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AN ANALYSIS OF THE INITIAL DECISION PROCESS OF ORGANIZING THE NAVY MEDICAL DEPARTMENT'S EXECUTIVE MANAGEMENT EDUCATION MODULE CONVERSION TO NETWORK-BASED INSTRUCTION

by

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This thesis examines the initial decision process of organizing to convert a course module from the Navy Medical Department Executive Management Education. The objective is to track and model the process used to integrate Network-Based Instruction technology into an existing traditional classroom course of instruction. This research include survey of Network-Based Instruction literature, and an assessment of the decision process involved. The goal is to capture the context of the key decisions made during the preliminary stage of an actual conversion project, analyze the effectiveness of the approach and if possible generate a model for future efforts.

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This thesis examines the initial decision process of organizing to convert a course module from the Navy Medical Department Executive Management Education. The objective is to track and model the process used to integrate Network-Based Instruction technology into an existing traditional classroom course of instruction. This research include survey of Network-Based Instruction literature, and an assessment of the decision process involved. The goal is to capture the context of the key decisions made during the preliminary stage of an actual conversion project, analyze the effectiveness of the approach and if possible generate a model for future efforts.

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I. INTRODUCTION

This research will examine the decision process behind the conversion of a course module from the Navy Medical Department Executive Management Education (EME) curriculum to Network Base Instruction (NBI). The objective is to track and model the process used to integrate NBI technology into an existing traditional classroom course of instruction. Research will include a survey of literature on NBI technology, and an assessment of the decision process involved. The goal is to capture the context of the key decisions made during the preliminary stage of an actual conversion project, analyze the effectiveness of the approach, and, if possible, generate a model for future conversion efforts.

A. RESEARCH QUESTIONS

Primary Research Question:

1. What process was used to transform the current EME module to a NBI version?

Subsidiary Research Questions:

1. Who were the stakeholders?
2. What was the perceived value of the conversion to NBI?
3. What were the significant resources and constraints on this conversion project?

B. SCOPE

The scope will include: (1) tracking the decision process in the preliminary stage of converting an existing EME course module to NBI, (2) evaluating the process of converting current EME course module to NBI, and (3) reviewing costs associated with changing the process. The thesis will conclude with a proposed template for the process of converting a course module to NBI.

C. METHODOLOGY

The methodology used in this thesis research consists of the following steps: (1) Conduct a literature search of applicable Department of Defense (DoD) instructions, notices, studies, command policies, books, magazine articles, and other information relevant to EME and NBI; (2) Conduct interviews with key players at the Bureau of Medicine and Surgery (BUMED), Naval Postgraduate School (NPS), and vendors; (3) Track and model the process used to integrate NBI technology into an existing EME course module; (4) Prepare an assessment of the decision process used to integrate NBI technology into EME course module, (5) Identify potential cost savings from changes to the existing process.

D. BENEFITS OF THE STUDY

This study will provide the information required to better manage the conversion process of an existing EME curriculum to NBI.

E. CHAPTER OUTLINE

Chapter I discusses the purpose, scope, methodology, and benefits of the study. Chapter II provides the background about the Congressional mandate, initial DoD and Navy administrative health care assessment, the NPS Executive Management Education Program, and EME Stakeholders. In addition, the chapter provides a literature review of Network Based Instruction. Chapter III describes the decision processes used in the conversion of an EME course module to NBI. Chapter IV presents an assessment of the decision process utilized. Chapter V provides conclusions and recommendations based on the analysis presented in Chapter IV.

II. BACKGROUND

A. CONGRESSIONAL MANDATE

The U.S. Congress, in 1992 and 1996, issued specific directions to the Department of Defense (DoD) concerning the preparation of officers to command military medical treatment facilities (MTF) and to serve as TRICARE lead agents or key members of the lead agent staff. This initiative continues today to meet its obligations in preparing those officers for their duties.

To direct an MTF in the fulfillment of its mission, the effective commander must possess a mixture of specific skills, knowledge, and experience. This mix produces competencies that vary with the education and life experiences of the individual. The need for specific competencies is particularly evident for MTF commanders, lead agents, and their key staff members, who must have both general management skills and a thorough understanding of the health care delivery process. Commanders must successfully manage the various types of complex organizations that exist in the DoD health care environment.

The commander of an MTF and the lead agent of a TRICARE region are in unique positions when compared to their civilian peers. In addition to having health care administration skills similar to those in the civilian sector, they must also fulfill military requirements. Military requirements include readiness preparation, deployment skills, support for war fighting, direction of joint military and civilian health care networks, and a number of other requirements. Therefore, the necessary skills and knowledge of an MTF commander or lead agent not only must match, but also must exceed, those of their civilian counterparts.

The specific needs of MTF commanders were emphasized by the DoD Appropriations Act of 1992, Section 8096, which stated: "None of the funds appropriated in this Act may be used to fill the commander's position at any military treatment facility with a health care professional unless the prospective candidate can demonstrate professional

administrative skills." Similarly, the 1996 Defense Authorization Act (Public Law 104-106, Title VII, Subtitle B, Section 715), which focuses on training in health care management and administration for TRICARE lead agents states:

> (a)PROVISIONS OF TRAINING. Not later than six months after the date of the enactment of this Act, the Secretary of Defense shall implement a professional educational program to provide appropriate training in health care management and administration.
>
> (1) to each commander of a military medical treatment facility of the DoD who is selected to serve as a lead agent to coordinate the delivery of health care by military and civilian providers under the TRICARE program; and
>
> (2) to appropriate members of the support staff of the treatment facility who will be responsible for daily operations of the TRICARE program.
>
> (b)REPORT ON IMPLEMENTATION. Not later than six months after the date of the enactment of this Act, the Secretary of Defense shall submit to Congress a report describing the professional educational program implemented pursuant to this section. [Ref. 1]

B. INITIAL DOD ASSESSMENTS

In December 1991, the Assistant Secretary of Defense, Health Affairs, in response to the 1992 Appropriations Act, convened a working group representing the Army, Air Force, Navy, and Coast Guard to review and identify professional administrative skills necessary for command of an MTF. The group reviewed several areas, including the operation of civilian and military hospitals, the responsibilities of senior leaders in both settings, service programs in place to prepare individuals for command, and civilian standards for successful leadership in a health care organization. They identified the skills and experience necessary for successful job performance, discussed alternatives, and determined documentation requirements. Additionally, they identified and described 34 competencies needed to command an MTF, along with suggested procedures for validating candidates' possession of these competencies during the command selection process. [Ref. 1]

C. THE NAVY INITIATIVE

The Navy's Bureau of Medicine and Surgery (BUMED), in partnership with the Naval Postgraduate School, has designed a program based on the competencies identified in the studies cited. The program, Executive Management Education (EME), is designed to meet the requirements of the Appropriation Act. The EME Program is being offered at different MTF sites and executive sessions at NPS, Monterey, California.

During extensive interviews and surveys at the Navy's major MTFs, senior Navy health care executives told NPS faculty what was important to manage their commands and where they saw themselves in terms of competency levels. This information provided the bases for designing the 49 education modules.

The modules are taught by full-time NPS graduate faculty at the Monterey campus or at MTF sites. The subject matter within the modules was created as a result of the need assessment. These modules are shorter than the courses in the health care management programs of several universities, which require one or two years of residency. Additional instructional areas that relate exclusively to managing Navy MTFs have been integrated into the program. [Ref. 2]

D. THE EXECUTIVE MANAGEMENT EDUCATION

The EME Program is designed to prepare medical department officers for executive medicine positions. The objectives of this educational program are 1) to refine a manager's administrative viewpoint, which considers the effects of any one decision on the organization, 2) to provide a thorough understanding of the precise tools associated with operations analysis and economic consequences of any decision, and 3) to illuminate the meaning of working in managed care and lead agency environments. These objectives aim to provide an executive with increased confidence in coping with both present and future military health care management.

E. STAKEHOLDERS

A stakeholder is any group that can affect or is affected by the achievement of an organization's objectives. [Ref. 3] To be a stakeholder means to have an interest in the process or outcome of the issue. Some stakeholders may want things to stay the same; some may favor small changes of various sorts; some may want radical change. There may be stakeholders who are not involved in any controversy or process, yet have an interest in the issue. Active stakeholders are organizations or groups or occasional individuals who seek to affect the current initiative because of some interest. Some of them may be public spirited or acting on behalf of others.

The EME initiative has six stakeholders, not all of whom are equally affected by or have a significant effect on the initiative. A stakeholder map is illustrated in Figure 1.

1. Commanding Officers and senior military personnel are the most significantly affected by this initiative. They are required to complete the EME curriculum in order to acquire the necessary proficiency and demonstrate professional administrative skills.

2. Congress is also an important stakeholder because they are the primary decision maker who issued a directive to the DoD concerning the required skills, knowledge, and experiences an MTF commander must possess.

3. Clearly, DoD, including the individual military services, has a major stake in this EME initiative. The DoD's position is that the training of senior medical personnel is vital for health care executives to achieve the necessary skills.

4. Professors who are experts in their respective fields comprise another group that can exert influence. The obvious impact of this initiative is that, as more medical officers go through this program, more professors are needed to teach the required skills.

5. BUMED has a direct impact on the EME initiative. They are involved in the design and funding of the EME program based on the competencies identified.

6. NPS Institute for Defense Education and Analysis (IDEA) is charge with the development, delivery and management of EME programs.

