

AU/ACSC/137/2000-04

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

TECHNOLOGY AND THE AIR FORCE
NONRESIDENT INTERMEDIATE PROFESSIONAL MILITARY
EDUCATION: A SUCCESSFUL MARRIAGE

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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April 2000

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Abstract

Throughout history, state leaders, military leaders, and military theorists have recognized the important role that the military plays in achieving national objectives. To ensure success, military members must be adequately educated and trained. Current legislation, policies, and documents reflect those same views. Air Command and Staff College develops and administers intermediate level professional military education for the Air Force.

Given the importance of professional military education for accomplishment of military and national objectives, the resident and nonresident curriculums should be equivalent. Yet, when compared, a significant difference exists between them. Increasing the use of and correctly integrating technology into the nonresident program is one option that can narrow the gap between curriculums. But should the Air Force integrate more technology into the nonresident intermediate professional military education program?

To answer the overall question, two hypotheses were developed and explored. First, Air Force majors must be pre-disposed to be successful at distance learning programs. Second, the curriculum must be enhanced by the correct integration of technology. Both were found to be true.

Overall, Air Command and Staff College should continue efforts to integrate technology into the distance learning curriculums. Further research is needed in the areas of organizational change, resources, and security implications to explore possible disadvantages on the mechanics of integration.

Part 1

Introduction

“In its most positive application, it is used to cross difficult physical and social boundaries, reaching minorities, high-risk learners, and the handicapped, overcoming the tyranny of time and distance and equalizing opportunity for our nation’s disenfranchised. In its worst, it uses its incredible power to reach large student bodies to reinforce old standards and misconceptions and propagate new ones. In both cases it incorporates the techniques and technologies that seem unnatural in typical classroom settings and yet are part of the everyday environment that students will encounter after graduation.”¹

— Jason Ohler

Problem Statement/Research Question

What one thing could possibly wield such power? The answer is distance education which integrates technology. Air Command and Staff College (ACSC) develops and administers a nonresident program which services the majority of Air Force majors and, additionally, other service majors, international officers, and Department of Defense civilians. The distance learning department has started to integrate technology into the curriculum. But is it the right thing to do or to continue? Professional military education is necessary, yet not all officers are able to attend the resident course of an intermediate service school. Given that the education is necessary, it follows that the nonresident curriculum should strive to provide equivalent education, or as close as possible, as the resident program. Correctly integrating increased technology in the nonresident curriculum is one method that can raise the nonresident curriculum

to the same level as the resident curriculum. This study answers the following question: should the Air Force integrate more technology into the nonresident ACSC program?

Purpose

Currently, little or no research has been published that answers this specific question. Related and comparable research and information, however, is available. This paper brings together some of the available information to answer this question. In addition, it provides recommendations for further research.

Limitations and Delimitations

This study has limitations/delimitations. First, although some information used originated from outside Air Force sources, the study is focussed on Air Force intermediate professional military education. Second, demographics from surveys do not necessarily match the demographics of the population eligible for Air Force intermediate service school. Third, Hedegaard's profile of a successful distance learner included two means for each attitude and value: one from a pre-test at the beginning of the degree program and one from a post-test at program completion. Only the post-test results are being used for comparison because there was no significant difference between the pre- and post-test means used for this study. Third, information presented is based on ACSC curriculum versions 2.X and does not take into account changes planned for version 3.0. Finally, demographic information is based on line officers, however the overall results may be applicable to non-line officers.

Definitions

The definitions used for this paper are:

1. Civic Action--“Importance in being an active and responsible member of the community”²
2. Communication--“Importance of communication skills in contributing to professional success”³
3. Cooperation--“Importance of establishing and rewarding cooperative relations in organizations”⁴
4. Distance Education--Any education where the student and instructor are not collocated.
5. Education--“Importance placed on life-long learning”⁵
6. Ethics--“Importance of having standards of fairness in dealing with employees and customers”⁶
7. Risk-taking--“Value assigned to taking risks in order to achieve goals”⁷
8. Self-efficacy--“Professional self-confidence and esteem”⁸
9. Successful distance learner/student--a student who completes a distance program
10. Traditional assessment--objective evaluation, e.g. multiple choice exam

Notes

¹ Jason Ohler, “Why Distance Education,” *The Annals of the American Academy of Political and Social Science: Electronic Links for Learning* (March 1991), 34.

