the instructional delivery, hardware, and student assessment strategies (Section 2-A. Organizing Content).

Further, the program teaches specific instructional strategies in the use of such media as video, graphics, electronic bulletin board drawings, and white board illustrations. By using multiple media in the delivery of instruction, information can be transmitted in ways that are appropriate for different types of learners and learning styles. (Section 1-B., Adult Learning From A Distance). Participants are also taught how to plan in advance questions that use simple words, ask job and/or work focused questions that relate the instructional concepts, and ask how new information contrasts with prior information or methods used on the job or work site (Section 3-A., Classroom Questioning Strategies).

Protocol, a set of pre-planned procedures for engaging and facilitating learning in the EC, is another strategy featured in the NCS training program. Protocol is useful because it helps instructors determine how they want to have the distant sites participate and interact before the telelecture begins. Once the telelecture starts, the instructor sets the pace and clarify expectations (Section 30B. Maximizing Interactions-Protocols).

This section of the literature review described the cornerstones the undergrid DL instruction.

<u>Electronic Classroom Operations</u>

This section of the literature review focuses on research findings and descriptive studies that identify strategies that affect operations in the A/V electronic classroom.

Moore, Burton, and Dodl (1991) conducted a descriptive study of the Department of Education (DOE) Electronic Classroom (EC) Project in Wise County and Henrico County Schools, VA to: (a) ascertain how and by whom the EC was being implemented; (b) identify key variables for summative evaluations; and (c) provide formative evaluation information for project improvement. The sample included thirteen middle schools and high schools.   Schools were selected based on school size, grade levels, location, DL courses taught, and mode of delivery (live or on tape). Each of the school sites was observed by at least two of the investigators and in most cases all three investigators participated. Investigators interviewed school and county officials, EC teachers, production staff and students in groups from two to eight participants.   The teachers and

facilitators were selected because they were the most capable and qualified persons available and had expressed an interest or had free a period at the time the EC was in session (p. 34).

Of significance to this study was the finding about the importance of facilitators who contribute administrative support in the EC. Moore et al. concluded that "facilitators not only manage the day to day operation of the extended classroom, they also set the 'tone' of the class and in this way are critical to student involvement and interest" (p.37). Moore et al. further found that if DL is to flourish in its current design as a live, interactive EC, then it is critically important to have facilitators who are enthusiastic, skilled, and committed. The facilitator is an integral part of the EC operations. This individual must be given high priority as a partner responsible for the DL program (p. 38).

Sebastian, Welch, Egan, Page, Nkabinde & Jones (1993) conducted a research study on the quality of television instruction based on the perceptions of program administrators. The researchers conducted two focus group interviews (FGI) that lasted for one and one-half hours each. Each of the FGIs was recorded on video and audio tapes. Eight program administrators from each of the Utah Education Network systems participated in the first FGI and six participated in the second FGI. In analyzing the data, each investigator independently read both of the focus group transcripts and then two of the investigators coded participants' responses using categories that evolved. The other

investigator examined the data for general themes and patterns. The investigators then

compared the analysis based on the different themes that emerged during the initial

analysis; this data was then used to establish a revised set of categories and codes.

Several meetings were held to discuss the revised list of themes and to further clarify

findings prior to writing the final report.

Sebastian et al. concluded that it was difficult to pin point precisely the quality

elements of television instruction. In some instances, quality was defined as preparing

television course materials, preparation and planning for tele-courses teaching, staff

development/training, and incentives. The authors also found that different kinds of

interaction contributed to the quality of telelecture, such as feedback regarding student

performance, student participation, the use of site facilitators, and use of different kinds of

media.

Foshee and Martin (1994) assessed the feasibility of using two-year community

colleges to offer DL courses for the military via the two-way A/V electronic classroom.

Three Florida community colleges participated in the project. Project personnel were

military instructional assistants, military site coordinators, and community college faculty,

all of whom received VTT and instructional systems design and development (ISD)

training through workshops that varied in length from several hours up to two full days.

Five courses were redesigned for delivery on the U. S. Army Teletraining Network

(TNET). Two hundred and seventy-five subjects were chosen based on military rank.

Approximately 63 percent of the students were E5s or below, 30 percent of the students had duty positions related to the course enrolled, five percent had a civilian occupation related to the course. All four military services were involved in the research project. All subjects were high school graduates or equivalent, 15 percent were at the baccalauratae degree level or beyond and 15 percent of the students had previously taken courses taught via television.

Data were collected using 40 different instruments that included Likert scales, open-ended questions, course performance tests, and student interviews. The data was open coded and entered into a database, SPSS, for analysis. Each of the course's data was quantified using means, standard deviations, sample size and the percent of respondents to determine effectiveness of DL instruction.

Of significance to this study are the factors that were identified to operationalize DL in the two-way A/V DL EC. The authors found that the technology functioned as only a path connecting the instructor to the students. However, the technology was also perceived as a barrier between the instructor and the students. The technology, on occasion, was a distraction which made it difficult for the students to have a personal relationship with the instructor. To overcome the technology barrier, the instructor used humor to personalize the instruction and interactive techniques to get students involved in the learning process (p. 2-8).

Bramble and Martin (1995) conducted research to determine the effectiveness of

using community colleges to provide DL to reserve military personnel over the Army's

TNET two-way A/V DL interaction network. This study's findings concluded that a plan

for staff development is important to implement DL. The training should provide

sufficient training, practice, and technical support to EC personnel. Further, training

should include hands-on practice with the technology (p. 23).   The authors concluded that

military programs of instruction and syllabi must be reconfigured and designed for

interactive television instruction (p. 23).   Bramble and Martin findings concluded that

high enrollments in DL courses can justify the added costs of two-way A/V interactive

training for the military reserve units in geographically dispersed locations.   The authors

found that it is important to design learning strategies that allow students to interact with

the instructor and each other over the network. Further, high quality programs of

instruction are important; therefore, it is essential that courses be developed using

interactive teaching techniques to promote quality.   The authors found that effective

protocols were necessary to realize maximum interactive potential of the technology (p.

23).

From an applied practice point of view to a more academic perspective, DL has

captured attention in other educational corners. Writing in *New Directions for Adult and

Continuing Education*, Law and Sissons (1985) claim that one of the main challenges to

distance education is the instructional design.   They posit that the DL introductory

material must be considered and designed in a way that get students involved early in the learning process (p. 49). Another author writing infer that setting the climate for learning is a challenge and a "useful device for organizing the various learning materials is a workbook or study guide" and this includes activities such as ". . . case studies, or skill-based learning activities; and special readings" (Sisco, 1991, p. 45).   There appears to be similar themes that emerge from both the practice side as well as the academic side. Blending the best from both into a seamless approach is perhaps one way of improving and promoting success in the DL environment.

In summary, the findings in this section of the literature review illuminate EC operational strategies and the importance of a facilitator to EC operations. Of special note, the military studies in this section identified factors and strategies that are particular to that environment which this case study is primarily concerned.

<div align="center">Conclusion</div>

This literature review addressed issues in DL related to student performance using technology media, the importance of interaction in the instructional process, educational and philosophical perspectives, DL training centers for research and staff development, and EC operations. Further, the literature illuminated research findings that shed light on operations unique to the military DL environment.

CHAPTER 3

Method

The purpose of this case study was to identify the factors and supporting strategies that contribute to the implementation of instruction in the two-way audio/video (A/V) electronic classroom (EC).   This chapter describes the research design, the selection of faculty, training officers, facilitators, and focus group participants, course blocks, description of data sets, and data collection and analysis procedures.

Research Design

Background

This case study research design used a qualitative approach, inductive analyses, and descriptive explanations based on the Joint Military Intelligence Training Center's (JMITC) EC program unit at the Defense Intelligence Agency (DIA). The EC concept evolved over a two-year period, 1991-1993. After formalizing the concept of operations, the two-way A/V EC facility was approved and institutionalized as a training program to augment traditional classroom training and education. One of the primary goals of DL from the JMITC is to provide improved access to training for the Unified Commands and Intelligence Service School(s) customers without incurring travel cost and extended personnel training periods away from the duty station.

With access to customers as a primary objective, the JMITC moved ahead with the development of its EC during 1993 and 1994. During fiscal year (FY) 95 (October 1994 -

September 1995), the DL program offerings included blocks of instruction that comprised

core skills and knowledge for intelligence personnel, civilian and military.

Initial Implementation Strategies. During FY 95, JMITC initiated its DL program

by offering faculty and staff development seminars. The in-house staff development

program included the Distance Methods course, a week-long intensive hands on and

practice approach to using the technology, overview of adult learning theory, interactive

techniques for student involvement, and course syllabus redesign. One-on-one

instructional assistance and hands on practice with the equipment was also added to the

staff development program.

Beginning in January and running through August 1995, JMITC offered its first

four core instructional blocks of instruction: Collections Management, Terrorism

Dynamics, Terrorism Overview and Update, and Indications and Warnings. These blocks

of instruction were offered over the JWICS network ranging from two to four hours.

During the first iterations of course blocks from the JMITC, no special effort was

made to revise the course content to the electronic delivery media nor prepare student

guides and handouts. However, based on student feedback and evaluations from FY 95, a

smiliar approach was used with significant modifications to program executions for FY 96.

For the second year of DL offerings, the same core blocks of instruction were

redesigned. The lesson content was designed into units of instruction with interactive

television style graphic aids and visuals. Faculty DL delivery manual and student guides and handouts were designed to supplement the telelecture.