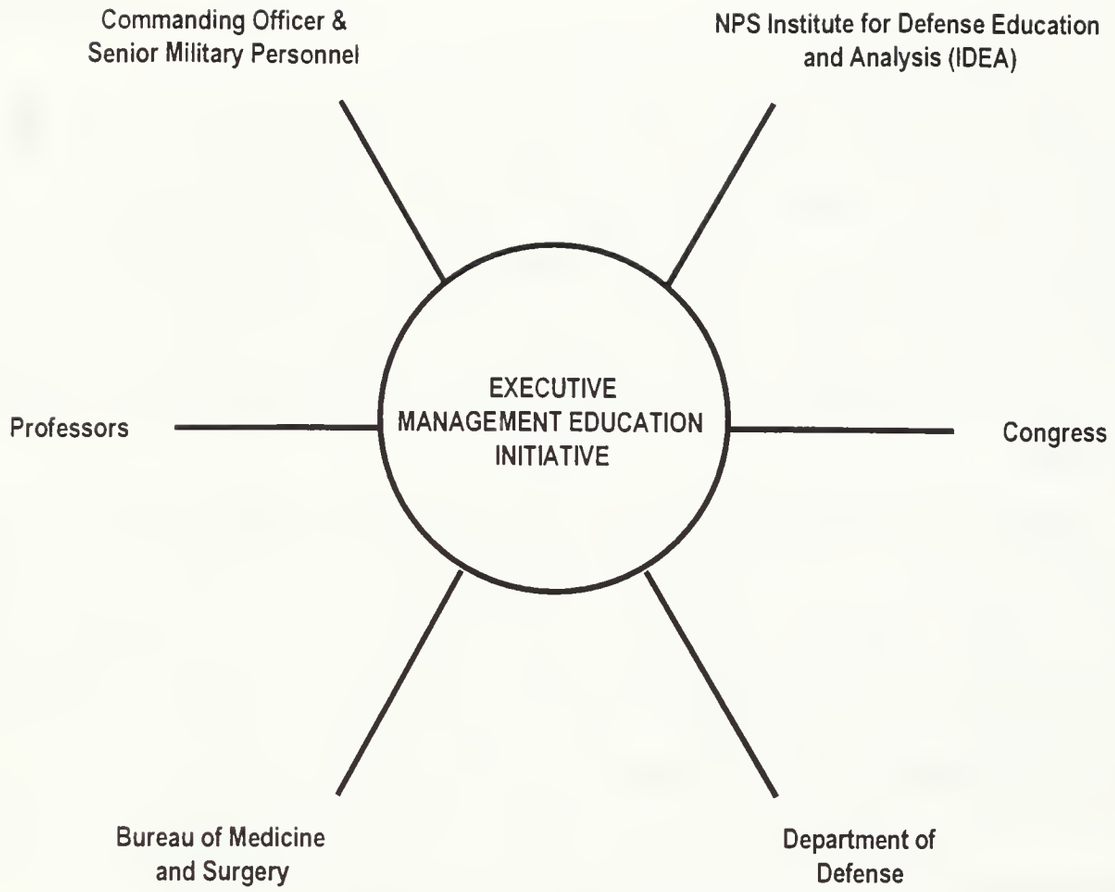

Figure 1. A Stakeholder Map

F. DISTANCE LEARNING

In today's world, continuous learning has become essential for effective military and health care leaders. Technology is quickly strengthening our ability to respond to that need, with distance education emerging as a timely and potentially cost-effective way to provide educational opportunities.

Non-traditional education is increasingly identified with distance education or education taking place beyond the physical spaces (campuses) traditionally set aside for such learning. At its most basic level, distance education takes place when instructor and student(s) are separated by physical distance, and technology is used to bridge the gap. These types of programs can provide various educational opportunities to students,

including executives in both the public and private sectors, particularly those disadvantaged by limited time, travel budgets, or physical disability. [Ref. 4]

Distance education has always benefited from the development of communications. There are a number of current distance learning technologies available, such as microwave broadcasts of both audio and video, videoteleconferencing, and Network Based Instruction.

The microwave broadcast classroom normally contains a single camera, which concentrates on the instructor, on an experiment, or on the blackboards where notes are being written.

Videoteleconferencing is an interactive distance learning setup using the t-1 phone line, which provides two-way audio and video between the broadcast and remote classrooms. Major universities and school districts throughout the country are now wired for the Integrated Services Digital Network (ISDN), which uses compression technology to transmit voice, video, and data simultaneously over standard telephone lines. [Ref. 5]

The most recent distance learning medium of learning and teaching is Network Based Instruction (NBI). This innovative approach for delivering instruction to remote audience is accomplished by using the Web. Public and private organizations like DoD, colleges and universities; corporations like IBM, Microsoft, and others are investing resources in developing these new training modalities. They expect an increase in Web-based training within the next few years. [Ref. 5] Organizations, NPS among them, whose customers are limited by cost and time constraints will require the flexibility that Web-based training can provide. NPS launched three Web-based educational programs in 1997 and plans additional online programming for EME this year.

G. NETWORK-BASED INSTRUCTION

Network-Based Instruction is defined as a hypermedia-based instructional program, which utilizes the attributes and resources of the World Wide Web to create a meaningful environment where learning is fostered and supported. [Ref. 6]

1. Origins

The Internet began as a project by the Defense Advance Research Project Agency (DARPA), whose goal was to develop a highly decentralized network that could both route information and survive a nuclear war or natural disasters. The resulting network was originally used for sharing information between research laboratories and researchers at educational institutions. Eventually, more and more students began to use the network, and when companies joined in as well, complete with advertising, the Internet was born.

One of the earliest uses of the Internet was for electronic mail. Long before the World Wide Web (WWW) and Web pages, the net was used for conducting searches and finding and downloading files and programs (FTP). Another early use was the Usenet, used by news groups, which was developed in part to deal with the heavy volume of e-mail generated by list servers. The hypertext transfer protocol (http) was developed in the summer of 1991 at European Particle Physics Laboratory in Geneva, Switzerland as a way to share research papers, and the first Web pages were created. [Ref. 7]

2. Why Network-Based Instruction?

The use of the WWW is growing exponentially. Estimates range from an increase of six percent to one of 20 percent per month. In January of 1991, there were 365,000 hosts. In January of 1996, there were 9,472,000 hosts. [Ref. 6] In addition to user traffic, the creation of the Web servers, home pages, and other digital resources on the Web is similarly expanding. This increase represents a tremendous potential for educators. [Ref. 8]

The WWW and the associated use of hypertext approaches have created new opportunities. Over the last year, a number of universities experimented with and started to use the Internet to support teaching and administration. Harvard Business School is offering executive education via the Web. The use of Web to support part-time MBA was seen as high potential, as evidenced by the University of Virginia offering Executive MBA for part-time students. [Ref. 9]

One success story in providing higher education through NBI is the University of Phoenix, a no frills university, with no laboratories, gymnasiums, and dormitories. They have 58 campuses in 12 states, Puerto Rico, and dozens of foreign countries. As of December 1997, they have an enrollment of 42,000, and are still growing at 20 percent a year. This institution provides continuing education, bachelor and master degree programs mostly in business and information technology to adults who work full-time and attend classes only at night or online. Their online students can complete their university studies from virtually anywhere in the world. [Ref. 10]

NBI is particularly applicable for MBA and executive education courses, just like the EME courses for senior DoD medical personnel. Students can enroll and participate in these on-line courses by using the Intranet applications. Intranets are internal Web systems that work in conjunction with the Internet and WWW. They enable students or employees to access school or company information with appropriate passwords.

The military has adapted to changing technology in providing training and education via the Web. One example is the Defense Systems Agency Information Training Facility, located in Falls Church, Virginia, which has developed and distributed Information Security Training Courses to various Information Security agencies via the Web. [Ref. 11]

The Services accomplish most of their training of individuals in residential school settings. For several thousand courses, the Services bear the travel and temporary duty (TDY) costs needed to support students in centralized training facilities. This practice affects service operations, unit performance, and quality of life for individuals whose work schedule and family responsibilities are interrupted by travel to distant training locations. These factors have motivated the Services to look for alternatives to centralized training facilities. Currently, the need to identify acceptable alternatives like NBI is increasing because: (1) budget pressures are reducing funds to operate centralized schools; and (2) with modernization and technology enhancements that increase the complexity of military equipment and support systems, training demands are increasing. [Ref. 12]

The Naval Postgraduate School, through IDEA as the technology leader within DoD for adapting new technology to education, started the process of converting EME modules to NBI. This initiative will provide opportunity for anytime, anywhere EME education on demand in both synchronous and asynchronous environments. Synchronous instruction requires the simultaneous participation of all students and instructors, and the interaction is done in real time. Asynchronous instruction does not require the simultaneous participation of all students and instructors. They do not need to gather together in the same location at the same time.

As an instructional technology, the Web has the ability to carry a variety of media from virtually anywhere, well beyond the traditional means. With access to course information and instruction on a flexible schedule through telecommunications, students can work at their own pace and to have more time to compose responses. They can learn the coursework at home or work, wherever and whenever Internet access is available. [Ref. 13]

3. Educational Uses of the Internet

As indicated earlier, NBI is a form of distance learning in which course modules are posted on the WWW. Individuals with access can log on and connect to the courses at their convenience. Presentations on the Internet allow for multiple media types, including text, sound, graphics and videos. Finding information on the Internet was made easy through the use of hypertext and hypermedia, providing links to a new page with related information.

The Internet itself is not interactive. It can be used in many ways that vary from passive reading, like a library book, to user driven simulations that change direction based on choices made by the user, like the video game model. Depending on the instructor's time, resources, and imagination, the Web and the rest of the Internet can be used in minimally, moderately, or highly interactive ways. Interactivity is a medium's ability for senders and receivers to notice and respond to each other's communication cues.

a. Minimally Interactive Use of the Internet

Minimally interactive use of Internet is the lowest level of interactivity. There is a limited or no interaction between the student, instructor, or expert at the distant locations. Listed below are several examples of minimally interactive uses.

(1) Research Tools. The Web offers many kinds of research tools. Search engines, government data sites, sites by subject-matter experts, and professional resources are just as few. Examples are sites by National Aeronautics Administration, United States Geological Survey, and other agencies.

(2) Syllabus Assignment Listings. This is the simplest and least interactive use of the course Web page. Provided are a copy of the course syllabus, assignments, contact information, perhaps a photograph of the professor and a short biography, if desired. The syllabus can be updated as often as necessary to keep it current. A list of discussion questions could be added so those students could keep them in mind while reviewing the last class or preparing for the next. This kind of page is fairly easy to create and maintain with minimum effort.

b. Moderately Interactive Use of the Internet

Moderately interactive use of Internet has a conservative degree of interactivity between the student, instructor, or expert at the distant locations. Instructors and experts may act as facilitators; and they can provide support, feedback, and guidance mostly via asynchronous communication, like e-mail, which allows for time-independent interaction.

(1) Newsgroup-like Discussion Groups. Discussion groups can be set up so that the professor can post questions for the students to discuss via e-mail. Each response is sent to a server which publishes the message in a list for other students to view. These groups can be made private so that only students enrolled in the course has access to the lists. If large classes make in-class discussions impractical or if anonymous discussion is desired, then a Web-based group discussion may be a useful addition to a course Web site.

(2) Online Chat Sessions. These sessions occur in real time, which means that as long as at least two people are logged in, a live discussion can take place. When one participant types a message, all other participants see the message at once. These sessions can be embedded directly in a Web page or accessed with special software designed for the purpose.

(3) Quizzes, Surveys and Appointment Books. Forms can be added to a Web site with a little effort. An example of a form is a quiz that each student fills out and submits electronically. It can be e-mailed to the professor, automatically graded, and added to the database of that student's work.

c. Highly Interactive Uses of Internet

Highly interactivity use of the Internet occurs when NBI students can interact with each other, with instructors, and on-line resources in real time. Instructors and experts may act as facilitators. They can provide support, feedback, and guidance via synchronous communication, like conferencing tools, which allows for live interaction.