² Terry Hedegaard, “Learning Online and On Campus: A Comparison of Adult Students’ Professional Attitudes and Values.” Master’s Thesis, University of Phoenix, 1994, 13

³ Hedegaard, 13

⁴ Ibid.

⁵ Hedegaard, 12

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

Part 2

Background and Significance

Throughout history, state leaders, military leaders, and military theorists have recognized the important role that the military plays in achieving national objectives. To ensure success, military members must be adequately educated and trained. Current legislation, policies, and documents reflect those same views. Air Command and Staff College (ACSC) develops and administers the intermediate level professional military education for the Air Force.

SunTzu

Sun Tzu, one of the earliest recorded military theorists, discussed the importance of war and the role that education and training plays in victory. He stated that “war is a matter of vital importance to the State...It is mandatory that it be thoroughly studied.”¹ He recognized that national unity (passion/will of the people) was key to victory and he related war to politics (government/political aims) and to the ability of the army (courage and talent). He stated “the general who understands war is the Minister of the people’s fate and arbiter of the nation’s destiny.”² Specifically, he points out that wisdom is a necessary quality for military leaders. Sun Tzu’s most famous quote “know the enemy and know yourself”³ also addresses the importance of education and training. Military leaders must learn both their own and their enemy’s doctrine, tactics, and dispositions in order to be successful in military operations. Sun

Tzu also pointed out that success can be partially determined by looking at “which has the better trained officers and men,”⁴ indicating the necessity to train all officers.

Von Clausewitz

Von Clausewitz, like Sun Tzu, discussed the importance of war and the keys to victory. He stated that war is “merely the continuation of policy by other means”⁵ and that it should be used by the State, in addition to other means, to accomplish political objectives. Victory is obtained by balancing the aspects of the “paradoxical trinity:” the government (political objectives), the people (their passion or will), and the military forces (their courage and talent). The military forces gain courage and talent through knowledge and experience. Von Clausewitz wrote that studying and analyzing military theory leads to familiarity and skill. Skill is an essential ingredient of talent. “Theory then becomes a guide to anyone who wants to learn about war from books; it will light his way, ease his progress, train his judgement, and help him to avoid pitfalls.”⁶ He pointed out that studying war theory over a long period of time (an officer’s career) was more effective than trying to master it in a short time. “Theory exists so that one need not start afresh each time sorting out the material and plowing through it...It is meant to educate the mind of the future commander, or, more accurately, to guide him in his self-education...”⁷

Current Legislation, Policies, and Documentation

Goldwater-Nichols Defense Department Reorganization Act of 1986 (Goldwater-Nichols Act)

The Goldwater-Nichols Act mandates joint professional military education and training for officers of the US military that Sun Tzu and von Clausewitz advocated. The Goldwater-Nichols Act makes the Chairman, Joint Chiefs of Staff responsible for that education and training.

National Security Strategy (NSS)

The Goldwater-Nichols Act also mandates the publishing of a national security strategy. The current NSS, like the Goldwater-Nichols Act, views professional military education as a necessity. The NSS discusses the use of the military instrument of power to shape the international environment, respond to threats and crises, and prepare for the future to safeguard and advance national interests. The NSS states that personnel quality is the most critical factor for success. “The quality of our men and women in uniform will be the deciding factor in future military operations. We must ensure that we remain the...best trained military force in the world. Accordingly, we will continue to place the highest priority on programs that support...training and education.”⁸

National Military Strategy (NMS)

The Chairman, Joint Chiefs of Staff develops the NMS from the President’s NSS. The NMS defines the military objectives and strategy necessary to meet the national objectives. Similar to the NSS, it calls people a strategic enabler, the most important in fact, for the implementation of the strategy. Paralleling the NSS, it describes education and training on a joint and coalition level as necessary. “Only the most dedicated, well-trained personnel...will succeed in the

complex and fast-paced environment of future military operations...We must provide...continual professional development.”⁹