Additionally, protocol guidance was established and practiced during the one-on-one staff development session(s). In addition to the interactive communication during the telelecture, students were given information on supplemental communication opportunities to make contact with the instructor via fax, telephone, and internet and/or intelink. This supplemental access to information allowed students to acquire extra course materials and get one-on-one support from the faculty member.

Since the initial offerings of course blocks during FYs 1995 and 1996, the program went through a transformation of course design and delivery strategies based on the initial feedback and evaluations from FY 95. The program documents, evaluations, and the literature review are sources of evidence that provided a baseline of information about instructional design and delivery strategies pertinent to the operations in the JMITC electronic classroom.

<u>Selection of Faculty, Course Blocks, Training Officers, Facilitators, Focus Group Students</u>

Faculty were selected who: (a) had prior EC staff development, (b) were familiar with the EC technologies, and (c) had prior practice and teaching in the EC. The course selection criteria included: (a) course offered in either FY 95 and FY 96; and (b) reconfigured to DL television format. Training officers, facilitators, and focus groups participant(s) met the following criteria: (a) previous participation in the JWICS EC either

as a manager, facilitator, or student; and (b) availability to participate in the EC focus group interview(s).

Research Data and Collection Procedures

This section outlines the research data and the data collection procedures employed. The methodology descriptions seek to clarify the data collection procedures used to conduct this study.

Baseline Documents. An examination of JMITC's DL program documents from FYs 1995 and 1996 (October 1 through September 30 of each year) was investigated to ascertain faculty, training officers, facilitators, and students' judgments about the program and to help establish a baseline of category domains for this case study research. The following documents were used: (a) program visual aids, (b) the faculty/staff development guide, (c) student evaluations, and (d) facilitator and faculty program notes to the administrator. Additionally, the information from these initial examinations was used to: (a) acquire a better understanding of the EC from the different perspectives; (b) to develop focus group questions; and (c) to develop checklists and matrices used during the focus group interviews and observations in the EC. Historically, one of the primary uses of documentary evidence is to corroborate and supplement evidence from other sources (Merriam, 1988; Patton, 1990; Strauss and Corbin, 1990; Yin, 1994; Stake, 1995).

Focus Group Interview Questions. Based on the initial literature review and the JWICS program document analysis, focus group questions were developed, revised, and

divided into several domains. These domains were: instructional strategies, types of curriculum, staff development, interaction/involvement, distant site facilitation and evaluation. This first set of FGI questions were developed and validated twice during Spring, 1996 with: (a) 10 students as a classroom project in Measurement Theory, EDRE 6624 and (b) 2 NSA/NSC DL videoteletraining administrators.

Data Set I: Focus Group Interview 1. The first focus group interview (FGI) was conducted on April 22, 1997 using the JWICS network and the JMITC EC, Washington, DC. There were 11 participants in attendance: 5 training officers, 2 facilitators, and 4 students. The Indications and Warnings Course session was videotaped for further analysis. The data generated from the literature review and examination of the JMITC program documents were used to more narrowly focus on the EC transactions, strategies, interactions, and user perceptions based on their experiences. The first FGI questions can be found in Appendix I.

Data Set II: Observation in the EC. The second data collection occurred on May 28, 1997 at the Navy Marine Corps Intelligence Training Center (NMITC), Dam Neck, VA. I observed the EC classroom with 5 students in attendance. The Indications and Warnings course was transmitted from the JMITC, DIA, Washington, DC. I used a pre-determined checklist (Appendix II) designed specifically to observe strategies and factors inherent in the EC operations. This included participative strategy, interactions, responses, and the use of technology and media. The purpose of the observation in the

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EC was to gather exploratory information that would illuminate, confirm and/or validate the strategies that were identified in the literature review, in the JMITC program documents, and in the first data set analysis.   The observation in the EC was videotaped for a more thorough review and further analysis.

Data Set III: Focus Group Interview 2. I conducted the second focus group interview immediately after the Indications and Warnings course on MAY 28, 1997 in the EC at the NMITC with the same 5 students who were students in the EC during the DL Indications and Warnings course. Based on the data sets generated previously, I developed and used a different set of pre-determined questions (Appendix III) for this data collection procedure. This new set of FGI questions focused on the issues, strategies, and findings illuminated in the previous data sets. This second focus group interview was also videotaped for a more in-depth examination and analysis.

Data Set IV: Distant Site(s) Narratives. I received two separate sets of narrative information in regard to training officers and students' perceptions in the EC. The first document was received from Peterson AFB, CO, Space Command (SPACECOM), memoradum, dated April 18, 1997, signed by Gerard J. Gendron, Jr. Lt Col, USAF. The second memorandum was received from Southern Command (SOUTHCOM), dated August 1, 1997, signed by SGT Jonathan T. Edwards, Quarry Heights, Panama, the Joint Operations Intelligence Center. The first memorandum was submitted voluntarily as this participant was not available to be a part of the first FGI in person on April 22, 1997. The

second memorandum was solicited in an effort to corroborate Data Sets I, II, and III. I

requested the SOUTHCOM participates to complete the same set of FGI questions used

with the NMITC focus group on MAY 28, 1997. The SOUTHCOM group had 3

students in attendance in the EC on May 28, 1997. They collectively answered the

questions using one memorandum as their response. The information received from these

two distant site locations were analyzed and examined. Open coding was initially used to

identify the general themes and categories. Then, I used axial coding to further sift

through, segment the information, clarify the text, and examined each line of text for

possible multiple meanings to generate additional data to validate and corroborate

previous data collected.

<div align="center">Analysis of Data</div>

Stake (1995) claims that analysis means taking something apart piece by piece in

the context of the study and putting it back together with cohesive and clarified meaning.

In essence, that is what I have tried to do with this case study. Further, Marshall and

Rossman (1989) assert that "Designing a study in which multiple cases are used, multiple

informants or more than one data gathering technique can greatly strengthen the study's

usefulness for other settings" (p. 146). Stake (1995) asserts that the use of multiple

sources supports the concept of triangulation and further claims that triangulation is

"working to substantiate an interpretation or to clarify its different meanings" (p. 173). I

employed triangulation by using data set IV from two different distant site locations.

<div align="center">47</div>

Further, triangulation lends support to the concept of transferability of the study's findings based on comprehensive and thick descriptions that can be compared to theory and as well as to other cases (Merriam, 1988; Yin, 1994).

Open and axial coding techniques were used to analyze this case study's data. Open coding is a process of analyzing information gathered in depth and breaking the information down into digestible chunks to identify concepts and categorical data. Categorizing is a process of identifying and grouping concepts that relate to the same phenomena (Strauss & Corbin, 1990). Axial coding is a process of taking the a part the open-coded data (concepts and categories) and putting it back together in different and new ways by making connections between the categories and subcategories, essentially allowing the data to tell a story.

Data sets I, II, and III were videotaped, examined, and transcribed into research notes. The research notes were initially open coded using The Ethnograph V4.0 software program. This is a program specifically designed for the analysis of text-based data. I used the software program to sort and sift through the transcribed information identify categories, themes, and patterns. The synthesis of this data helped to draw inferences and clarify meanings.

Additionally, I further coded the open coded data by sorting through each line of the transcription. The Ethnograph V4.0 software program was used to perform the initial axial coding. Taking the data apart line by line and segmenting the research notes to

examine for multiple meanings, I linked bits and pieces of information by identifying

similarities, differences, themes, and patterns among the different data sets. During the

axial coding process, I linked threads of data to identify factors illuminated in the original

data sets. Further, other factors were discovered that were not identified in the original

data set.

During the analysis phase of the study, I was mindful that my job experiences

included management and administrative responsibilities for the JMITC's A/V DL

capability from March 1991 through August, 1996. This meant that I, no doubt, brought

a certain quality of professional sensitivity to this case study. My perceptions of A/V DL

have been shaped by my professional and personal experiences. I completed two

certificate DL programs -- The Teletraining Institute, Oklahoma State University and the

NSA/NCS Distance Learning Teaching Methods Course. I realize that my biases may

have shaped the way I viewed, understood, described, and interpreted the data for this

study. In other words, my own bias is perhaps the greatest threat to this study's

credibility; I believe that: (a) DL is a viable alternative to resident training, (b) DL can be

a force multiplier to reach and teach military and civilian personnel in distant locations

around the globe, (c) DL is just as effective as resident training when designed and/or

reconfigured to interactive television standards.

Furthermore, response bias may have threatened this case study's credibility in the

manner the FGI questions were structured and presented to the two different focus

groups. As noted, I conducted the first FGI using the JWICS network in the JMITC EC;

I conducted the second focus group in person at a distant site facility, NMITC, Dam

Neck, VA.   In an attempt to reduce bias and enhance objectivity in this case study, I did

the following:

1. Used the JMITC DL Videoteletraining Program Manager, Lt. Col. H. Alan Trask, to

read and examine my research notes and data analysis to point out any possible

discrepancies in the research notes and analyses. Lt. Col. Trask also sit in on my first FGI

on April 22, 1997 and the observation in the EC at the origination site at JMITC on May

28, 1997.

2. The case study research data were verified and cross checked by using the narrative

text information from the two distant site locations (data set IV) to corroborated data

generated by data sets I, II and III.

CHAPTER 4

Presentation of Findings

This chapter presents the findings of the study. The chapter is divided into two primary sections. The first section identifies key factors pertinent to the implementation of DL in the electronic classroom followed by a rationale, associated problems, and potential strategy solutions to remedy problems in the EC. The second section identifies other factors and strategies important to the implementation of DL in the EC.