(1) Real Time Interaction With Others. Real time interaction can be done on the Web in several ways. One is to have a link that opens another application, which makes a connection with a server. Two types of real time interaction, which are accessed this way, are Internet Relay Chat (IRC) and Multi User Object Oriented (MOO). IRC and MOO allow virtual gathering of students and teachers from around the globe at a set time to discuss a set of topics.

As technical advances make resources more accessible, the Web will be a viable medium to facilitate learning. NBI has the ability to provide a learning environment that is global and interactive. This technology can make it easier and quicker for organizations to train and educate their personnel anytime and anywhere. [Ref. 6]

4. Learning Styles

Distance learning may extend access to learning opportunities to students who otherwise might not be served. However, options that merely replicate the problems and

failures of the conventional classroom will not benefit students. To create options that enhance learning, we must consider different learning styles in the context of distance learning.

A Web-based environment can accommodate flexibility in learning styles. The way an individual learner reacts to the overall learning environment makes up his or her learning style. No universally accepted terminology exists to describe learning style and its various components; however, that people react to their learning environment is a core concept. James and Blank (1993) define learning style as the complex manner in which learners most efficiently and effectively perceive, process, store, and recall what they are attempting to learn. [Ref. 14] Learning style has three distinct but interconnected dimensions: the perceptual (physiological or sensory) mode, the cognitive (mental or information processing) mode, and the affective (emotional or personality characteristic) mode.[Ref. 5]

a. Perceptual dimension

Perceptual dimension identifies the way individuals assimilate information. It involves the body's biological response to external stimuli, including input through physiological factors such as speech, movement and any of the five senses. This dimension depends on the physical ability of an individual's body to integrate information into the brain. It is the means through which the information is extracted from the environment

b. Cognitive dimension

The cognitive dimension includes the storage and retrieval of information in the brain. Information-processing habits represent the learner's typical way of perceiving, thinking, problem solving, and remembering. Each learner has preferred avenues of perception, organization, and retention that are distinctive and consistent.

c. Affective dimension

Affective dimension encompasses aspects of personality that relate to attention, emotion, and valuing. Affective learning styles are the learner's typical mode of arousing, directing, and sustaining behavior. Although the components of the affective

learning style cannot be observed directly, they can be inferred from the learner's behavior and interaction with the environment.

For the instructor developing a Web-based course, the challenge is to analyze the learning style characteristics of the group and develop modes of instruction that fit those characteristics. Unfortunately, instructors are only able to identify a few elements of their students' learning styles through observation. Consequently, instructors should adapt instruction to the variety of ways individuals learn by developing and planning various tasks that cater to various learning styles.

Learning grows out of what interests the learner. The Web offers an excellent environment to support a number of learning style differences. Faculty can create a learning environment that challenges each style of student to pursue a topic further and gather different perspectives on issues. [Ref. 5]

5. Cost Effectiveness

The conversion of EME modules from traditional classrooms to NBI requires a large investment. Conversion requires an investment up front while resident training programs continue; payback, in the form of travel and per diem cost savings, begins as NBI comes online and replaces resident courses. Such an investment is difficult to defend without considering the costs and benefits of converting EME modules to NBI.

Two of the greatest potential benefits are increased training effectiveness and the saving of travel and per diem costs for resident training. Training effectiveness is a complex outcome measure. It includes the ability of NBI to provide at least the same amount of knowledge and as well-educated of a learner compared to the traditional classroom, quicker ability to update course materials, and increase throughput of the number of students. [Ref. 12]

A Naval officer thesis study on Cost Effectiveness Analysis of Converting a Classroom Course to a Network Based Instruction determined that converting only two EME modules to NBI was not cost-effective. [Ref. 15] The conversion of more modules, however, could generate cost savings.

Modules presented during the first week of EME conference were of varying length with some modules lasting for two, three or four hours. On the second and the third weeks of the EME conference, each day was broken into two, 4-hour course modules with one module in the morning and the second in the afternoon. The study was based on the use of two, 4-hour modules per day. If two modules are converted, one fewer EME conference day is required and its costs are eliminated. The cost per student to present one EME conference is $13, 348.37. The total cost per student actually increases for each module converted to NBI, until four EME conferences have been held. Only when 20 modules are converted to NBI, and four EME conferences have been held will the cost per student for an EME conference with converted modules become lower than the cost per student for an EME conference without converted modules. However, the savings are minor at $142.22 per student. Obviously as the number of converted module increases, the conference length in days decreases, thus decreasing the conference room costs, opportunity cost of student salaries, and per diem costs. There is a greater saving after the conversion of the 20th module, since weekend travel costs are eliminated. The savings continue to increase for each even number of modules that are converted. If all modules are converted, a savings of $1,234.12 per student is realized. [Ref. 15]

Stanford Technologies Group, one of the contractors currently transforming an EME module to NBI, conducted an Economic Analysis of Training Alternatives consisting of three cases: (1) on-the job with the instructor traveling to the student and with no student travel; (2) NBI provided to the student, no travel involved; and (3) centralized classroom, both students and instructors travel. Based on their study, the total cost of training strategy case number two, based on 1,000 students, is $270,000, or $270.00 per student. NBI instruction is $143,600.00 less expensive compared to case one and $280,000.87 less expensive compared to case three. Figure 2 shows the results of the economic analysis of training alternatives.

Economic Analysis of Training Alternatives

Notes for using this worksheet:
(a) Update the grey fields as needed for each business case
(b) Number of trips MUST be manually updated
(c) Travel cost per instructor should consider the possibility of multiple training sessions, back-to-back, at one training site
(d) CBT usually teaches the same content in 50-75% of the time required for classroom, instructor-led training
(e) Do not overlook packaging and shipping costs for student training materials

	Case #1	Case #2	Case #3
	On-the-job with instructor travelling to the student. No student travel	IBT provided to the student. No travel involved	Centralized classroom. Both students and instructor may travel.
Student-Related Expenses			
Number of Students	1000	1000	1000
# Students per Class	4	1	12
# Training Sessions Needed	250	1000	83.33
Length of Training Session (in hours)	8	5	8
Travel Time to/from Training per Student (in hours)	0	0	6
Student Salary per Hour	$20.00	$20.00	$20.00
Total Cost of Student Salaries	$160,000.00	$100,000.00	$280,000.00
# of Trips for Students to the Training Site (total)	0	0	1,000
Travel Cost per Student (including travel, food & lodging)	$0.00	$0.00	$50.00
Total Cost of Student Travel	$0.00	$0.00	$50,000.00
Total Student-Related Expenses	$160,000.00	$100,000.00	$330,000.00
Instructor-Related Expenses			
# Training Sessions	250	1000	83.33
Length of Training Session (in hours)	8	5	8
# Instructors per Training Session	1	0	2
Initial Instructor Prep Time (per instructor, in hours, not inc. material	40	0	40
Instructor Preparatory Time per Session (per instructor, in hours)	2	0	4
Instructor Salary per Hour	$40.00	$40.00	$40.00
Travel Time to/from Training Site per Instructor (in hours)	8	0	8
Total Cost of Instructor Salary	$181,600.00	$0.00	$136,533.33
# of Trips per Instructor to the Training Sites (total)	100	100	40
Travel Cost per Trip per Instructor (including travel, food & lodging	$500.00	$0.00	$200.00
Total Cost of Instructor Travel	$50,000.00	$0.00	$16,000.00
Total Instructor-Related Expenses	$231,600.00	$0.00	$152,533.33
Other Related Expenses			
# Training Sessions Needed	250.00	1000.00	83.33
Cost of Classroom per Session	$0.00	$0.00	$250.00
Total Cost of Classrooms	$0.00	$0.00	$20,833.33
Cost of Equipment per Student	$0.00	$0.00	$25.00
# Students	1000	1000	1000
Total Cost of Equipment	0	0	25000
Sunk Cost to Develop Student Materials (Workbooks, CBT, etc.)	$10,000.00	$150,000.00	$10,000.00
Cost per Student for Materials (Copies, Replication, Shipping, etc.)	$12.00	$20.00	$12.00
Total Cost of Student Materials	$22,000.00	$170,000.00	$22,000.00
Total Other Related Expenses	$22,000.00	$170,000.00	$67,833.33
Summary of Costs			
Total Student-Related Expenses	$160,000.00	$100,000.00	$330,000.00
Total Instructor-Related Expenses	$231,600.00	$0.00	$152,533.33
Total Other Related Expenses	$22,000.00	$170,000.00	$67,833.33
Total Cost of Training Strategy	$413,600.00	$270,000.00	$550,366.67
# Students	1000	1000	1000
Cost per Student	$413.60	$270.00	$550.37

Figure 2. Economic Analysis of Training Alternatives

Although the sample analysis conducted by Stanford is completely constructive, just bear in mind that the data used were only approximate. One example is the data they used

for instructor's salary, which is $40.00 per hour, while the instructor's at NPS may be as high as $300.00 per hour. The $270,000 total training cost for case two is really coming from the sunk cost of $150,000 that is used to develop student course materials. The question is, What are they getting with this $150,000? If they will get an engaging, robust distributive learning module, then the answer may be yes. However, if they will get a totally asynchronous text page turning module, even when the dollar value per student is down that may not be the correct pedagogy. Everything must be taken into consideration when evaluating alternatives. If they are just looking to reduce cost as their bottom line, then they will look for the cheapest way to get the learning out to the students. The resulting product may not be good, their credibility goes down, and learners are not getting the required education. However, if they are looking for the quality of education, they may be willing to spend the same amount of money per student and be able to provide to twice as much the number of students.

H. SUMMARY

As the Information Age evolves and technical advances make resources more accessible, NBI is becoming a more viable medium to facilitate learning. Several organizations, including the DoD, schools, and private companies have adapted to this changing technology. NBI make it easier and quicker for organizations to train and educate their personnel anytime and anywhere. However, conversion of EME modules to NBI requires a large investment up-front. Conversion of more modules will reduce the number of training days, resulting in greater savings. The potential benefits are increased education or training effectiveness and savings of travel and per diem costs for resident training.

III. DECISION PROCESSES IN THE CONVERSION

A. INTRODUCTION

This chapter describes the initial decision process used in the conversion of an EME module to NBI. The focus will be on the criteria used by IDEA in the selection of modules, instructors, and contractors.

This pilot project, the first time that an EME module will be converted to NBI, seeks to improve the current process so that future conversion of modules will be more effective.

1. Background

The Naval School of Health and Sciences (NSHS) is a BUMED command in charge of the management of the EME Program. The Institute for Defense Education and Analysis (IDEA), a department within the office of the Associate Provost for Innovation, is the designated coordinator of the EME Program.

On April 30, 1997, IDEA submitted a proposal to study, implement, and evaluate distance learning applications for EME to the Commanding Officer, NSHS. This proposal included empirical research, modular conversions, measure of effectiveness and delivery of the plan. [Ref. 16] When it submitted this proposal, IDEA had no established criteria for the selection of modules, instructors, and vendors for the conversion to NBI.