Joint Vision 2010

Joint Vision 2010 is the document called out in the NMS as the conceptual template for future joint warfighting. In keeping with the documents it flows from, it focuses on people as the essential element for success. Two foundations for the vision of quality forces are training and readiness, and leader development. Based on these foundations, Joint Vision 2010 states that future leaders at all levels of command must understand the interrelationship of the instruments of power, the actors in the international system, historical contexts, communication skills and capabilities of all the services. Joint Vision 2010 also states that training in these areas needs to be joint and to begin as early as possible and continue throughout an officer’s career.¹⁰

Air Command and Staff College

The Air Force provides the education and training directed in the legislation, policies, and documents through various means, including professional military education programs. Joint professional military education at the intermediate level is provided by ACSC. The college utilizes two programs to provide this education, resident and nonresident. The nonresident program can be accomplished three different ways: 1) physical seminar, 2) correspondence, and 3) cyber-seminar.

Comparison of Curriculums

The curriculums of these two programs have the same goal, however, differences exist between the resident/nonresident delivery methods. The differences can be categorized into the

areas of method of delivery, scheduling, course content, evaluations, interaction, and achievement.

Method of Delivery. Both programs incorporate cooperative learning among diverse students. The resident program is basically a traditional learning program. Students attend class for ten months. Delivery methods include faculty lectures, faculty-guided discussions, guest speakers, exercises, readings, and computer-based courseware. The nonresident program is a non-traditional program in that students are not collocated with an instructor. Delivery methods for the nonresident curriculum include student-guided discussions, readings, computer-based courseware and optional television broadcasts, internet bulletin board, and exercises. For the physical seminar, students meet face-to-face to discuss the lessons. For the cyber-seminar students meet online. For the correspondence method, students do not meet at all--each student accomplishes the work individually.

Scheduling. The resident program, as mentioned previously, requires attendance at the “campus” for ten months. Students attend full-time and do not perform duties in their career field. The nonresident program is accomplished on a part-time basis in addition to an individual’s primary work-related duties. Students are allowed 18 months for program completion, but physical and cyber-seminars typically are scheduled for 10.5 months. The nonresident program’s physical seminar and cyber-seminar methods require attendance at regularly scheduled class times, usually once a week. The physical seminar requires members to meet face-to-face while attendance for the cyber-seminar is online. The correspondence method is self-paced with no scheduled meeting times.

Course Content. Both programs have similar content. They achieve most of the same course objectives. The syllabi, including readings and actual courses, are updated annually. The

resident program, however, is more responsive to changes--updates can be made "just-in-time". The nonresident program, in its entirety, is only physically produced once a year and "just-in-time" updates are not possible. In addition, the nonresident methods do not incorporate a block of instruction on communication skills. The resident program adds a mandatory elective or research paper. Reading load is also not the same. Nonresident students have from 1.6 to 10.4 times the amount of pages of reading per day to cover versus resident students.

Evaluations. The resident program utilizes diverse alternative assessments. They include essays, multiple choice, briefings, and exercises. Each block of instruction typically has multiple evaluation instruments. Communication skills are evaluated in each block. Letter grades are assigned, with a "B" as the minimum passing grade, and a grade point average is calculated. The nonresident program utilizes traditional multiple choice assessment. Four multiple choice exams, each covering several blocks of instruction, are administered. Exams are numerically scored. The minimum passing grade is 70 percent.

Interaction. The resident program provides face-to-face interaction with experts in particular areas, faculty, and other students. Daily interaction with other students includes personnel from other services, civilians, and other countries. Students are purposefully mixed twice during the year to ensure diversity, which increases joint/coalition training. The nonresident program provides interaction with the faculty via a bulletin board. The physical seminar method provides face-to-face interaction between students, but there is no purposeful mixing of students to obtain diversity, since it is a part-time effort by students located at a particular base. The cyber-seminar method provides interaction similar to the physical seminar method, but student interaction is online, not face-to-face. Diversity in the cyber-seminar, however, may be increased compared to the physical seminar because students are linked from

many different bases. The correspondence method does not provide for interaction with other students.

Achievement. The resident program awards a Masters' in Military Operational Art and Science. The resident program also has awards such as distinguished graduate, outstanding team member, outstanding contributor, and research awards. The nonresident program does not award a masters' degree, however, personnel are credited with completion of intermediate level phase I joint professional military education. Other awards are not available.