The findings are a synthesis of data from: (a) one focus group interview with data based on perspectives of training officers/managers, facilitators, and students; (b) one DL EC observation checklist and data analysis; (c) one focus group comprised completely of students; and (d) two sets of narrative data from two different JWICS distant site locations.

Interaction

Interaction was found to be one of the essential factors that make students feel a part of the EC. When the FGI students were asked what were the effective strategies used by the instructor in the EC, they immediately thought of the strategies used to engage them and to encourage interaction. A FGI student at the NMITC stated that "Learning should involve the students; students learn more when they participate and do something that help them to re-enforce the instruction or concepts of the lesson."

Students wanted to be engaged in the learning process and saw why interaction is important to adding quality to the instructional process in the EC. Another student posits that interactivity is "rather important for students to participate to feel involved in the learning process."

Rationale. The identification of interaction as a factor is not surprising since it is one of the cornerstones that add value as noted in the literature review. Therefore, this point is rather consistent with findings in the field.

Problems. The barriers that inhibit interaction in the EC are multifaceted. The problems outlined below provides an overview of some of the issues that hinder operations in the EC.

Students saw the telelecture as a barrier when the instructor lectured for long periods of time without some type of question or activity intervention. One student indicated that when the instructor talks "too long without asking questions and doing something different" attention to the telelecture decreases. To follow up on this point, I asked how long is too long for lecturing before some other kind of activity is introduced in the EC and the student replies that "I would say about 15 to 20 minutes . . .that's long enough" to lecture in the EC without some type of instructional intervention.

The technology caused distractions by producing discomforting sounds beeps during the telecast. The noise levels of these beeps were distracting to students because they seem to pay more attention to the beeps versus the lecture during the noise

intervention.   As the SOUTHCOM group insisted, "Classroom instruction was

continuously interrupted due to incoming transmissions of other student bodies who were

either dropped off the network or arriving late."   What is meant by this is that as the

different sites connect to the conference on the network, there are beeping sounds that

degrades the instructor's lecture. Another NMITC student stated, "sound and noise

caused by the transmission in the equipment and wondering how others would perceive

my response in the EC at the other sites" are inhibiting factors for not wanting to

participate and be involved in the EC discussion. One student stated, "When the distant

sites are coming on the system that funny sound that beeps to let you know a site is

coming on is a little distracting."   Based on one student's perception, another problem

that is inherent in the hardware is the "two-way interaction in that you could only see who

was talking at any given instance."   The JMITC EC system design allows one distant site

to be seen at a time; the site that speaks up first is the one that the system automatically

rotates. One student commented that "the monitor's screen would constantly shift

automatically from place to place as soon as someone spoke up. That was a little

distracting."   On the other hand, another student states, "being able to see all the sites is

not a barrier but the transitions, extra movements that are caused by the transmission are

seen as barriers because they inhibit some people from speaking up." When more than

one site speaks at a time, the shifting and movement of the incoming pictures on the

monitor are perhaps distractions.

Students believed that the separation of instructor from students at the distant

locations was another barrier in that the distance inhibited interaction. One of the

students responded, "The questioning helped to make the class more like a real classroom

experience, but it did not overcome the sense of separation from the instructor."

Additionally, the FGI students at NMITC indicated, "watching a monitor without

interacting about the lesson in some way gets boring because we are physically separated

and interacting helps us distant site students feel involved. . . .and it offers a personal

touch that helps bridge the distance gap."

        <u>Strategies</u>.   Students identified several strategies that work to overcome barriers

to interaction in the EC.

           <u>Protocol</u>. Protocol is a strategy used by instructors to facilitate orderly

procedures about how to go about organizing information flow among the distant sites

and how distant site students participate and interact during the telelecture. And once the

telelecture begins, the instructor sets the pace of delivery and presents information in order

to generate active participation by students among the sites listening to the telecast.

During the FGI at NMITC, a student responded "Conferencing in students at the different

sites took too long ."   By this statement, the student means that the instructor calls on

each distant site signed up for the telecast to verify that the sites are on the telecast. This

is a necessary procedure which allows the site to be called on for questions and feedback

during the telelecture. On the other hand, the student group from SOUTHCOM insisted

that "Distractions caused by the instructor at the beginning of the telecast were quite understandable." Perhaps this type of response is more reflective of the maturity that military students bring to the learning environment since they have been in the workplace for a period of time and have responsibility to perform military mission related duties that support the defense of our nation. Additionally, the same student/facilitator group reflects on protocols when they reported, "The instructor had to delay the commencement of the instruction in order to wait for students coming on-line." In this case, the "coming on-line" is a necessary part of implementing and carrying out procedures to start instruction in the EC.

Questioning. During the NMITC FGI, I asked what were the effective strategies used by the instructor to get students involved and interested in the telecast lecture. Without hesitation, a student responded that "Questions are always helpful because they help you better clarify your own thoughts and in the EC you can hear answers from others at the different sites who might have a different spin on it based on their job and duty experiences." One student felt that the questions "personalized the lecture more." Additionally, questions "varied the delivery . . .and gave us an opportunity to interact" with students at the remote sites. There seem to be a consensus among the students at NMITC that "Asking questions about the concepts and applications is an effective technique for the instructor to gain control and guide the discussion." Further, it was stated that "Questioning is an excellent strategy for re-enforcing learning and the

points covered that are important." Just as important, one student's response was that questioning "is one of the strategies used that gets students to think more about the concepts of an issue and how to apply the learning in the real work situation." And finally, a FGI student states that:

When the instructor asked questions, it was effective in getting us to think about the concepts that were being discussed. Questions are always helpful because they help you better clarify your own thoughts and in the EC you can hear answers from others at the different sites who have a different spin on it based on their job and duty experiences. (May 28, 1997, FGI)

Student Guidebook. Most participants in the study agreed that the student guidebook was beneficial in supporting interaction in the EC. The FGI students from NMITC said that "The guidebook is great for taking notes. . . (it) can be used later to share information with others who might not have the opportunity to get training right away . . .especially new troops assigned for duty here." Moreover, another student insisted that:

The student guidebook is also good because the student can write additional notes in it and spend more time listening to the instructor rather than trying to write down word for word everything the instructor says. Because when you're writing down notes and trying to listen at the same time, you can miss other important

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points. The student guidebook has graphics and space to fill in important points from the lesson.

On the other hand, another student stated that he likes it when "the student materials support the lecture." Another important point is made during the FGI by a student when he stated, "If the network's technology is designed to be interactive, then it is important to design course materials that are interactive and ensure that all students get guidebooks with interactive materials." Following up on this thought, I asked the FGI students to identify examples of exercises or activities that could possibly be used to help generate involvement and interaction in the EC. A student responded, "Fill in the blanks activities, case study with questions at the end or discussion points, games/puzzles, and job-site analyses related to specific issues." Supporting this notion, another student who stated, "I think better illustrations that match the learning objectives would be great in the student guidebook." Further, another student concluded that he "found the handouts to be helpful and very informative." The participants agreed that "exercises and work groups could enhance the quality of the instruction in the EC." The exercises in the student guide can support individual as well as group work if audio or video connection fails for a period of time. These type of exercises can also support preliminary work prior to the telecast to get students involved early on in the learning process.

Summarizing. Another strategy identified by students was summarizing. A student in the NMITC FGI stated, "For me, summarizing at the end of the specific

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concepts was also beneficial, especially for the students who do not take good notes."

Another student agreed and said that "summaries capture important points that you

might've missed when taking notes."

Participation.   The students identified participation strategies to help

overcome the barrier of physical separation in the EC. The student/facilitator group from

SOUTHCOM reported, "There were four effective strategies which captured students

interests...student participation....use of real-world contingencies...use of concise

graphics...instructor interaction." A FGI student at NMITC said, "Learning should

involve the students; students learn more when they participate and do something that help

them to re-enforce the instruction or concepts of the lesson."

Distance Learning (DL) Technology

Students identified the DL technology as another factor that must be taken into

consideration in order to implement instruction in the EC. The DL technology in the EC

at the JMITC includes: (a) the EC master podium equipment with electronic commands,

(b) telecommunications equipment, (c) ELMO graphics display panel, (d) mobile

cameras, (e) the whiteboard for writing, drawing illustrations, and transmitting

information to distant sites, and (f) and the stationary microphones attached to the ceiling

panel mounts.

Rationale. The EC technology is the primary link in the network configuration

that permits communication in real time -- it allows two-way communication and

interactivity among the distant sites that are electronically linked on the network. This

capability gives the instructor the ability to lecture and communicate in real time with all

the remote sites. The technology and media also allow a means of communicating with

students and facilitators at other geographically dispersed sites on the network.

Problems. The participants in this study identified several problems that can

adversely impact the operations in the EC. However, since the JMITC EC is still in its

infancy stages with the technology and implementing DL, students seemed to display a

tolerance with the technology deficiencies. A NMITC FGI student insisted, "In time I

think we will all adjust to flaws in the technology. . ." In this instance, the student is

probably referring to the noise beeps, the shifting movements, uneven picture

transmission, and the compatibility and interoperability of the equipment systems at the

other sites with the origination site. In general, students seemed to display acceptance of

the "flaws" in the technology since they felt that "if VTT in the EC is the only way that I

can get trained or nothing at all, I'd rather take the training in the EC . . .something is

better than nothing." The technology problem was voiced by the SOUTHCOM

student/facilitator group in this way, " Despite its minor difficulties, the technology used

to make this course available to SOUTHCOM student body delivered a tremendous

impact." This is an indication that these students are somewhat forgiving of the "flaws" in

the technology as long as they can have access to training. This group also said that the

technology ". . . allowed the student body to interact with both the instructor and other

student bodies." A student in the first FGI stated, "When the equipment works, the VTT works well."