2. Institute for Defense Education and Analysis (IDEA)

IDEA is charged with developing strategic partnerships with select universities, government agencies, and private organizations to foster a mutually supportive environment for innovative collaboration in the design, creation, and implementation of an effective distributed learning systems.

a. Mission

IDEA's mission is to identify, develop, market, and manage innovative programs of applied research, consultation, and teaching, including non-residential executive and continuing programs, on a cost-reimbursable basis, in support of the DoD requirements.

IDEA's educational programs are designed to conform with the NPS resident Graduate Curricula. They contribute to NPS faculty/student development, instruction, and research and build upon the NPS core mission. The NPS mission is to increase the combat effectiveness of United States and Allied armed forces and enhance the security of the United States of America through advanced education and research programs focused on the technical, analytical, and managerial tools needed to confront defense-related challenges. IDEA's programs contribute to educational and training innovation, including distance/distributed learning and non-traditional educational methods.

b. Organization

The Associate Provost for Innovation serves as the Director of IDEA. Currently, three organizational subdivisions and two centers support IDEA's mission: Education, Applied Research, and Consultative Services; and The Center for Acquisition Education, Training, and Research and the Naval Center for Acquisition for Education. Figure 3 shows IDEA's organizational structure. Its staff consists of NPS professors and civilian professionals who are experts in their fields. Currently, IDEA has limited programming capability, and has no immediate plans to establish an in-house development capability.

c. Core Competencies

IDEA's core competencies include: (1) development and delivery of executive education programs; (2) distributed learning /network-based instruction course conversion and development; (3) consulting and applied research program development and support; (4) program and project management; (5) conference coordination and

logistics support; and (6) survey development and execution, both automated and traditional solutions.

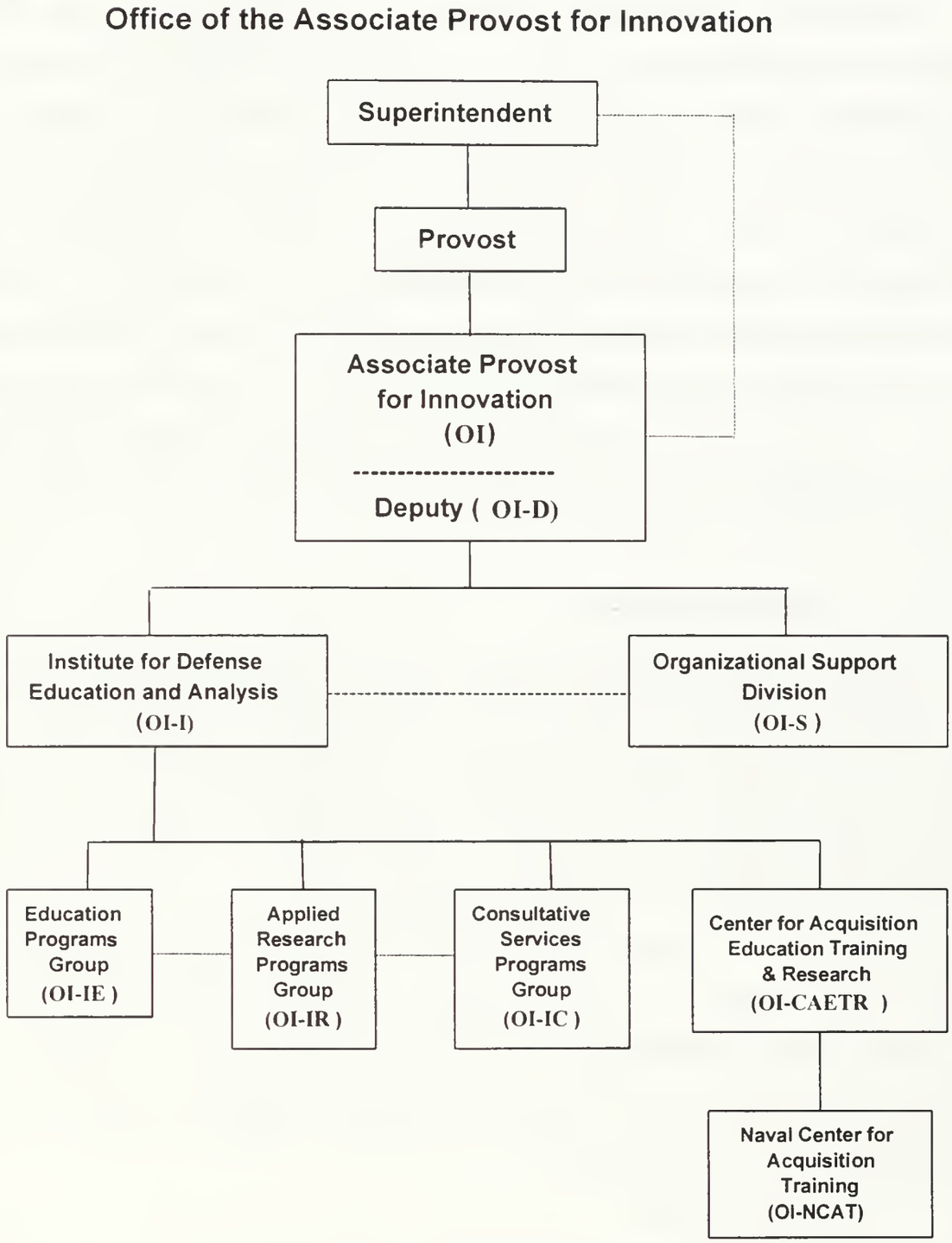

Figure 3. IDEA's Organizational Structure

B. NBI MODULE SELECTION PROCESS

The selection process for the selection of modules, instructors, and vendors starts with the Distributive Learning Team. The team is made up of four to five members, who are faculty and staff members of NPS. Their responsibility includes: (1) oversee and manage the delivery of residential and distributed graduate education, (2) create or adapt content to new distributed learning pedagogies, (3) explore new instructional system technologies to foster collaborative learning environments (synchronous and asynchronous), (3) provide analysis in determining course/class attributes, (4) facilitate customer support/interface between facilities, contractors, and subject matter experts, and (5) conduct cost-benefit analysis of alternatives. The team will identify and evaluate the soundness of alternative choices for module, instructor and contractor selection, and submit their recommendation to the Director and Executive Director of IDEA for the final decision. [Ref. 17]

1. Proposal Development

The initial decision process to convert current EME modules to NBI started when IDEA submitted its proposal to NSHS. This proposal laid out the deliverables, which focused on two distance-learning alternatives: video teleducation (VTE) and NBI interactive remote learning. Also explained were the contents, methodology, strategy and budget requirements for these deliverables. [Ref. 16]

The proposal to convert EME modules to NBI was approved and funded by BUMED for $2.5 million. This funding includes traditional classroom instruction and conversion of modules to NBI and VTE. [Ref. 18] The Distributive Learning Team, formed to jump-start this initiative, was given the task of selecting modules, instructors, and vendors to start the conversion process.

2. Module selection

Different EME modules have different module content. The two modules selected for the pilot study were Module 24 (Budgeting for Defense Health) and Module 51

(Medical Readiness). According to the Executive Director of IDEA, "Those two modules were selected because they are tightly developed, well written and organized. Also, the modules lasted only for a short period of time, no more than four hours." [Ref. 17] The EME Program Coordinator of IDEA said that, "One of the criteria that was used was the study conducted by Crawford and Suchan, "Media Selection in Graduate Education." [Ref. 19] Although NBI was not included in Crawford and Suchan's media selection study, according to the author, VTE's use of 50 percent or more on Know and Supply Information and Apply Information to Structured Process Learning Outcomes can be apply to NBI's. Also, according to the survey Crawford and Suchan conducted, those two modules do not require interpersonally complex interaction to attain their learning outcome, which made them excellent candidates for conversion to NBI. [Ref. 20]

Many see the WWW as the next great alternative to traditional instruction. According to Romiszowski, "Given recent developments in telecommunications technology, NBI can replicate virtually, all the key learning activities that occur in traditional classroom-based courses." [Ref. 21] Although EME modules can be converted to NBI, the question is how well can they be converted? Those that require a significant amount of personal live interaction may be extremely difficult to transform to NBI. While there are limitations, as with other distance education technologies in the degree to which it can replicate traditional instructional events, NBI can be an enhancement over traditional classroom-based and distance education environments.

3. Instructor Selection

Selection of the most qualified professor is very important for the success of this pilot program since he or she will provide the course content of the module. Although there are many excellent professors at NPS, Professor Doyle was selected to convert his modules to NBI based on his reputation and accomplishments. He was the 1996 recipient of the prestigious RADM John J. Schieffelin Award for excellence in teaching. Well respected by students, staff, and faculty, he is also motivated and open to new instructional design ideas.

In addition, he is computer literate, especially comfortable with the use of Power Point for presentations. [Ref.19]

4. Contractor Selection

To design Web-based courses, design teams are needed. The purpose of the design team is to unite a strong variety of experiences and perspectives, with the educational learning outcomes as the central impetus and innovative technologies such as NBI as the medium. The objective of the design team is to create educational content that is of the highest caliber and to deliver it using the most relevant technologies available. The design team is comprised of discipline-specific experts, Web-design professionals, program administrators, standards-based education consultants, and educational technologists. Currently, IDEA does not have a Web design team to transform modules to NBI. In order to accomplish this conversion, they needed to contract for a Web design team.

The Executive Director of IDEA stated, "We do not have an established criteria or decision process in the selection for contractor or vendor." This will be the first time that an EME course module will be transformed to NBI at NPS. The management of IDEA made the decision to convert two EME modules to NBI, with funding authorization from BUMED. One of their purposes for conducting this pilot study is to learn and establish criteria for selection of contractors, modules, instructors, and other requirements. Their goal is to learn how to effectively coordinate different NBI components and processes, which include the following: (1) content development, (2) multimedia components, (3) Internet tools, (4) computers and storage devices, (5) connections and service providers, (6) authoring programs, (7) servers, and (8) browsers and other applications. [Ref. 17]

IDEA started the contractor selection process by contacting approximately a dozen contractors to make a presentation or demonstration of their products. There were eight contractors who made presentations. Two contractors were selected, Stanford Technologies Group and Arista Systems, Incorporated, because they were able to demonstrate to IDEA management's satisfaction that they were capable of converting EME modules to NBI. [Ref. 17]

Stanford Technologies Group (STG), based in Washington D.C., was selected because of their prior military training development experience. However, because they do not have experience in developing courseware products, they established a partnership with Electronic Learning Facilitators (ELF), Inc. to provide computer services including analysis, design, and courseware for NBI modules to win the contract. The company demonstrated a NBI training module of how to play a woodwind instrument and conducted an Economic Analysis of Training Alternatives. Based on this work, they were assigned to do the conversion of Module-24, Budgeting for Defense Health. There was no specific reason why IDEA selected STG to transform Module-24; according to the Executive Director, IDEA, "We just want to assign a module to each vendor." [Ref. 17]

Arista Systems, Inc., the other contractor selected, is based in Monterey County. It has partnerships and alliances with California State University Monterey Bay, The Laurasian Institution, and Nousoft, Inc. Arista has experience with distance technology through its partnership with Lauratian Institution. To win the contract, they were able to show a course module via the Internet, titled "Doing Business in Japan." That was one of several modules that they had developed for the Asian Pacific Economic Countries sponsored by the Virtual University of Asia. Arista is also putting together an Accredix Platform Neutral Course Management System, which supports the delivery of instructional material and includes the management of network-based environment. Modules that are converted by other contractors can be used within this system. Another reason for Arista's selection was its Monterey location, making the company more accessible during the conversion. Arista was assigned to do Module 51, Medical Readiness.