Notes

¹ Sun Tzu. *The Art of War*. Translated by Samuel B. Griffith. (Oxford University Press, 1963), 63.

² Sun Tzu, 76.

³ Sun Tzu, 84.

⁴ Sun Tzu, 66.

⁵ Carl von Clausewitz, *On War*. Edited and translated by Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 87.

⁶ Clausewitz, 141.

⁷ Ibid.

⁸ *A National Security Strategy for a New Century*, (December 1999), 12.

⁹ *National Military Strategy of the United States of America* (September 1997), 27-28.

¹⁰ *Joint Vision 2010*.

Part 3

Issues

Given the importance of professional military education for accomplishment of military and national objectives, the resident and nonresident curriculums should be equivalent. Yet, when compared, differences exist between them in terms of delivery method, scheduling, course content, evaluations, interaction, and achievement. Increased integration of technology into the distance learning program is one option to narrow the gap between curriculums. But should the Air Force integrate more technology into the nonresident intermediate professional military education programs?

Research Design

This research will answer that question. The research design is qualitative and uses both descriptive and comparative methods. To answer the research question, two hypotheses were developed. First, Air Force majors are pre-disposed to be successful distance learners. Second, proper integration of technology will improve the nonresident curriculum.

Hypothesis 1

Hypothesis 1: Air Force majors are pre-disposed to be successful distance learners.

Methodology

This hypothesis was tested two ways. First, traits and values reported for successful distance learners were compared to those reported and described for military members. Second, motivation and completion rates were examined.

Comparison of traits and values

Distance education enrollment in the civilian sector is rising. Not all students have been successful distance learners, however. Several researchers have pointed out specific characteristics that indicate whether or not a student will be successful in a distance learning program. Field grade officers enrolling in ACSC appear to fit these profiles.

Parrott describes the general profile developed by the corporation for Public Broadcasting/Annenberg Project. A successful distance student is typically “over 26 years of age, highly motivated, goal-oriented, and unable to attend the traditional classroom setting.”¹ Sheets also provides a general profile. Her typical student is older, is a life-long learner (has had prior academic achievement and recent educational experience) and is highly motivated.

Majors in the Air Force fit these general profiles. According to demographics posted on the Air Force Personnel Center’s web page, the average age of majors on active duty is 38.1 years. The youngest majors are 31 years old. In addition, 88 percent of majors have obtained a masters’ degree or higher. In comparison, only 24 percent of captains have received a masters’ degree or higher, indicating that majors have recent educational/academic achievement and experience. As for ability to attend the traditional classroom setting, or resident intermediate service school program, only 11 percent of active duty officers are selected for and complete the resident curriculum.² The profile factor of motivation will be discussed later.

Recent surveys of Air Force intermediate service school distance learners also indicate that the demographics match the general profiles. In July 1999, of the students enrolled in version 2.1 of the distance curriculum who responded to the survey, the age ranged from 25-67 years old. Eighty-four percent have advanced degrees. Lt Col (Select) Woodrow Wilson of the Air Force Distance Learning Office, notes that ACSC serves “approximately 600 resident students and 7000 distance learning students annually. Almost all have at least one master’s degree and all have the maturity expected among a professional cadre.”³

Hedegaard describes a more specific profile. She surveyed students at the start and finish of traditional and distance programs. She compared their attitudes and values with respect to time and delivery method. She found that the successful distance students differed significantly from the traditional students, placing higher importance on the attitudes and values of self-efficacy, education, risk-taking, communication, ethics, civic action, and cooperation. The Air Force has core values which are character traits and values that all Air Force members are supposed “to read, to understand, to live by, and to cherish.”⁴ These core values of integrity first, service before self, and excellence in all we do are comparable to Hedegaard’s traits and values of successful distance learners, as discussed in the following paragraphs.

Self-efficacy. Hedegaard’s first trait, self-efficacy, or professional self-esteem, is brought out in all three core values. Integrity first includes the trait of self-respect both professionally and personally. Service before self directs military leaders to “strike a tone of confidence.”⁵ Excellence in all we do motivates personnel to develop their professional competence to its highest potential.