A problem that the students identified was the mute capability on the master control console. A NMITC student insisted that "the instructor did not like the mute capability of the system, but there are advantages to it. It allows students opportunity to discuss classroom issues or lecture. Also it does not interrupt the lecture." The first FGI (training officers, facilitators, and students) said:

The system and equipment problems seem to be the biggest road block. Problems that were quite noticeable were the poor audio quality and having to speak toward microphones located in the ceiling, lack of a dedicated individual to operate the cameras and deal with the technical difficulties.

Another problem identified by the students was the effective use of the technology by the instructor and the facilitator. The FGI students agreed that "the instructor needs to know how to use the equipment effectively." In this particular instance, the origination site instructor and facilitator had problems moving the electronic pencil arrow off the monitor screen at the beginning of the telecast; this caused a slight delay in the telelecture. Another area of concern for the students was the instructor's competency and training in using the equipment properly. One student stated, ". . .the instructor's competency in manipulating the equipment and presenting the lesson content in an interesting manner are critical"

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to operations in the EC. A NMITC FGI student summed this problem up when he said, "When they don't know how to use the equipment properly, there are delays that cause students at the distant sites to lose interest in the telecast by just sitting and waiting when there's work to do on the job." Another student defined and summed up this problem further when he said, "A case in point is that at the broadcast site both the facilitator and the instructor had problems with the electronic pointer option on the master console and this caused a short delay in getting this training started."

The first FGI group said, "Teaching instructors how to teach in the EC is probably different; teaching in the EC is like teaching in a television studio instead of from a lectern in front of a class." Another student stated, "I think attendance at the NSA course would be valuable for instructors in dealing with the EC unique environment using audio and video. The course might help them to understand what to do when technical problems occur, what contingency plans to have in place to keep students interested and involved in the lesson."

Students identified another problem with the media used to transmit information to the distant sites. A student said, "I think better illustrations that match the learning objectives would be great. . ." In reference to the graphics and visuals aids used in the EC telecast, a student said, ". . .materials must be design and paced to fit the technology

medium." This statement inferred that the instructor needs adequate time for planning and developing EC materials and graphics.

   Strategies. The following section provides strategies to remedy technology and media problems in the EC. Based on student perceptions, their comments showed a degree of sophistication and understanding about the technology and media problems encountered in the EC.

      Technology Compatibility. "The first thing should be evaluated is the technology hardware to determine if it is compatible with the other sites and if it is operating properly," stated one of the FGI students from NMITC.   Some distant sites have different equipment and different contractors install the equipment. It is important that the equipment is compatibility and meet the specifications for interoperability to ensure that the equipment and configuration are congruent with the origination site.

      Planning Time. The study participants felt that the instructor needs adequate planning time to ensure effective preparation for teaching in the EC.   The EC is different from the conventional classroom, one student surmised that it "takes a lot of time to plan all this and be ready to teach in the EC."   Students agreed, "It takes more time than the traditional classroom because the instructor has to know something about the equipment, structuring activities into the lesson to keep students at the distant sites involved and interested in the lesson."   Consequently, the NMITC FGI group agreed that

the time it takes to prepare for instruction in the DL EC is more labor intensive than the traditional classroom, a student summed it up this way:

It appears to be a lot of work to teach on a network in the EC. There is graphic preparation and lots of them. . .nearly 100. Then the materials must be paced and designed to fit the technology medium. It seems to be an incredible amount of material and planning to make the EC operate like clock work.

It is clear that the instructor requires adequate time to prepare for teaching in the EC. The EC is different from the conventional classroom; the EC has technology that must be accommodated in the lesson planning component and the EC has more than one group of students to deliver the telelecture.

Staff Development Training. Many of the participants believed that instructors needed to be better trained to teach in the EC. A NMITC student said:

The instructor's competency in manipulating the equipment and presenting the lesson content in an interesting manner are critical to helping students feel comfortable in the EC. I think the instructor can put the distant students at ease by showing his or her own comfort with the EC systems. If students feel comfortable, it's going to help make the training a success. Additionally, it's going to make them like learning in the EC.

Instructor and Facilitator. The students agreed that both the instructor and facilitator require specific training to ensure effectiveness and appropriate use of

equipment in the EC. The SOUTHCOM group stated, "The instructor must be trained to respond to the unique scenarios that DL in the EC presents." It appears critical that the instructor acquire training in interactive television skills (ITV) to maximize his/her instructional performance in the EC. The training should include ITV strategies and techniques using the actual EC that the training will be delivered from to the distant sites. All the participants agree that "Prior training . . . will boost instructor confidence and benefit the student body as a whole." Students agreed that:

> Facilitator training is also paramount to the success in the EC. Proper training for the facilitator must include both operator and supervisory training on the videoteleconferencing equipment include troubleshooting and the concept of videoteleconferencing. Such training would allow for seamless learning in the EC environment.

Interactive television (ITV) training is important for both the instructor and the facilitator; it should include behavior and gesture awareness on how behaviors are perceived by students at the distant sites. One student in the FGI at NMITC said, "Mannerism and body language are important because they can either promote positive or negative images and psychological distracters for students at the distant sites."

Another one of the FGI students said that the instructor "needs to know how to interact with students at multiple sites and engage them in the learning process if he plans to keep their attention." On the other hand, another FGI student insisted that:

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The facilitator has to know more about the equipment and administrative details

since he is the one to set up the conference and make sure we have our materials.

The instructor needs to know about how adult students learn and what's important

to their jobs and how the subject matter relates to the work environment.

One student surmised:

Faculty and facilitators should have the necessary skills to make use of the

equipment and make the subject matter instructive and interesting. I like it when

the instructor is well prepared and the student materials support the lecture.

Just as important, a FGI student insisted that "it seems the instructor and the

facilitator is a team trying to make the EC work smoothly." When one considers the

traditional classroom, usually it is the instructor who is managing the classroom without

the help of a facilitator and without the EC technologies.

The instructional "team" concept needs further study as it relates to the EC

instructor and facilitator. There is a definite dependent "partnership arrangement" with

the instructor and facilitator in the EC which does not exist as a constant in the

conventional classroom.

Making Students Feel Comfortable in the EC. Participants in this study felt it to

be critically important for the distant student to feel comfortable in the EC. A FGI student

said, "The instructor's competency in manipulating the equipment and presenting the

lesson content in an interesting manner are critical to helping students feel comfortable in

the EC."   Another student stated, "I think the instructor can put the distant students at ease by showing his or her own comfort with EC systems. If students feel comfortable, it's going to help make the training a success." Moreover, a FGI student surmised that the instructor should "relate issues and crises we face at work on a daily basis . . ."   Perhaps is another strategy that can personalize the instruction to make students feel at ease learning in the EC.

            <u>Visual Aids and Graphics</u>.   The students agreed on the importance of good, clear, and concise visual aids and graphics. These should be designed to fit the technology medium.   Further, students felt that the visual aids should support the course objectives.   One student said, "The illustration and viewgraphs helped in teaching the class. And the handouts were very useful for following the lecture and also for later use." Another student stated, "Since we are separated from the instructor, I think the illustrations help clarify the lecture concepts better than narrative statements and points on a graphic."   Responding to my question about what the instructor did to keep the students' attention, one of the students immediately responded, "He used more than one medium to deliver the lecture; he used illustrations and moved away from the master podium console."   Another student said, "Visual graphics such as the illustration on the whiteboard could be much larger and it could have been placed in the student materials." The SOUTHCOM group reported that "the use of concise graphics to effectively reinforce a teaching point" was also beneficial to the instructional process in the EC.

Another student said that "the use of the whiteboard with the illustration to show how the concepts work was good. And, the illustration was another strategy that was used to place emphasis on important points. This also gave us a chance to interact with another technology other than the graphics display."

The use of the different media supports the instructor's movement from behind the master podium. Perhaps this transition from one delivery medium to another make students feel that the movements are spontaneous, similar to a traditional classroom setting. One student said, "The whiteboard also gave the instructor a chance to move from behind the master podium and console." To follow up on this point, I asked how did this movement affect the EC experiences. A FGI student responds by stating that the "Use of a different EC medium and change of location made it more natural . . .more like the traditional classroom setting. I would like to see more illustrations used in the EC."

Videotapes.   Another medium that could be used to supplement the instructional process is the videotape. One of the FGI students said that the "videotapes of previous sessions can be used to augment the session."

DL Factors Pertinent to Operations in the EC

This section identifies several factors that contribute to the implementation of DL in the EC.

Strengths of Instructor. The response from the SOUTHCOM group revealed that "Overall instructor performance was superb." They said that the "instructor's high level

of professionalism, while maintaining an informal and comfortable learning environment" was noticeable.   Students felt that the "instructor managed to maintain student body interest through various techniques such as asking questions, displaying concise, relevant graphics, and providing his experiences from the I & W field."

Furthermore, the SOUTHCOM group stated, "Although the students some degree of anxiety when being called on to answer a question, the majority of the student body answered correctly."   The students felt the instructor's "summary points made at the end really clarified the important points" in the telelecture.   One student said that the instructor "did show a graphic with his access numbers, fax, and e-mail. However, it should also be printed in the student guidebook for easy reference."

Familiarity with the Instructor.   Students felt that some familiarity with the instructor made them feel comfortable in the EC environment.   The SOUTHCOM group reported that "since some members of the SOUTHCOM student body were familiar with the instructor the level of anxiety lessened."