C. SUMMARY

IDEA did not use a structured decision process or specific criteria to select modules, instructors, and contractors in the conversion of an EME module to NBI. Their goal was to learn from this pilot study and to establish criteria and a process for future conversion projects.

The next chapter will offer recommended criteria on the selection process and assess the decision process used by IDEA compared to other organizations.

IV. ASSESSMENT OF THE DECISION PROCESSES

A. INTRODUCTION

This chapter assesses the decision process used by IDEA in transforming an EME module to NBI and provides recommended criteria for the selection of module, instructor and vendor. It will also discuss processes used by other organizations in their conversion projects to serve as a model for the conversion process and provide insight on how to plan the conversion process.

B. THE DECISION PROCESS

The decision to develop and maintain a new instructional system, such as the conversion of EME modules to NBI, is a large undertaking. This undertaking should be based on a reasonable set of probable outcomes and/or benefits. IDEA management and the Distributive Learning Team, as the managers of this project, are entrusted with the challenge of planning for this kind of change. The new instructional system they implement must ensure that learners develop the new knowledge, skills, and attitudes required to meet program objectives. To meet program objectives, IDEA management and team members should use models such as the Instructional Systems Development Model to plan, develop, and deliver new systems to deliver educational and training programs.

1. Instructional Systems Development

Instructional Systems Development (ISD) procedures have had an impact on the way education and training programs are planned, developed and delivered. ISD has military beginnings. The landmark event in ISD was the Inter-service Procedures for Instructional Systems Development Project in 1975, which offered a model for using ISD in the military. The ISD model also influenced the development of educational and training programs in business and industrial settings. [Ref. 22] Although the ISD model is used

generally to systematically develop training programs, this model can be used profitably to develop new instructional technologies.

Principles of ISD are more applicable when the expected outcomes of the education or training can be clearly established, and the organization providing the education is held accountable for producing results. ISD projects flourish in organizations that place an economic value on the time of its learners.

ISD is not a remedy for all education and training problems; nor is it guaranteed to be equally effective in all situations. The purpose of ISD is to assist in fulfilling the requirements for the successful implementation of educational and training programs.

All ISD models have several things in common. First, they are process-oriented and not product-oriented. All too often, programs are implemented without a thorough analysis. This model will help the decision-makers to make the right decision in developing and managing educational programs. Second, the ISD approach is systematic and deliberately planned. Third, all ISD models have five stages, each with a similar name to describe a similar purpose. Fourth, output from one phase acts as input for the next. Finally, this process has built-in controls for review and required revision.

The intent of this ISD model is to present information about the process one goes through in developing instructional systems, rather than a fixed, step-by-step sequence of specific actions. This model will be used to assess the decision process used by IDEA and other organizations in the conversion of their courses and modules to NBI. The five stages of the ISD model are:

a. Analysis Phase

The process begins with the Analysis Phase, in which the educational or training needs of the different groups of students within the organization are analyzed. This phase, one of the most complex and time-consuming, begins with few or no assumptions about what education or training is required. This phase defines the problem, identifies the source of the problem, and determines possible solutions. The phase may include specific research techniques, such as need analysis, job analysis, and task analysis. The outputs of

this phase often include the instructional goals and a list of tasks to be taught. These outputs will serve as the inputs for the design phase.

b. Design Phase

The Design phase involves using the outputs from the analysis phase to plan the strategy for developing the instruction. This phase develops an outline for reaching the instructional goals determined during the analysis phase and expands on the instructional foundation. Objectives are developed and used to determine appropriate content and methods. Some of the elements of this phase may include writing a target population description, conducting a learning analysis, writing objectives and test items, and sequencing the instruction. The outputs of the Design phase will be inputs for the Development phase.

c. Development Phase

The Development phase builds on both the Analysis and the Design phases. The purpose of this phase is to generate the lesson plans and materials. This phase involves the development of the educational materials, which include the content the instructor will present, as well as other supporting materials. Designers often work closely with functional specialists who review and even write the first draft of the materials.

d. Implementation Phase

The Implementation phase refers to the actual delivery of the instruction, whether it is classroom-room based, lab-based, or computer-based. The purpose of this phase is the effective and efficient delivery of instruction. It generally begins with a pilot module, in which materials and methods are formatively evaluated before they are made ready for mass use. This phase must promote the students' understanding of material, support the students' mastery of objectives, and ensure the transfer of knowledge from the instructional setting to the job.

e. Evaluation Phase

The final evaluation phase assesses the training at the end of each presentation to determine whether the students have mastered the material and whether the instruction itself was appropriate. Evaluation should actually occur throughout the entire instructional design process, within phases, between phases, and after implementation. A second type of evaluation, which generally occurs some months after the training, is designed to follow up on the students' use of what they learned in order to determine overall program success.

The purpose of this five-stage process is to present a model that should be used and adjusted according to the users' unique environment and needs. Not everybody will use it the same way. Some may perform certain tasks simultaneously, or in less detail, or not at all.

This ISD model can be applied in the decision process to convert EME modules to NBI. This model can provide procedural frameworks for systematically making new instructional systems decisions. Part of this ISD process was used to determine the learning goals and content of the EME to be converted.

C. CREATING AN INITIAL DECISION MAKING PROCESS FOR NBI

Although there are five different phases in the ISD model, the scope of this study is the initial decision process, which occurs mainly in the Analysis phase. Figure 4 is a proposed initial decision process using the Analysis Phase of the ISD Model for conversion of EME modules to NBI. The five step process include: (1) identify the instructional goals; (2) conduct needs assessments; (3) establish criteria for module, instructor, and vendor selection; (4) select delivery systems, module, instructor, and vendor; and (5) plan the project. [Ref. 22]

The first step is the identification of goals. Usually, this is in response to educational and training needs. However, in this case, the goal is to convert traditional classroom EME modules to NBI.

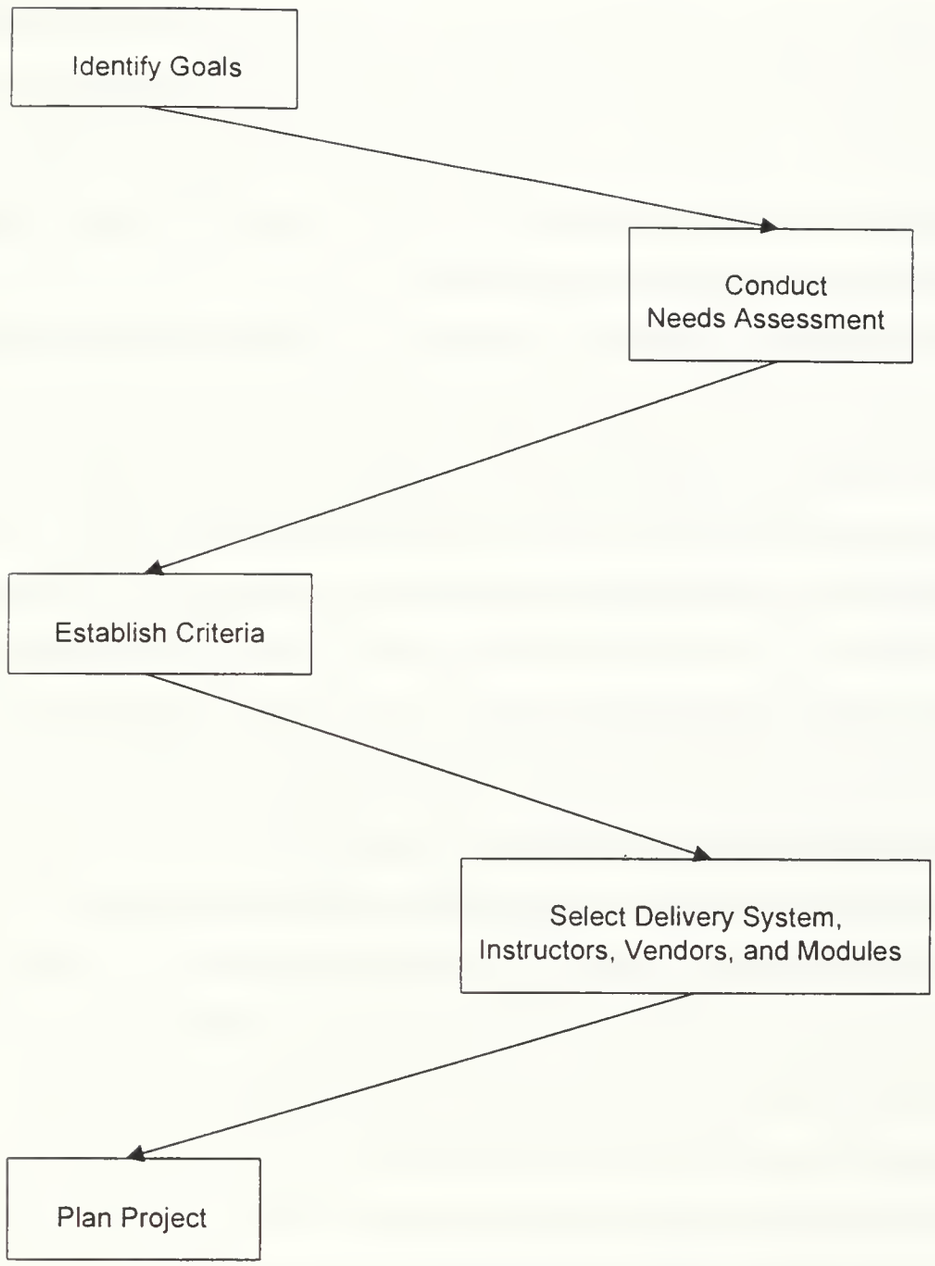

Figure 4. Proposed Initial Decision Process

The next step, conducting needs assessments, involves the identification, evaluation, and prioritization of educational and training needs to allow the development of the course. Part of this approach, the ability of the individuals or the team to meet performance expectations for a given job or task, is analyzed. It is important to emphasize that no two needs assessment are alike. Decisions and plans will vary with the nature of the goals and objectives of the organization.