Education. Hedegaard’s second trait, education, or the belief that life-long learning is important, is best compared to the Air Force core value of excellence in all we do. That value

directs members to continuously improve. It specifically states that members, in the area of personal excellence, “must seek out and complete professional military education, . . . and continue to refresh their general educational backgrounds.”⁶

Risk-taking. Hedegaard’s third trait, risk-taking, is evident in the Air Force core values of integrity first and service before self. Integrity first includes courage. Courage is the willingness of the member to do what is right no matter what the stakes or consequences. Service before self puts professional duties before personal wants and needs. Those professional duties may be lethal, but this core value directs members to follow rules and orders and accomplish those duties.

Communication. Hedegaard’s fourth trait, communication, is found in the Air Force core value of integrity first. The trait of openness falls under integrity. Openness is described as encouraging “a free flow of communication within the organization.”⁷

Ethics. Hedegaard’s fifth trait, ethics, is also found in the Air Force core values of integrity first and excellence in all we do. In fact, all portions of integrity first--courage, honesty, responsibility, accountability, justice, openness, self-respect, and humility--apply to ethics. Integrity first is defined as doing the right thing in all circumstances. In excellence in all we do, community excellence includes mutual respect and giving people the benefit of the doubt.

Civic action. Hedegaard’s sixth trait, civic action, is described in all three Air Force core values. Integrity first, in the area of humility, points out that members are charged with the task of defending the Constitution of the United States of America. Service before self is almost identical to civic action. That value describes that the member’s primary responsibility is to serve one’s country. The core value of excellence in all we do describes a member’s role in the Air Force community and the responsibility for top performance in all areas.

Cooperation. Hedegaard's final trait, cooperation, is also described in all three Air Force core values. Integrity first is an integral part of cooperation. Integrity first directs that personnel "do not behave in ways that would bring discredit upon...the organization to which he belongs."⁸ The area of openness encourages communication to ensure successful cooperative relationships. Responsibility includes "pulling your own weight." Service before self tells members all personnel have a fundamental worth and they must have faith in the system. Excellence in all we do, specifically community excellence, is accomplished "when the members of an organization can work together to successfully reach a common goal in an atmosphere free of fear that preserves individual self-worth."⁹ That core value also describes the necessity for "a total commitment to maximizing the Air Force team effort."¹⁰

Motivation and Completion Rates of Nonresident Methods

Job security is a compelling motivation to complete intermediate service school via distance learning even if the student does not match the profile of the successful distance learner. "Move up or move out." "Do more with less." "Downsizing." "Whole person concept." These phrases are heard frequently in today's Air Force and indicate increased difficulty in completing an Air Force career. Personnel must be promoted to remain in the Air Force. Promotion factors include completion of professional military education and job performance. Promotion from captain to major is the first competitive step. According to statistics posted on the Air Force Personnel Center web page, in 1999, promotion rate for those in the zone was 86.5 percent. All officers selected for promotion had completed professional military education. Promotion from major to lieutenant colonel is more competitive. In 1999, the in-the-zone promotion rate was 64.5 percent. Of those promoted, 99.83 had completed intermediate service school. Currently, of the lieutenant colonels on active duty, only .3 percent have not completed intermediate service

school. The message these statistics send is that completion of professional military education will not guarantee promotion, but non-completion will almost certainly prevent it.

The effect of this motivating factor is seen in the distance learning completion rates. Of those enrolling, approximately 30 percent do not take the first exam. Over 80 percent of those taking the first exam will complete the program successfully. Personnel do not finish for a variety of reasons. Some leave the Air Force, some are planning to leave the Air Force, some are selected for the residence program, and some need to attempt the program more than once (because of scheduling problems, motivation, etc.).

Results

Hypothesis 1 appears to be true. Air Force majors fit the profile for successful distance learners. Their attitudes and values match both general and specific profiles described by several educators. In addition, the motivation to complete the intermediate service school distance learning program and the historical completion rates indicate that Air Force majors who want to continue their careers will ensure program completion.

Hypothesis 2

Hypothesis 2: Proper integration of technology will improve the curriculum.

Methodology

This hypothesis was examined by studying literature regarding the integration of technology into civilian distance learning programs, military education and training, and the ACSC nonresident curriculum.