Instructor's Body Language. Students felt that the instructor's mannerisms and body language are rather noticeable in the EC; they can also be distractions.   The FGI students revealed that the instructor's "body language showed that he wanted to be in control and he might of felt that we were taking control when the audio was in mute." The FGI students at NMITC maintained that the instructor's "interactions" and mannerisms made them feel that they could "call him to discuss any points in the lesson."

Importance of Facilitator. The SOUTHCOM group insists that the facilitator "Allowed for seamless operations" in the EC. All study participants felt that the facilitator should be "knowledgeable in the troubleshooting aspects of the JWICS systems. . ." Students also believed that "Facilitators should be requalified annually to ensure that the well-trained operators and assistant instructors are in place to provide for a successful classroom session." The first FGI group stated that "at the distant site, the site facilitator is depended on to help guide the instruction and, in some instances, teach when the equipment acts up or goes down." Perhaps the term "assistant instructor" refers to the site facilitator when he has to fill in for the instructor when the equipment fails at the distant site. All participants agreed, " The facilitator's role is very important in that at the remote sites, it takes on an increasingly vital role when you recognize that there is limited personal contact with the instructor."

The facilitator and the instructor as a "team" is a new kind of arrangement in the EC; both depend on the other for support in implementing instruction in the EC. This arrangement is a new one to the instructional process as we have known it in the past when compared to the traditional classroom environment.

Contingency Plans.   The participants in this study agreed that contingency plans are needed when the: (a) equipment or telecommunications fail (b) audio fails, and (c) system fails to transmit video.   The SOUTHCOM group said:

In case of a loss of audio. . .appropriate backup system is recommended in a chat

dialog box. This would allow for the continuation of instruction despite the

inconvenience of the instructor typing his diction instead of verbal delivery. The

only contingency for the loss of video is continued audio instruction with the

assistance of the student handouts.

Supplemental Activities. Students felt that supplemental activities could be

developed and used as a part of the contingency planning.   In response to my question of

what types of learning activities could be used for contingency plans, a student replied:

Case studies like the one used in this session that has questions. Students can

complete the case study questions and turn in to the facilitator to fax back to the

instructor. If the case studies require references to complete the assignment, the

references should be in the EC for students' use. Extra student activities could

also include reading assignments and back on the job assignments. Then students

could complete questions related to the assignment.

Another FGI student said, "The lesson could include extra activities for

independent study projects."

Facilitator as Subject Matter Expert (SME). In response to my question

about backup plans in case of telecommunications problems and/or technology failures,

one student in the FGI said, "A knowledgeable facilitator at the distant site could fill-in

until the system is back up and running properly." Another student stated, "It's important

for the facilitator to manage these administrative details when the system goes out."
These comments are perhaps indicative of the importance of having a knowledgeable SME
facilitator available in the EC when one is available at the distant location. In some
instances, some distant locations have seasoned SMEs assigned to the location for a tour
of duty who have taken all the resident training courses.

Scheduling. Due to time zone differences, scheduling was another aspect that
should be considered in the execution of EC operations. The SOUTHCOM group said,
"The scheduling should be tailored to fit all Unified Commands' schedules so that it has
the maximum value added." Following up on this point with the FGI students, I asked
how does scheduling impact their site EC operations. A student replied:

> Scheduling is a definite factor if we aren't in the same time zone. Depending on
> the time the broadcast site schedules the DL courses, we might have to re-arrange
> our work schedules to take the class or get someone else to fill in during the class
> session.

Another student said, "It would help to poll the sites to determine the most appropriate
time for most and set up schedules around the best time for the most sites to get
maximum participation on the system."   The FGI students at NMITC agreed that the EC
training "should not be scheduled over the lunch hour." I asked why, and a student
answered, "At this site, it would possibly reduce attendance." Another added,
"Scheduling for students overseas probably is a bigger problem since there is a 4 to 8 hour

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difference which means the DL VTT schedules should some how try to accommodate

OCONUS students by running some classes at hours suitable to them."

One of the FGI students seemed to realize that when accommodations are made to

satisfy all customers across the time zones it has a ripple effect on the instructor as well as

administrative coordinations. The student insisted that it "would put an extra burden on

the instructor to teach at weird hours." Any schedule of EC courses that are 4 to 8

hours different from the traditional Eastern Standard Time schedule between 08:00 and

5:00 p.m. would possibly tax the instructor and the facilitator beyond the usual work day.

Continuous Evaluation. All study participants felt the evaluation is critical to

ensuring effective programs in DL. The SOUTHCOM group reported, "The continued

evaluation of the elements of hardware technology systems, subject matter experts (SME),

instructor, and facilitators to enhance existing DL program" is critical to continued EC

offerings. Another student said, "Systems should also be evaluated for obsoleteness and

improvement with instructors and SMEs evaluated on a quarterly basis to ensure

continuity with current trends and analysis." A NMITC FGI student said, "The first thing

should be evaluated is the technology. Then, the next thing to be evaluated is the

instruction and the content itself. What I mean by that is if the content supports the lesson

objectives." Another student added, "The instructor's ability and skills to teach in the EC

should also be evaluated." In response to my why question about the instructor's ability,

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another student answered, "The instructor's competency in manipulating the equipment and presenting the lesson content" are important to the success of the EC programs.

Design of the EC. Students felt that the design of the EC was another aspect that should be evaluated. The design and comfort of the EC can promote satisfaction in regard to feeling comfortable in the learning environment. In response to my question about whether or not they could think of anything else that should be evaluated in the EC. One student said, "The appearance and suitability of the EC is important and it should be evaluated in light of its instructional capability. Is the equipment properly placed? Are the microphones in the most effective position, is the room too cold or hot? Are the chairs comfortable enough to sit in for more than a couple of hours at one time?" The FGI students at NMITC agreed with some of these insights when they said, "The instructor should be free to move about in the EC without being tied to the master podium where the operational features of the system are fixed." In the JMITC EC, the instructor operates the master podium console without the assistance of a origination site facilitator. The feature inhibits spontaneous movement. JMITC's EC is designed to allow the instructor to control all the electronic features. The instructor is at the podium during most of the telelecture. In the I & W course observed, the instructor operated the features on the master console and simultaneously move to the whiteboard to discuss an illustration. This transitional movement from one technology medium to the next usually takes practice to be smooth and minimize student distractions.

Another FGI complements that statement when he added, "That might seem silly, but it's true if I am comfortable, I will probably be more attentive to what the instructor is saying and perhaps learn more."

EC Cost Avoidance/Savings. Several participants in the study felt as the SPACECOM training officer did when he stated that the EC "initiative and program is worthy when trying to cut costs." The SOUTHCOM group also supported that idea when they responded, "Distance learning technology . . .saved the Command" money by not sending troops to resident training. Perhaps, the EC benefits over time seem to be (a) the potential to reduce TDY and associated travel cost for resident training and (b) the capability to offer similar training on site at duty location for a few hours a day versus sending troops away for a week or longer which could adversely impact mission readiness operations, already limited manpower resources, and productivity. The FGI participants agreed that the EC could produce a cost avoidance by offering DL courses. The first FGI participants said, "JMITC has made a good first step to export training to the field. Just keep at it . . .this is an excellent first step." Another student said, "Due to resource shortfalls, this Command cannot afford to send large numbers of personnel to resident courses; the video conferening sessions become an effective alternative." The FGI students at NMITC all agreed, "VTT can cut TDY and per diem cost tremendously. DoD spends up to $20,000 in TDY and per diem costs when we one resident course for one week. VTT can possibly cut that cost in less than half." Another student added that

"DoD has invested all this money and every effort should be made to maximize the effectiveness of the EC."

EC Provides Access to Training. All study participants felt that EC course courses provided access to training that many of the troops might not have had the opportunity to take otherwise since the Commands are operating on limited TDY dollars and cannot afford to send large numbers away to resident training. This is reflected in a statement from the FGI students at NMITC when they considered EC training or no training at all; one student stated that if the "EC is the only way that I can get trained" then he would opt to take the EC training. The SOUTHCOM group replied similarly when they reported that the "technology used to make this course available . . .delivered a tremendous impact." It allowed the students at SOUTHCOM to "interact with both the instructor" and students at the other distant sites. The NMITC FGI students agreed that "this is the next best thing to resident training; it offers us access to training that some of us might not have had the opportunity otherwise. At least we did not have to go to Washington to get this refresher training and the updates that are crucial to doing our jobs."

EC Augment Resident Training. All study participants felt that EC training should supplement the resident training. The Training Officer from SPACECOM reported that "VTT can assist us tremendously with training requirements." However, he further stated that "It should remain an augmentation system vice the primary means for formal training."   Participants in this study agreed that "video teletraining sessions should

supplement in-residence training with specific updates and changes to the field of study."

The NMITC FGI students agreed with this, they responded, "One recommendation is to

ensure that the DL VTT augments resident training with important updates."

Marketing EC Training. All study participants felt that it is important to announce

well in advance the EC course offerings and the market the EC program to generate

enrollments. The SPACECOM training officer's feedback reported he felt that JMITC

does not market the EC courses and that the course announcements do not clearly explain

what the EC course is about. The SPACECOM training officer believed that the low

enrollment in EC courses at SPACECOM was due to a lack of marketing the EC and its

offerings. This could possibly have an adverse effect on enrollments when training

officers and students do not know what to expect and what the benefits are in taking the

EC course when compared resident course. The training officer responded, "Students

may be more interested if they know the EC training will help them stay up to date in their

duties."

The FGI students at NMITC agreed, indicating that the EC courses should be

"announced and that marketing of the VTT courses" is important to future enrollments.