The third step is establishing criteria for module, instructor, and vendor. One challenge for instructional designers is the task of suggesting the best criteria for designing NBI course modules. Presently, no "best criteria" for the design of NBI exist. The selection criteria for module, instructor, and vendor suggested here are based on the literature describing other organizations' processes.

In module selection, various factors must be considered in relation to the medium of instruction to be used. These include: type of content, number and location of students, time available, instructional budget, and facilities available. Matching module requirements to technology is a challenging task because of the many variables involved.

There are several commercial tools available to aid in module selection. One of these, the Advisor 2.0, is widely used and is a candidate for standardizing the process of media selection by the U.S. Air Force Education and Training Command. [Ref. 23] Also, this is one of the two media selection tools being considered by Chief of Naval Education and Training Command and is now being used by some Navy Training Commands, such as Fleet Training Center, San Diego. [Ref. 24] Dr. J. Bahlis, the author of this program, worked with the Air Force to produce a program that meets or exceeds Air Force requirements. [Ref. 25] Used in the support of the recommended process, Advisor is not only useful in media selection, but also helps organizations analyze costs, impact, and other issues associated with evaluating and choosing training. The Appendix is a summary of inputs used to generate a sample session created by the author. Though the sample course "Module 24" (Budgeting for Defense Health) is completely constructive, the corresponding EME course was kept in mind as the author followed Advisor through the step-by-step assessment of educational needs. What is immediately obvious is the programs format is conducive to using it as a structured interview tool. Bahlis groups the "interview" questions into four general areas, each covering a different aspect of what he calls "Factors that Impact Media Selection."

The "Regulations" section covers the policies and procedures that are fundamental to the course and course environment: Why does the course exist? Is the course subject

matter or material classified? What type of testing is required? The sample course was designed as a public domain course which would require the student to demonstrate skills and knowledge during testing.

The "Organizational" section helps describe the administrative environment of the course: How much time is available to develop the course? What assets are available to do so? It also extracts information about the course objectives, contents, and status. Consistency in delivery was important and a flexible delivery schedule was required.

The "Training" section of the interview investigates the students and the instructors. What are their backgrounds? Where are they located? Is it essential or just desirable for them to interact? Is the success of the course dependent on their ability to share experiences with one another.

The final part of the interview, "Instructional Needs," tries to capture what type of training environment can be expected: Are the students computer literate? Do they have access to PC's? The Internet? Can they travel to a VTT classroom or CBT center?

When the interview is complete, Advisor compares the requirements and matches them to currently available educational techniques. Advisor produces an "effectiveness" score, with 100 percent being an ideal choice. On demand, Advisor produces a list of reasons why each candidate technology is less than ideally suited for a particular course. In the sample case for example, Internet/Intranet scores 83 percent because of some deleterious environmental factors like student resistance to change. Understanding the logic underlying Advisor enables the user to manipulate the variables to generate alternative paths. In the sample, a print-based was rejected outright because one of the parameters selected was a requirement for audio. If the requirement for audio is negotiable, a correspondence solution path can be made feasible, with an effectiveness of 60 percent, by changing the value of the variable audio from "required" to "desired."

As discussed in Chapter III, the study conducted by Crawford and Suchan on "Media Selection in Graduate Education for Navy Medical Officers" demonstrates an approach for systematically selecting instructional media for specific learning applications

that places priority on the desired learning outcome and the media required to support the instructional techniques to attain that outcome. On this study, the media selection guidelines were used to match each module with VTE, digitized video disc (DVD), or traditional classroom instruction. [Ref. 20] This study can also be useful in conjunction with Advisor 2.0.

The fourth step is the establishment of selection criteria for the instructor. A critical part of the EME module conversion to NBI is the instructor. With the current technology, NBI can be designed so that the instructor plays the role of facilitator, coach, mentor, and guide. Instructors are guided by Web Design Team in specific methods and strategies for facilitating courses online.

To successfully facilitate an online course module, instructors must meet the following professional criteria: (1) appropriate content knowledge and experience; (2) competence with technologies required to deliver the course successfully--i.e., e-mail, real-time communications, group mailing lists; (3) ability to introduce and manage both synchronous and asynchronous communications and interactions; and (4) openness to emerging technologies and ways to apply them to online educational environments. [Ref. 26]

Vendor selection criteria are especially important for organizations that outsource their Web-Design Team. Most distance education programs in higher learning centers, such as NPS, do not necessarily have all the expertise to perform design and production tasks. The expertise lacking is most often in Web programming, multimedia authoring, and media conversion skills. A design team is needed to fulfill those requirements. Such a team is involved in the design and development of a Web-based module with the objectives of creating the highest-caliber educational content and delivering it with the most relevant technologies available. For some organizations, it is financially prudent to contract their conversion project out to qualified vendors.

To achieve the milestones of a Web-based initiative, the following requirements and criteria for vendor selection are suggested: (1) vendor quality as evidenced by work

samples; (2) vendor's price; (3) vendor's understanding of the subject matter; (4) vendor's ' experience in the actual conversion of course modules to NBI; (5) quality of the proposed solution; and (6) vendor's ' reliability and track record. [Ref. 27]

This fourth step, the selection of module, instructor, and vendors, must be based on the management and Distributive Learning Team's approved, established criteria.

Planning the start of the project is the fifth step, including establishing the timelines and resolving other issues based on the information generated from the above steps.

D. ASSESSMENT OF OTHER ORGANIZATIONS' PROCESSES

An assessment of the initial decision process used by two organizations, the University of Minnesota and Jefferson County Public School, will be discussed using the Initial Phase of the ISD Model. Its purpose is to point out the similarities and differences in the steps, issues, and constraints involved in their decision process as compared to IDEA's decision process.

1. University of Minnesota

The following is the assessment of the initial decision process used by the University of Minnesota in designing and implementing college-wide Web-Based courses:

a. Identify Goals

In fall 1996, the University of Minnesota's College of Education and Human Development (CEHD) administration asked the Web Development Team to design, develop, and implement a traditional college course for Web-Based Instruction. Their purpose is to design and maintain a standardized WWW presence for the college representing communications, student services, and instructional uses of the Web. Also, to create interest among instructors to develop and manage their own Web-Based course materials. [Ref. 28]

b. Needs assessment

The management and the present Web-Based Design Team started by assessing whether they had the required expertise and knowledge for the conversion process. Based on their assessment, they hired additional members for the Web Development and Design team to jump-start the initiative. Also included in the team were several members of the communication staff, a representative from the Technical and Information Services unit of the college, representatives from student support services, and the Assistant Dean of the college.

c. Establish Criteria

The University of Minnesota does not have an establish criteria in the courses and instructor selection, and vendor selection criteria were not applicable

d. Selecting module, instructor, and vendor

The team selected Course number 5145 (Social Studies and the Internet), which is mainly a lecture course. Also, the instructor selected was knowledgeable with the use of computers and motivated to work with the team in the conversion process. Selecting vendor is not applicable to this example since they have their own Web Development and Design Team.

e. Planning the Project

In planning their project, the Design Team's tasks were broken into three main areas: the Internet, the Intranet, and instructional uses of technology. The Internet was their first priority, as the existing site had been designed and implemented four years before. The initial redesign of the Intranet followed, with page graphics and templates designed to complement the college Internet site. [Ref. 28]

f. Other Issues and Constraints

The following constraints and issues were also identified in addition to the above assessment:

1. **Lack of Funds and Bureaucracy:** The management rejected some of the early ideas of technical experts. While the design team was busy resolving some of the hardware problems, the conversion process was hampered by the lack of funds, end-user hesitation to switch platforms, and the bureaucracy inherent in any large organization.

2. **Instructors' Opposition:** Some instructors voiced opposition to the plan of individual professors converting their own courses to Web-Based Instruction. In any group of users, knowledge on a particular subject will vary. While some of the instructors are well versed in effectively using the current technologies, while many are poorly prepared or have no knowledge of the latest advances. The Web-Based Design Team started the process of educating the faculty in the area of Internet development. They created the World Wide Web toolbox with the intention of providing a repository of information relating to the development and use of Web pages in the college. The toolbox was well received, but failed to generate significant interest from the faculty in Web-based courseware.

3. **Incentives and Compensation:** Instructors were hesitant to learn how to maintain and construct Web sites without some sort of incentive or compensation. The management and the team did not take the time to find out what incentives and compensation the instructors needed.

4. **Unanticipated Areas of Concern:** The Web-Design Team did not anticipate several areas of concern, such as Internet security and protecting copyrights on intellectual property, among others.

Although the University of Minnesota used an initial decision process, that process was inadequate because it failed to identify other issues, such as funding, bureaucracy, instructors' opposition and areas of concern mentioned above. However, their experience in converting their courses to NBI resulted in lessons learned that are beneficial to their future conversion projects.

Some of the lessons learned are the following: (a) must keep users' needs in mind first; (b) investigate what the university is taking with respect to Internet development; (c) consider the ability of instructors to implement and support any Web initiative; and (d) to start small and work up to a more ambitious as the development initiative progress.

2. Jefferson County Public Schools

The following is the assessment of the decision process used by Jefferson County Public School District:

a. Identify Goals

The Jefferson County Public Schools were interested in introducing K-12 on-line educational alternatives into their existing district-wide curriculum. Their intention was . to better serve students and faculty by designing an alternative course that would reach all the populations served by the district. [Ref. 26]

b. Needs Assessment.

Their first step was to conduct a formal needs assessment. The assessment was undertaken with the hopes of exploring and discovering academic directions that would enable the district to expand its educational vision and implementation and enable more students to successfully complete their high school education.

Based upon their initial assumptions and findings, they recommended the introduction of NBI alternatives as the most appropriate distance learning direction. They also conducted a cost-effectiveness analysis. Their goal was to design and deliver an alternative that would benefit all the populations served by the district.

As a result of their assessment, they formed an Initial Design Team. Their design team was comprised of self-recruited individuals who were able to bring critical expertise to the product development. These volunteers consisted of discipline-specific experts, Web-design professionals, program administrators, standards-based education consultants, and educational technologists. In addition to the input of people within their district, the school began closely working with outside agencies, industries, and organizations. Their reason for initiating this working relationship was twofold: (1) to ensure that work-related realities were introduced into their educational content; and (2) to strengthen their program base for future expansion and possible working partnerships. This

diverse mixture of knowledge ensured a strong foundation upon which to build and expand the NBI conversion initiative.

c. Establish Criteria

In this example, the Design Team established and fulfilled the criteria set forth by a number of educational conversion programs underway at different levels in the district. They established the following criteria for instructor selection: (1) appropriate content knowledge and experience; (2) competence with technologies required to deliver the course successfully--i.e., e-mail, real-time communications, group mailing lists; (3) ability to introduce and manage both synchronous and asynchronous communications and interactions; and (4) openness to emerging technologies and ways to apply them to online educational environments. [Ref. 26] Selection criteria for course/module were not addressed, and vendor selection criteria were not applicable.

d. Selecting Module, Instructor and Vendor

The Administrator and the Web Design Team selected the instructor and course to convert according to their established criteria.

e. Planning the Project

During the planning of their project, the team identified the standards and expectations. They were able to outline the requirements for their initial on-line course design and development. It was this step that enabled them to know, from the outset, the challenges ahead of them and ways to go about dealing with them.