Another student added that "students may be more eager to gain such insights and enroll

in the VTTs in order to stay current in their jobs."

Summary

The differences in importance noted between the students' and the training

officers/facilitators' opinions related primarily to the emphasis place on: (a) what the

instructor does to get the students involved in the instructional process, (b) the operational

capability of the technology to ensure seamless instructional delivery, and (c) return on

investment or cost savings. In some instances, students perhaps were more concerned

about the strategies the instructor used that they felt were important in the instructional

process. Training officers and facilitators were more concerned about the technology's

operational capability and the return on investment (ROI). ROI issues included cost

savings and cost avoidance as a result of personnel being able to take training in the EC at

the duty station vice resident training at a geographically distant location in which the

expense would be the responsibility of the parent organization. However, all participants

in this case study seemed to agree on faculty and facilitator roles in the EC.

Discussion: Case Study Unit, Participants' Background

There are several reasons why Military personnel might have responded to the FGI

questions as they did.

Military students are unique in that they bring a sense of savvy, maturity and self-

directedness to the learning environment based on their military experiences.   In many

instances, military students enter the learning environment with a seasoned reservoir of

experiences and to acquire a skill or sustain a proficiency that is directly related to the job

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being performed. What they have at stake is perhaps somewhat different from the

traditional student. Their performance may have direct impact on readiness and

deterrence against national or global threats.   As a result, that is probably one of the

reasons why military students are more apt to forgive or overlook the "technology flaws"

inherent in EC technologies to get the required knowledge or skills needed by any means

to get the job done. Perhaps, too, military students are conditioned during the process of

acculturation into the military that they must learn to deal with the constraints,

shortcomings, and unanticipated problems that may be a daily occurrence on the job.

Subsequently, the EC emerging technology problems are perhaps no different from

similar problems that troops face in daily military transactions as well as in battlefield

conflicts when equipment does not work as prescribed.   Participants' opinions and

feedback in this case study suggested that military personnel possess a forbearance that is

somewhat different from the traditional younger classroom student when they encounter

technology shortcomings and technical problems in the EC.

Further, a few of the participants knew the instructor; this might have put them at

ease in the EC setting.   As the researcher in this study, a few of the participants also knew

me from the inception and development of the JMITC EC since 1992. Perhaps this

familiary aided in participants' willingness to be a part of this study and to give open and

honest feedback to help make improvements to the JWICS network ECs throughout the

Commands and Intelligence Service Schools.

The strategies and solutions addressed in this study's findings may or may not have full relevancy in similar DL EC settings with traditional classroom students. Nonetheless, the strategies and techniques addressed here appear to hold promise as remedies to overcome certain problems, enhance quality, and promote success in the EC learning environment.

Chapter 5

Summary, Conclusion, and Recommendations

Summary

The purpose of this research case study was to identify factors and supporting

strategies that contribute to the implementation of distance learning (DL) in the electronic

classroom (EC).   The study participants included military training officers, facilitators,

and students.   This group was chosen because the study investigated a training program

unit that these participants had been involved in either as a student, facilitator, and/or

manager.   The focus of the study was on the perceptions of participants' experiences

about the EC. The study also examined how the strategies impact the quality and success

of DL. Using a qualitative methodology, the case study, -- focus group interviews (FGIs)

and observations -- I investigated factors and strategies that contributed to EC

operations.

Initially, a list of category domains with questions and an observation checklist

were developed based on: (a) a review of the literature in distance learning and adult

education and (b) an examination of JMITC's DL EC program documents. The initial

question domains were: instructional strategies, types of curriculum, staff development,

interaction and involvement, site facilitation, and evaluation. There were 13 questions

used during the first FGI. The initial observation checklist was developed with 15 factors

and 13 instructional strategies. After the first FGI on April 22, 1997, the observation

checklist was revised and 5 additional factors were added prior to my observation in the EC. The observation checklist was revised to more narrowly focus on specific components, interactions, and strategies as a result of data set I.

Each of the two FGIs lasted approximately one hour and fifteen minutes. The EC observation lasted three hours. A video and audio tape recorded both of the FGIs and the 3-hour observation in the EC for further analysis. These records were transcribed, then transferred and loaded into the Ethnographic software for use during the analysis phase of the study. The FGI questions were presented in an in-depth probing style format and often followed up with why questions. As in an interview, participants were ask to respond to questions based on their perceptions. In the FGI, participants heard the responses of others and, on occasion, discussed the responses with each other, and made additional comments based on the interactions that had occurred. Through the use of the FGI, each participant was able to share their own unique experiences, opinions, insights, and perspectives about the JWICS network EC learning environment.

The first FGI was conducted in the EC from the origination site at JMITC, DIA, Washington, DC, April 22, 1997. The second data collection was the EC observation in the EC facility at the NMITC, Dam Neck, VA, May 28, 1997. The third data collection was the second FGI conduct at the NMITC, May 28, 1997, immediately after the EC observations with the same students who were in the EC training course. For the second FGI questions were revised to include 15 questions about factors and strategies and how

or why they impact EC operations.   The revised questions helped to specifically focus on the results of the previous data sets. The final and fourth data collection was information and feedback from two different distant site locations; this information was coded and used to further analyze and corroborate the findings of all the previous data sets. The information generated data that were used to triangulate the previous data sets and to substantiate the reliability of the previously collected data.

The findings revealed ten key factors that contributed to the implementation of DL in the EC: (a) instructor, (b) site facilitator, (c) staff development and training, (d) effective use of interaction strategies, (e) EC operations and trouble shooting technology, (f) designing and using graphics, (g) student guidebook/materials, (h) instructor planning and preparation time, (i) evaluation plan, and (j) access to EC training that augments resident training.   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 EC experiences. Meaningful interaction was seen as a value added factor during the instructional process. Meaningful interactions include interactions with instructor and other students at the remote sites, and the technology media that reinforced course objectives and built on learning concepts presented in the telelecture.   The study found concluded that interaction was inhibited by the technology beeping sounds when sites entered or existed the teleconference lecture, shifting of the monitor pictures from site to site during an interaction exchange, and the break up of the

pictures on the monitor due to transitions in the technology.   The audio interruptions and degradation in the technology transmissions increased students' anxiety, hampered interactions, and stymied 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, EC technologies, content and media preparation, and EC administration in order to ensure quality DL operations in the EC.   The participants felt that preparing to teach in the EC 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 in the EC. 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 EC offers a new paradigm shift in the role of the instructor coupled with the EC distant facilitator in the arrangement of a "team."   In the EC, both the instructor and the facilitator depend on each other for the implementation of the distance learning in the electronic classroom. Essentially, they support each other and perform their EC duties in concert in order to implement DL.

<u>Relationship of Findings to Previous Research</u>

This section addresses how this case study's findings compare to previous research in the field. These comparisons are important to acquire a better understanding and improve strategies to maximize effective practices in the field.

The findings that a well trained instructor and facilitator, access to training, staff development and training, designing graphics, interaction, and evaluation were important in successfully implementing DL. Additionally, these findings were rather consistent with comparable research studies in the field, qualitative as well as quantitative. TRADOC (1994) concluded with a list of similar factors that impacted the implementation of DL. Comeaux' (1994) concluded that one of the indispensable elements of the DL program is faculty development (p. 84). On the other hand, the finding in regard to the correct use of the EC technology did not receive much attention as a value added factor in the literature nore in previous research studies. However, the Office of Technology Assessment in *Linking for Learning* (1989) clarified that the technology removes barriers and expands opportunities, yet it is the instructor who teaches. Clark (1983), on the other hand, found that technology is the vehicle that delivers instruction but it does not influence student achievement (p. 445). Further, the factor of adequate instructor planning and preparation time to teach in the EC is rather consistent with the literature in the field. Schlosser and Anderson (1994) concluded that preparatory work is especially important for DL programs. The Office of Technology Assessment (1989) found that DL teachers find that

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they need to give more advanced preparation to student interaction strategies, the design

and development of visual aids, and supplemental activities in the DL setting (pp. 11-12).

Consequently, the findings in this study confirm many of the previous research

conclusions.   In contrast to other studies, however, this study illuminated the importance

of the site facilitator as being crucial to the instructional process in the EC.   The data

revealed that the facilitator and instructor perform as a two-person team to: (a) initialize

the opening of the telelecture by testing technology operations, (b) adjusting the audio

controls, (c) making sure graphics are visible at the distant locations, and (d) ensuring that

students have guidebooks, handouts, and appropriate reference materials.

This case study adds to the literature in the field and illuminates new perspectives

about the importance of the EC site facilitator. Furthermore, the findings emphasize the

importance of the instructor and facilitator being able to correctly operate the technology

and troubleshoot the equipment to ensure smooth transactions thereby maximizing the

potential for success in the EC. The analysis of the data revealed that participants felt very

strongly that when the technology is operated correctly, it "reduces student anxiety" and

promotes spontaneous interaction which reduces the psychological distance between the

instructor and the students at the distance site locations.

Conclusions and Discussion

This section of the study is presented in a format that depicts an outline of a DL

manual – each factor representing a chapter and each enumerated item representing a

section in each of the chapters. The factors represent components pertinent to the

implementation of DL and the supporting strategies represent the instructional plan or

format for executing instruction and/or operations in the EC.

The section focuses on a baseline of factors that contribute to the implementation

and the quality operations in the EC. The factors and strategies are based on a synthesis

of the literature review and this case study's four data sets.   The factors are presented

under three separate headings to distinguish among the three primary users of the EC: (a)

training/program manager, (b) faculty/instructor, and (c) facilitator.