They successfully developed a single Web-based course. In addition, they were attempting to integrate district content standard, alternative assessment formats, the latest technology, and sensitivity toward gender and culture. This is an example of an on-line program put together thorough clear and cohesive vision, careful planning, and teamwork.

E. ASSESSMENT OF THE IDEA (NPS) DECISION PROCESS

The following are assessments of the decision process used by IDEA in the conversion of these two EME modules to NBI using the Initial Phase of the ISD Model:

1. Identify Goals

The NBI conversion decision process began when the proposal IDEA submitted to NSHS was approved and funded by BUMED. Their goal is to convert traditional classroom instruction to EME modules to NBI. This initiative will provide senior DoD medical executives an opportunity for anytime, anywhere EME education on demand on both synchronous and asynchronous environments.

2. Needs Assessment

The IDEA management and the Distributive Learning Team discussed the project in detail and arrived at a consensus on how the development process would proceed. Based on this assessment, they agreed that they did not have the required knowledge and experience to do the conversion project in-house and recommended outsourcing the Web Design Teams.

3. Criteria for Selecting Modules, Instructors, and Vendors

The Distributive Learning Team did not establish the criteria for the selection of modules, instructors, and vendors for the conversion project. Without established selection criteria, it was difficult for the management and the team to arrive at solid decisions in these areas.

The management and the Distributive Learning Team, without previous experience in this work, should have conducted a more thorough assessment during this phase of the decision making process in order to define the problem and determine possible solutions. Part of this phase is the establishment of criteria or standards for selection of modules, instructors, and vendors prior to interviewing and selecting contractors. Careful analysis is more important when the project is a pilot study, where most of the decision-makers have little familiarity with NBI conversion. They should be careful to select only contractors

with proven track records and capabilities, who can convert and produce an excellent EME module to NBI.

In addition, there are no established criteria for module selection. The criteria used were from the study by Crawford and Suchan, "Media Selection in Graduate Education." This study was based on VTE media selection, not NBI. Many additional factors must be taken into account when selecting a medium of instruction: type of content, number and location of students, time available, instructional budget, and facilities available. Although the management and the distance learning team have knowledge of these factors, and made good module selections using Crawford and Suchan study; they do not have the educational support tools, such as Advisor 2.0, to help determine the feasibility and effectiveness of using several alternate media, including NBI.

IDEA does not have established criteria or standards for instructor selection. During the selection process, the management and the Distributive Learning Team selected Professor Doyle, based mainly on his success in teaching, as described in Chapter III. Since they had chosen Professor Doyle, IDEA must also select his modules for conversion. Thus, according to IDEA, it was a good match of professor and teaching modules. This appeared to be a favorable coincidence. Presently, the process used by IDEA is to select an instructor first and then select his or her respective module. One recommendation is to select the module that meets the criteria for conversion and is most beneficial for the senior medical executives; and then select the instructor assigned to the module who meets the established criteria for instructor.

As discussed in Chapter III, IDEA does not have a design team and has limited programming capability to convert EME modules to NBI. To achieve the conversion of EME modules, IDEA had no choice but to outsource to a Web design team. However, IDEA does not have established criteria for selecting vendors or contractors. They sub-contracted for their Web Design and Development Team and selected the two vendors discussed in Chapter III. STG was selected based on previous military training development experience, while Arista was selected based on their actual NBI course

conversion experience and being located in Monterey County. Although the two contractors may be doing the conversion of EME modules satisfactorily, a more effective way would have been to establish criteria and standards first and then select the most qualified vendor.

4. Planning the Project

In planning their project, the IDEA management and Distributive Learning Team submitted a well-written proposal to BUMED. Their proposal outlined the phased implementation of the distance learning applications within the EME Program. Also included were the plan of action, milestones, and deliverables for 1997-1998. However, some of the issues, concerns, and constraints on this conversion project were not addressed.

5. Other Issues and Constraints

a. Distributive Learning Team Performance

The process for selecting modules, instructor, and vendors starts with the Distributive Learning Team. The team is made up of NPS faculty members and staff whose job is to support and assist the management in making a sound decision. One team member was not involved in the decision process for vendor selection and did not have knowledge on why the vendors were selected. All members must be carefully selected and should be included in decisions and work as a team in order to be more effective in the decision making process. Their responsibilities include: (1) overseeing and managing the delivery of residential and distributed graduate education; (2) creating or adapting content to new distributed learning pedagogies; (3) exploring new instructional system technologies to foster collaborative learning environments (synchronous and asynchronous); (4) providing analysis in determining course/class attributes; (5) facilitating customer support/interface between facilities, contractors, and subject matter experts; and (6) conducting cost-benefit analyses of alternatives. The team should have identified and evaluated the soundness of alternative choices for modules, instructors and contractors before submitting its recommendation to the Director and Executive Director of IDEA for the final decision.

b. Support for the instructor

The instructor doing the conversion experienced some problems in working with the contractors, including incompatibility of the systems (Mac and IBM), contractors' underestimation of the amount of work to be done, and the need to deal with several points of contact. [Ref. 29]

The instructor encountered these problems during the early stages of transformation process. Although these problems were later resolved, both the professor and the contractor lost valuable time. This could have been avoided with careful advance planning, which includes establishing one project manager for each vendor, checking on the compatibility of NPS's and the vendor's system, and others.

c. Funding

Certainly, one constraint on this project was funding. The decision to implement a particular instructional program or change an existing one rests on identifying all the costs of research and development, personnel, and running the implementation for the life of the system, including operation and maintenance. Also, conversion of modules to NBI requires an up-front investment while resident training continues. With the $2.5 million funding for the EME program, which includes regular classroom training and conversion of EME modules to NBI and VTT, only a small portion of the funding is slated for research and development in the conversion to NBI. According to IDEA, BUMED is planning to convert about 28 EME modules to NBI. On average, it will cost $100,000 to convert each module to NBI; with 28 modules, this will amount to $2.8 million. A limited budget will definitely restrict further NBI conversion projects.

d. Instructors' Opposition

Another constraint is the instructor. Web-based instruction may be an excellent new tool for learning and teaching, but faculty members face many obstacles to its effective integration into instruction. Some faculty members are against the conversion of EME modules to NBI and the used of other distance learning media. They may be

unwilling to participate in the conversion process. Critical to the future of every tenure-tracked assistant or associate professor are promotion and tenure criteria. Without a doubt, the tenure process serves as a strong incentive for research and an equal disincentive for instructional innovation. As a result, junior faculty might believe it is not in their best interest to participate in Web-based instruction initiatives unless promotion and tenure criteria reward instructional innovation. [Ref. 30]

F. SUMMARY

The successful development and maintenance of a new instructional system, such as the conversion of course modules to NBI, requires a systematic decision process. This process should include analysis, design, development, implementation, and evaluation of the program. Criteria should also be established, especially in the module, instructor, and vendor selection process. This will eliminate surprises and non-performance.

Most first-time projects encounter more frequent problems when poor or inadequate decision processes are established and no careful planning is done. Many organizations, such as the University of Minnesota, Jefferson County Public Schools, and NPS, learned lessons from their experience that will be useful in their future NBI conversion projects.

IDEA management and the distributive team must recognize the importance of a comprehensive decision process in developing new instructional systems. Although an initial decision process was used, it was neither fully developed nor comprehensive. The criteria for selection of modules, instructors, and vendors were not included in their assessment. Additionally, some important issues such as instructor's compensation and incentives, intellectual property rights among others that may affect the future conversion process were not addressed.

V. CONCLUSIONS AND RECOMMENDATIONS

This research examined the decision process behind the conversion of course modules from the Navy Medical Department Executive Management Education curriculum to Network-Based Instruction. The objective was to track and model the process of integrating NBI technology into an existing traditional classroom course of instruction. The goal was to capture the context of the key decisions made during the preliminary stage of an actual conversion project and analyze the effectiveness of the approach.

A. RESEARCH QUESTIONS

1. What Process Was Used to Convert the Current EME Modules to NBI?

As discussed in Chapter IV, IDEA used a process that is not fully developed in the initial decision of converting current EME modules to NBI. This undertaking should be based on reasonable expectations regarding the probable outcomes or benefits from such an endeavor. The IDEA management and Distributive Learning Team should use models such as Instructional Systems Development to plan, develop, and deliver education and training programs.

2. Who Are the Stakeholders?

As discussed in Chapter II, a stakeholder is any group that is affected by the achievement of an organization's objectives. To be a stakeholder means to have an interest in the process or outcome of the issue. Some stakeholders may want things to stay the same; some may favor small changes of various sorts; some may want radical change. There may be stakeholders who are not involved in any controversy or process, yet have an interest in the issue. Active stakeholders are organizations or groups or occasional individuals who seek to affect the current initiative because of some interest. Some of them may be public-spirited or acting on behalf of others.

The EME initiative has six stakeholders, not all of whom are equally affected by or have a significant effect on the initiative:

1. Commanding Officers and senior military personnel are the most significantly affected by this initiative. They are required to complete the EME curriculum in order to acquire necessary proficiency and demonstrate professional administrative skills.

2. Congress is also an important stakeholder because, as the primary decision-maker, it issued a directive to the DoD concerning the required skills, knowledge, and experiences an MTF commander must possess.

3. Clearly, DoD, including the individual military services, has a major stake in this EME initiative. The DoD's position is that the training of senior medical personnel is vital for health care executives to achieve the necessary skills.

4. Professors who are experts in their respective fields comprise another group that can exert influence. The obvious impact of this initiative is that, as more medical officers go through this program, more professors are needed to teach the required skills.

5. BUMED has a direct impact on the EME initiative. They are involved in the design and funding of the EME program based on the competencies identified.

6. NPS Institute for Defense Education and Analysis (IDEA) is charged with the development, delivery and management of EME programs.

3. What Is the Perceived Value of the Conversion to NBI?

The conversion of EME modules to NBI will provide an opportunity for anytime, anywhere EME education on demand in both synchronous and asynchronous environments. Also, successful conversion of EME modules to NBI may eventually become a revenue generator for NPS. The potential benefits are increased training effectiveness and savings of travel and per diem costs for resident training. As discussed in Chapter II, training effectiveness is a complex outcome measure. It includes the ability of NBI to provide at least the same amount of knowledge and as well-educated of a learner compared to the traditional classroom, quicker ability to update course materials, and increase throughput of the number of students.

4. What are the Significant Resources and Constraints?

One of the resources and constraints on this project is funding. The decision to implement a particular instructional program or change an existing one rests on identifying all the costs of research and development, personnel, and life cycle costs, including operation and maintenance. Also, conversion of modules to NBI requires an up-front investment while resident training continues.

Another potential constraints are instructors. According to IDEA, BUMED plans to convert 28 modules to NBI, finding all 28 qualified instructors could be difficult. Faculty members are faced with many obstacles to its effective integration into NBI instruction. Some faculty members are against the conversion of EME modules to NBI and the use of other distance learning media. Because of the publishing demands of a tenure-track position and other duties, it is difficult for professors to spare the time and help the Web Design Team in providing his or her input to their modules' design, development, and implementation. Even when the conversion of module is being outsource to private contractors, this still requires a lot of instructor's time to work with vendor. Also, some instructors are poorly prepared and have no knowledge in latest computer technologies. During the implementation stage, it would be helpful for the instructor to possess a broad range of computer skills to deliver the course successfully--i.e., e-mail, real time communication, and group mailing lists. If faculty members must acquire any of these new skills in order to carry out their vision, entire weeks and months can be swallowed without a significant product to demonstrate. Another reason for instructors objection to EME conversion is the lack of incentives and compensation.

B. CONCLUSIONS

As the Information Age evolves, and technical advances make resources more accessible, NBI is becoming a more viable medium to facilitate learning. Several organizations, including the DoD, schools, and private companies, have adapted to this changing technology. NBI makes it easier and quicker for organizations to train and

educate their personnel anytime and anywhere. However, conversion of EME modules to NBI requires a large investment up-front. Transformation of more modules will reduce the number of training days, resulting in greater savings. The potential benefits are increased training effectiveness and saving of travel and per diem costs for resident training.

Developing and maintaining a new instructional system, such as the conversion of course modules to NBI, requires a decision process. This process should include analysis, design, development, implementation, and evaluation of the program. Criteria should also be established, especially in the selection process. This will eliminate surprises and non-performance.

C. RECOMMENDATIONS

Based on this research, the following recommendations are made:

1. Continue the conversion of EME modules to NBI. The more modules are converted the more cost effective it will be. Also, converted EME modules can reach the greatest number of students anytime and anywhere.

2. Establish a proven decision process such as the ISD Model to plan, develop, and deliver educational programs. This will help assists in fulfilling the requirements for the successful implementation of educational and training programs.

3. Provide training to professors who are willing and interested in converting their EME modules in the future.

4. Establish compensation and incentives to attract and create interest among professors in converting EME modules to NBI.

D. AREAS FOR FURTHER RESEARCH

The conversion of EME modules to NBI raises possibilities for future research. These include: (1) life cycle maintenance and upkeep of the program (2) marketing and implementation; (3) intellectual property rights; and (4) empirical testing to determine the effects, number of sites, students, and different learning outcomes.

APPENDIX FEASIBILITY STUDY PRODUCED BY ADVISOR 2.0

BASIC INFORMATION

Date:	04-17-1998
Course Title:	Budgeting for Defense Health
Course Number:	Module 24
Course Manager:	Professor Richard Doyle
Operator:	LT Cesar A. Odvina
Date of Last Audit:	04-17-1998

ENVIRONMENT

REGULATIONS

Regulations

Reasons for Course:	Combination
Classification:	Public Domain
Testing Requirements:	Skill / Knowledge

ORGANIZATIONAL

Administrative

Development / Revision Time:	Adequate
Trainers / SME Availability:	Adequate
Reference Material Availability:	Accessible
Consistency:	Important
Delivery Time:	Flexible
Scheduling:	Meets demand
Data Collected:	Large

Course

Objectives:	Job performance
Content:	Specific
Status:	New

Trainees

Size:	>1000
Location:	Scattered
Value of Trainees Time:	Very high

TRAINING I

Trainers

Delivery Method:	SME
Data Collected:	All of the above
Resistance to Change:	Medium

Trainees

Team Work:	No
Evaluation:	Skill / Knowledge

Course

Relevance:	Prerequisite
Content:	All of the above
Referred To:	Regularly
Expected Life (years):	> 5 years
Stability (%):	5% to 10%
Urgency:	Moderate
Length (hours):	4 hours

TRAINING II

Content

Hands on Exercises:	No
Personal Safety:	No
Equipment / Data Integrity:	No
Real Equipment:	Required, available
Real Equipment Simulation:	Moderate
Processor in Real Equipment:	Not applicable
Guided Discussions:	Desired
Role Play:	No
Teaming Exercises:	No
Audio:	Required
Full Motion Video:	Desired
Still Images:	Required

INSTRUCTIONAL

Trainees

Receptive to computers:	Yes
Reading Ability:	Adequate
Resistance to Change:	Medium
Motivation:	Medium
Skill / Proficiency:	Diverse
Ability to Travel:	Limited
Access to Computer:	Anytime
Access to Multimedia PC:	Anytime
Access to Video Conferencing:	Limited
Access to Internet / Intranet:	Anytime

Content

Learning objectives:	Knowledge / Skill
Self Pacing:	Most of course
Share Experiences:	Not required
Apply Knowledge:	Complex

SUMMARY

Delivery Methods / Media	Scores
Multimedia CBT	94 %
EPSS	87 %
Embedded Training	84 %
Hypermedia	83 %
Internet / Intranet	83 %
Video Tapes	72 %
On-location Seminar	67 %
Audio Tapes	63 %
Video-Tele Conferencing	60 %
Video Conferencing	60 %
Classroom	58 %
Computer Conferencing	57 %
Audio Conferencing	50 %
Simulators / Virtual Reality	0 %
Customized CBT	0 %
Intelligent Tutorial	0 %
Off-the-Shelf CBT	0 %

Hypertext	0 %
Print	0 %
Simple CBT	0 %

LIST OF REFERENCES

1. Joint Medical Skills Development Group, Executive Skills Training Report to Congress, July, 1996.

2. Bureau of Medicine and Surgery, Military Health-care Executive Management Education Program Brochure, November, 1994.

3. Bednarz, Dan and Wood, Donna, Research in Teams, A Practical Guide To Group Policy Analysis, Prentice Hall, 1991, p. 23.

4. Lineal George, "Distance Education," *Healthcare Executive*, The Magazine for Healthcare Leaders, Vol.13 No. 2, March/April 1998, p. 56.

5. Rossman, Mark H., and Rossman, Maxine E. "Distance Learning Technology," Facilitating Distance Education, Jossey-Bass Publishers, San Francisco, 1991, pp. 11-12.

6. Khan, Badrul H., "Web-Based Instruction (WBI): What is it and Why is it?" Web-Based Instruction, Educational Technology Publications, Englewood Cliff, New Jersey 07632, 1997.

7. Wilson, Rachel, Developments in the Internet, [On-line] http:// www.sonoma.edu [Accessed: March 11, 1998].

8. Ritchie, D. C. and Hoffman, Bob, Rationale for Web-Based Instruction, [On-line] http//www.edweb.sdsu.edu.html [Accessed: March 11, 1998].

9. Voss, Chris, Seminar at Harvard University, Using Internet in Teaching, [On-line] http://www.lbs.lon.ac.uk/om/webrept2.html [Accessed: March 2, 1998].

10. "The New U," *Business Week*, December 22, 1997.

11. Defense Information Systems Agency, IPMO INFOSEC Computer Based Training, [On-line] http://www.disa.mil.html [Accessed: March 2, 1998].

12. Metzko, J., Redding, G. A., and Fletcher, J. D., Distance Learning and the Reserve Components, IDA Document D-1941, Institute for Defense Analyses, December, 1996.

13. Crossman, David W., *The Evolution of the World Wide Web*, Web-Based Instruction, Educational Technology Publications, Englewood Cliff, New Jersey 07632, 1997.

14. James, W. B., and Blank, W. E., *Reviewing and Critique of Available Learning Style Instruments for Adults*, Applying Cognitive Learning Theory to Adult Learning, New Directions for Adult and Continuing Education, Jossey Bass Publishing, San Francisco, California, 1993.

15. Green, Samantha J., "Cost Effectiveness Analysis of Converting a Classroom Course to a Network-Based Instruction Module," Master's Thesis, Naval Postgraduate School, Monterey, California, December, 1997.

16. Lamar, Steve, A Proposal to Study, Implement, and Evaluate Distance Learning Applications, Associate Provost for Innovation, Naval Postgraduate School, Monterey, California, April 30, 1997.

17. Lamar, Steve, Executive Director, IDEA, Personal Interview, January 22, 1998.

18. Souza, Joe E., CDR, Director, Executive Management Education Program, Naval School of Health and Sciences, Personal Interview, December 9, 1997.

19. Roberts, Benjamin J., EME Program Director, IDEA, Personal Interview, January 21, 1998.

20. Crawford, Alice and Suchan, Jim, Media Selection in Graduate Education for Navy Medical Officers, NPS-SM-96-003, December, 1996.

21. Romiszowski, A., *Educational Media and Technology Yearbook*, Telecommunications and Distance Education, Libraries Unlimited, Englewood, Colorado, 1994.

22. Hannum, Wallace and Hansen, Carol, Organizational Systems Development in Large Organizations, Educational Technology Publications, Englewood Cliff, New Jersey, February, 1989.

23. Broihier, Michael G., "Applying Technology to Marine Corps Distance Learning" Master's thesis, Naval Postgraduate School, Monterey, California, September, 1997.

24 Vogel, Merle J., Instructional Systems Specialist, Fleet Training Center, Telephone Interview, San Diego, California, March 26, 1998.

25. Bahlis, J., "Advisor 2.0" BNH Expert Software, author, Telephone Interview, Quebec, Canada, April, 1998.

26. Derry, D. D., Introducing Online Educational Alternatives, Web-Based Instruction, Educational Technology Publications, Englewood Cliff, New Jersey 07632, 1997.

27. Jafari, Ali, *Issues in Distance Education, The Online Journal*, October, 1997.

28. Simione, A. H., and Tuttle, J.M., Designing and Implementing College-Wide Based Course, [On-line] http: www.uvw.edu/~hag/naweb97.html [Accessed: March 3, 1998].

29. Doyle, Richard, Professor, NPS, Personal Interview, January 26, 1998.

30. Williams, B., and Peters, K., Faculty Incentives for the Preparation of Web-Based Instruction, Web-Based Instruction, Educational Technology Publications, Englewood Cliff, New Jersey 07632, 1997.

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