<u>Program Manager</u>

The training officer is the program manager and is the primary individual

responsible for the execution of the EC program and evaluation plan. Consequently, the

factors presented under this subheading support the executions necessary for effective

program management and continuous improvement.

1. <u>Evaluation Plan</u>. The evaluation plan assesses the operations in the EC. All

participants agreed that the EC evaluation plan encompasses the following assessment

strategies: (a) technology -- the technology should be evaluated to ensure interoperability

with all sites on the network and to ensure upgrades to the system. Additionally the

technology should be assessed for "obsoleteness;" (b) instructor – the instructor should be

evaluated based on his/her knowledge as the subject matter expert (SME), teaching ability

in the EC, how well the lesson content is organized and delivered, and how well

instructional strategies are employed to insure interaction and participation; (c) facilitator – the facilitator should be evaluated on his ability to operate and troubleshoot the technology, how well administrative coordinations are performed with the origination site and the other sites subscribed to receive the telelecture, and EC administration of student materials, roll call, attendance records, maintenance and transmission of student performance evaluations and/or projects outlined under course requirements in the student guide.

2. Access to Training. Access to training refers to acquiring all the necessary information about the training and insuring that the content of the training support the development of skill and job competencies at a cost avoidance for the parent organization. The strategies that support this factor include: (a) the origination site program manager and instructor conduct coordinations with the distant sites about the pertinent course information – EC schedules, time zone designates, course classification level, course content, and expected outcomes in relationship to skill and job competency development; (b) publication and dissemination of adequate course announcements for training managers and prospective students to make decisions about whether or not the training will be beneficial in updating and enhancing current job competencies; and (c) access to EC training that avoids personnel travel and per diem cost for the parent organization.

EC Instructor

All participants in this study agreed that the instructor is a primary key to quality in the EC. The data revealed that the instructor's performance is dependent upon the following factors that were important to successful operations in the EC.

3. Correct Operations and Use of EC Technology. The strategies that support this factor are based on a synthesis of the four data sets, the strategies include: (a) the instructor's hands-on practice and use of the EC technology – practice teaching in the EC with peer assessment, practice using the technology to transmit graphics and visuals, testing the audio/video controls to insure correct transmission of course information; (b) adequate planning time in the EC to develop familiarity with the EC setting and the design features of the technology; and (e) coordinations with site facilitators at the distant sites.

4. Staff Development and Training. There was strong consensus among all the participants about the importance of training for the instructor who teach in the EC and for the facilitator who helps the instructor execute operations the EC environment. The staff development and training component includes the following training strategies: (a) development of an awareness and knowledge about the EC audio/video learning environment; (b) proper use of EC technologies; (c) comparison of the differences in the EC and the traditional classroom setting; (d) effective interactive television (ITV) skills – student participation techniques, questioning, using war stories and scenarios to illustrate real workplace situations, and individual and group projects to build on learning concepts; (e) addressing how adults learn and what techniques and/or learning formats work well

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with adult learners; and (f) EC professionalism – instructor's behaviors that promote

positive and/or negative interaction, perceptions of instructor behavior and/or images as

viewed by students over the television monitors from the distance sites, and psychological

distracters -- distance, the separation of instructor from students, degradation of audio

and video, and the transmission of different noise levels when sites enter and/or drop out

of the telecast.

   5. <u>Effective use of Interaction Strategies</u>. Another finding of this study dealt

with the importance and role of interaction in the EC.   The data revealed that interaction

is the value added factor that promoted quality and success in the EC. Based on a

synthesis of the participants' responses the following strategies support this factor: (a) the

interactive design of the EC course – predetermined questions built into the lesson design,

asking probing and reflective questions, telling war stories, using real case studies,

workplace scenarios, and the use of the student guide; (b) contingency plans that include

supplemental activities -- puzzles, games, and on-the-job assignments; (c) the use of

subject matter experts (SME) and/or guest speakers to share real experiences pertinent to

the goals and objectives of the learning outcomes; and (d) the use of more than one

delivery format to deliver the telelecture – graphics, whiteboard illustrations, videotape,

audiotape, SMEs, and discussions.

   Supporting this notion of interaction is the research of Hancock et al. who

concluded that it is critically important that adult learners participate in the learning

process via DL by being allowed to contribute to the discussion and share their

experiences about their own perceptions (p. 305). Further, Law and Sisson (1985) found

that the distance learner can find enjoyment and satisfaction with DL when the programs

are clear, flexible in their structure, and there is ample opportunities for feedback and

dialogue (p. 44). Comeaux (1995) concluded that interaction and involvement were

crucially important to the students who participated in her research; furthermore, she

noted that student involvement lessened the psychological distance for students assigned

at remote learning sites.

6. <u>Designing and Using Graphics</u>. Responses from the FGI students supported

the notion that graphics included all types of visual aids – computer generated graphics,

whiteboard illustrations, drawings, and pictures. The strategies that support this factor

include: (a) the design and use of graphics and illustrations that support the instructional

objectives; and (b) the design of EC graphics and visuals in accordance with ITV

techniques that take into consideration the size of the television monitor at the distant

sites, type font size that is large and clear enough for students to see on the television

moinitors at the distant sites; and (c) conducting a pilot or trail run of the graphics and

visuals in the EC prior to the telecast and making revisions to improve clarity.

7. <u>Student Guidebook and Handouts</u>. The FGI students were the most vocal

about the use of the student guidebook; understandably, this is the group most affected by

the quality of these materials. However, all participants seemed to understand the benefits

of using the student guide and handouts that support the telelecture. The analysis revealed the following strategies pertinent to the development and use of the student guide: (a) presentation of pertinent course information – description, length of course, classification level, evaluation criteria, learning outcomes, faculty short biography, telephone and fax numbers for contact; (b) outline format of the telelecture in subject and/or topic areas to help students focus and follow the lecture; (c) use of white space for students to take additional notes during the lecture for future reference; (d) use of fill-in-the-blank questions or statements; (e) use of graphics and visuals aids strategically placed in support of instructional concepts; (f) use of summary points highlighted at the end of each module of instruction to reinforce important points; and (g) use of student guide with contingency plans in case of technical and/or telecommunication failure during the telelecture.

8. <u>Instructor Planning and Preparation Time</u>. There were similar agreement among all participants in this case study that the instructor who teaches in the EC need more planning time and preparation time than the instructor using the traditional classroom. The tasks that the instructor perform to promote quality in the EC are interwoven with the following strategies that are critical to the success of DL in the EC: (a) prepare the telelecture; (b) develop student guidebook and handouts, (c) design visual aids and graphics; (d) manipulate the technology; (e) move around the EC to use a different technology and simultaneously manipulate the master podium control buttons.

Particularly important is the ability of the EC instructor to prepare and use graphics in support of the EC instructional objectives. Consequently, planning and preparation time are essential to smooth and successful operations in the EC.

Site Facilitator

All the participants agreed that the site facilitator is another primary key to successful operations in the EC. In the JMITC EC environment, the facilitator works as part of a two-person team – instructor and facilitator -- to operationalize the EC. The data revealed that the facilitator at the SOUTHCOM location was able to readily answer questions, share his own experiences, and pose other questions during the telelecture. In this particular case, the facilitator was a SME and was, therefore knowledgeable about the course content; he added valued to the discussions by posing questions, sharing job relaed scenarios, and promoting interaction among the other distant sites.   The factors outlined in this section highlight the primary core functions the site facilitator is responsible.

9. EC Operations and Trouble Shooting Technology.   The strategies that support this factor are handled primarily by the site facilitator. The strategies are functions performed by each of the site facilitators at the distant locations.   The site facilitator performs these strategies as they are important to the successful operations in the EC: (a) troubleshoot equipment, test audio and video controls and transmissions; (b) test for the transmission and receipt of graphics and visuals with the origination site; (c) manage administrative operations in the EC – roll call, pass out student materials, set up

classroom, and explain EC operations and equipment to EC participants; (d) if knowledgeable, perform as a SME supporting the instructor's teaching points and promoting interaction among the other distant sites (this occurred in the case of the SOUTHCOM facilitator); (e) facilitate discussions and supporting learning formats by providing assistance that is deemed necessary by the instructor, insuring the appropriate references and handouts are available for students' use.

10. Coordination. This factor is important to smooth operations in the EC. Based on a synthesis of the literature review and the data sets, the findings revealed that the site facilitator manages coordinations with the origination site as well as with the other distant sites. The facilitator is the link that insures smooth EC technology and administrative operations – from setup of the teleconference, testing the audio/video transmissions with the origination site, troubleshooting the technology, insuring the student course materials are available in the EC, and students are familiar with the EC operations at the respective distant sites. The facilitator performs the following strategies in support of EC coordinations: (a) establish liaison with origination site prior to the telecast to insure EC schedule is correct; (b) troubleshoot and manipulate the technology controls to turn the system on and connect to origination site; (c) coordinate with other sites to test audio/video controls with all distant sites connected to the telecast; (d) verify with the instructor that students have EC student guides, handouts materials; and (e) maintain contact with origination and distant sites during telelecture break periods.

Summary

      This section outlined a list of core factors pertinent to the development of a DL manual intended to support the roles, duties, and responsibilities of the EC program/training managers, faculty, and site facilitiators. These ten factors identify the core components essential to the implementation and quality operations in the EC.   This outline provides a framework to develop a more thorough DL manual for use by training and DL program managers, faculty, and site facilitators. This framework is important in an effort to help clarify the contextual setting in the two-way audio/video EC.

Recommendations

These recommendations have been developed as a result of the findings of this

case study. The recommendations are made to improve EC practice for the JMITC and

for those distant sites with electronic classrooms that use the JWICS network.

1. The faculty and facilitator should establish protocol procedures prior to the telecast to:

(a) identify procedures that will be used to solicit answers to questions when sites are

called on and (b) promote student and site participation to insure smooth interactions

among the distant sites. When students speak up simultaneously in the EC due the design

of the JMITC EC network, it adversely affects the audio quality and increase distractions

in the EC.

2. JMITC's leadership and management teams should aggressively establish priorities to

motivate faculty to be creative and explore technological ways of delivering instruction as

we move into 21st Century which will continue to be laden with information as well as

instructional technologies.

3. JMITC's management should provide faculty with full-time technical and

administrative support to include instructional designers and/or contract support to help

reconfigure and design EC courses, student guides, and course materials.

4. The EC program manager should ensure that the instructor's short biography and

teaching experiences are included in the student guide to help introduce students to the

instructor prior to the telecast. The analysis of this study revealed that knowing

something about the instructor can possibly reduce the student's anxiety and promote interaction and satisfaction in the EC.

5. JMITC's leadership and management team should establish a faculty-Command-Service School "team" to do long-range strategic planning for EC courses to consider customer requirements, marketing strategies, resource sharing to maximize EC offerings to meet the needs of consumers. This team should be chaired by a champion of DL and technology-based training to build momentum and expand support for the EC program.

6. The training/program manager should ensure upgrades to the technology in the EC; install computer generated graphics capability in the JMITC EC. This will promote consistent audio and visual quality of graphics and lessen the telecommunications static the students experience when the instructor transmits graphics and visuals.

7. The JMITC leadership and the program manager should allocate (program) funds and insure comprehensive staff development training for support staff, faculty, and site facilitators. Require EC personnel to enroll in annual refresher training, either performance based by using the EC facility or through formal training, to keep current with the technology changes and upgrades to the facility.

8. The JMITC program manager establish a semi annual teleconference workshop for program managers, faculty, and facilitators to: (a) get updates on EC technology, (b) experience being recipients in the EC environment, and (c) practice protocol to determine what procedures work best to improve EC operations.

9. The JMITC training manager establish a system to draw on the expertise of faculty who have taught courses over the JWICS network as champions to encourage use of the system and to train other faculty who might be interested in DL teaching.

10. The JMITC training manager lead a corporate team (leadership, faculty, Commands, Service School representatives) to develop a comprehensive evaluation plan and procedures to ensure the effectiveness and continuous improvement in the DL EC program. Use results of program evaluations to make improvements and communicate with customers the expectations and outcomes of an effective program.

11. Training managers at the distant sites appoint SME as facilitators when possible. This could possibly improve student interactions as it did with the SOUTHCOM facilitator in this case study. Additionally, in case of audio, video, or telecommunications failure the SME could continue the instruction and facilitate continuous learning using the activities in the contingency plans found in the supplement section of the student guidebook.

Summary

This case study research explored the factors and strategies that contribute to the implementation of DL in the EC. The case study identified ten key factors important to the implementation of DL. Notably, one of the key findings of this study was that the roles of the instructor and the facilitator are interwoven because they depend on the other to operationalize DL in the EC, a two-person team that operationalizes DL in the EC. This new paradigm shift is noticeably different when compared to the traditional classroom

setting. This noted key finding begs for further explanation and clarification.

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Focus Group Interview Questions (FGI), April 22, 1997

Domains	Questions
General	1. What was your first impression of the two-way audio/video method of DL? 2. What features didn't you like about your DL experience?
Instructional Strategies	3. What were the teaching strategies and/or aids that were helpful to you? Describe the type of techniques or strategies used by the instructor in the DL two-way A/V electronic environment that promote quality and success. 4. What are the techniques and strategies that you would recommend for this type of DL environment?
Types of Curriculum	5. What courses do you think are more suited to this type of delivery method? 6. Why do you think the courses you selected are most suited for the medium of instruction?
Staff Development	7. What types of faculty training is needed to teach in this DL environment?
Interaction and Involvement	8. What techniques and/or interaction strategies are more effective in this type of DL environment? 9. How often should interaction take place in the this type of DL setting within a 50-60 min. period of time? 10. What are some of the behaviors that inhibit participation in the two-way video/audio DL environment? Site Facilitation
Site Facilitation	11. What is the role of the site facilitator at the distant location? 12. What type of training do you recommend for a facilitator in this type of DL environment?
Evaluation	13. What components in the DL environment that should be evaluated?

Appendix II

Observation Checklist, A/V DL Electronic Classroom

Strategies (the Plan) and Techniques (activities that support strategies)	Yes	No	Student: Reactions & Interactions	Consequences
PROTOCOL: Roll call of site(s) on the network				
Introduction/Greeting - Fieldtrip of electronic classroom - Overview of the hardware and how it work				
Explanation of procedures to be used during the telecast: Student questions - Student materials (guide, graphics, notetaking guides)				
TELELECTURE: - Course overview - Content review - Expectations and outcomes - Evaluation methods				
PARTICIPATIVE MEASURES: -Reading -Group discussion -Questioning **Breaks**				
INVOLVEMENT/INTERACTION - Questioning - Use of visual aids, graphics, illustrations - Student guide - Group/individual assignments - War stories - Technology				
SUMMARY OF TELECAST (LESSON) - Overview of telecast - Follow-up assignments or sessions				
SUPPORT FEATURES - Telephone - Fax - E-mail - Intelink - Internet				
DISTANT SITE(S) FACILITATION - Site facilitator coordination - Administrative: role call, distribution of student handouts, trouble shoot the system, etc.				
10. OTHER(s):				
References				

Electronic Classroom (EC) *Observations***, 28 MAY 1997**
Course: Indications & Warnings, NMITC, Dam Neck, VA

Strategies (Instruction Plan)	Techniques (ways of executing learning strategies) and a description of actions	Data Analysis	Consequences and Synthesis
Protocol			
TeleLecture			
Discussion			
Readings			
Simulation or scenarios (War stories)			
Fieldtrips			
Participative Activities			
Questioning			
Technology (hardware/audio/video)			
Media: Graphics			
Media: Illustrations			
Media: Student Guide			
References			
Factor(s)			
(1) Instructor			
(2) Facilitator			
(3) Involvement & Interaction			
(4) Planning Time			
(5) Student Guidebook			
(6) Contingency Plans			
(7) Evaluation			
(8) Technology (Hardware System)			
(9) Scheduling			
(10) Barriers (inhibitors)			
(11) Off-line Discussions			
(12) Courses Suited for VTT			
(13) References			
(14) EC Design			
(15) Augment Resident Training			
(16) Access to training			
(17) Cost Savings			
(18) Communicating with Other sites			
(19) Comparison,1st Set of VTT Courses, 95-96			
(20) Announce/Market EC			

Focus Group Interview Questions (FGI), May 28, 1997

Factors:Components	*Questions*
Protocol	1. What did the instructor do that caused you to be distracted or lose attention at the beginning of the beginning of the telecast?
Instructional Process	2. What were the effective strategies used by the instructor that got you involved and interested in the telecast lecture? 3. How did you feel when the instructor called on your site/location to answer a question? 4. Why did you feel that way?
Barriers	5. What were some of the barriers that inhibited transactions (interaction or responses) in the electronic classroom (EC) during the VTT session? 6. How did these barriers inhibit you?
Technology (audio/video)	7. What impacts did the technology (audio/video transitions) have on your own interactions, responses, and your off-line discussions at your particular location? In what way did the technology affect the learning process?
Participation	8. What was the value added when the instructor used the following involvement strategies? (a) Questioning/probing for an answer? (b) Technology transactions (master podium to whiteboard illustrations)? (c) Graphics/viewgraphs display? (d) Student guide/handouts in student material/references?
Facilitator's Role	9. In your particular case, what role does the facilitator (the person who operates the system and pass out student materials) play during the instructional process?
EC Training	10. What prior training to you think is necessary to be successful in the EC? (a) Instructor. (b) Facilitator. (c) Why is the training important?
Contingency Planning	11. What alternative backup plans or activities should be implemented in the event of system (hardware) failure (technical problems with audio and/or video)? Why is there a need for this type of planning? 12. Why do you think it is necessary to have contingency plans?
Evaluation	13. What components of the EC instructional process should be evaluated?
Scheduling	14. What role does scheduling play across the time zones in making distance learning accessible to intelligence community users? Why is this factor important?
General: Final words	15. What else would you like to share about your EC experiences?

JWICS Electronic Classroom Sites

Commands and Intelligence Service Schools

SOUTHCOM	Southern Command	Quarry Heights, Panama
ACOM	Atlantic Command	Norfolk, VA
	315th Training Squadron (SQ)	Goodfellow AFB, TX
SOCOM	Special Operations SQ.	MacDill AFB, FL
NMITC	Navy Marine Corps Intelligence Training Center	Dam Neck, VA
FITCPAC	Fleet Intelligence (Intel) Training Center (CTR)	San Diego, CA
CENTCOM	Central Command	MacDill AFB, FL
EUCOM	European Joint Analysis CTR	Stuggart, Germany
JMITC	Joint Military Intel Training Center	Washington, DC
PACOM	Pacific Command	Hawaii
STRATCOM	Strategic Command	Offutt AFB, NE
USAIC&FH	US Army Intel CTR	Ft. Huachuca, AZ
SPACECOM	Space Command	Peterson AFB, CO

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