Civilian Literature

Ohler describes why students are turning to non-traditional education. He lists numerous reasons, but cites scheduling conflicts as the primary reason. Other reasons include: “1. To overcome geographic isolation..., 17. Because the media are motivational..., and 19. To take advantage of a world of experts and resources that only media can provide.”¹¹

Educational programs incorporating technology to meet the needs of these students are being developed all across the country. Distance education, using technology, can link geographically isolated students and teachers, incorporate motivational media, and bring experts and resources to students who would not normally have access. Educational programs using technology have several advantages. Lane, citing Peck and Dorricot’s 1994 work, lists ten:

1. Students learn and develop at different rates...
2. Graduates must be proficient at accessing, evaluating, and communicating information...
3. Technology can foster an increase in the quantity and quality of students’ thinking and writing...
4. Graduates must solve complex problems...
5. Technology can nurture artistic expression...
6. Graduates must be globally aware and able to use resources that exist outside the school...
7. Technology creates opportunities for students to do meaningful work...
8. All students need access to high-level and high-interest courses...
9. Students must feel comfortable with the tools of the Information Age...
10. Schools must increase their productivity and efficiency.¹²

Other experts have also mentioned advantages. Ward states that technology will enhance instruction, save administrative time and money, provide more resources to the teachers and students, and extend education outside the school walls. The Economist mentions that in addition to lower cost, distance education utilizing technology makes learning more interesting. Hartschuh echoes that opinion--technology enables more interesting learning. Technology enables the instructor to have more diverse groups and more diverse lesson plans. He feels that technology increases the quality of instruction.

In Massachusetts, public schools are integrating technology into the classrooms. This technology, particularly networked computers, will “enable schools to convert from the traditional method of information transfer from teacher to student to more productive, student-centered, project-oriented, group learning.”¹³ The technology is expected to “enable schools to extend the school day at home, connect students on field trips with their schools and expose students to multiple points of view on different topics.”¹⁴ Internet access at the school is also expected to reduce educational inequities by making more information available to all students.

Negron describes Florida’s parallel effort. Technology reform is being proposed from kindergarten to college. Florida expects a large increase in enrollment and is worried about construction and class costs. University officials also mention that distance learning is “providing access at a time and place that’s successful to the learner.”¹⁵ Specifically, access to education has quadrupled through the use of multimedia.

Businesses are also integrating technology for job related education. Classes are being broadcast to several locations, enabling companies to keep personnel at work and providing them continuing education at the same time because “few companies can afford to lose the survivors of downsizing to weeks or months of off-site executive education courses.”¹⁶ Companies see distance learning as more practical, meaningful, and efficient. The schools see it as a way to conserve resources and increase impact.

Jones-Delcorde describes several advantages being noted by employers and employees in Canada. Most notable is that distance education coupled with technology makes it “possible to pursue programs offered in other countries, providing the student with an opportunity to develop an international education.”¹⁷

Ehrmann discusses even more benefits of online learning. He says that distance education is a viable option that many institutions are ignoring--it “can provide high quality education for off-campus students.”¹⁸ Specifically, some of the advantages he mentions are:

1. Physical presence is not necessary. Video lectures typically incorporate more innovative media.
2. More diverse student groups can be assembled.
3. Off-campus experts can be introduced into the network.
4. Students express themselves better electronically.
5. Electronic conversations provide more time to digest material.
6. More resources are available through the internet.

Distance education utilizing technology also has disadvantages. Most disadvantages revolve around the integration of the technology rather than the quality of instruction. Parrott states that “one of the greatest challenges to the implementation of widespread distance education programs on community college campuses has arisen among those faculty who are uncomfortable with distance education and reluctant to embrace its technologies.”¹⁹ Specifically, they are worried about job security. Other issues raised include intellectual property rights, course quality, and human interaction. Also, start up costs can be extremely high. In addition, Parrot mentions disadvantages to the students. She states that course completion rates are lower for distance students.

Byrne lists some of the same disadvantages. He mentions that some businesses are finding that at upper executive levels, distance education can not provide the learning gained from direct interaction. Distance education does not teach interpersonal skills.

Technology at the university is already causing problems at Washington State University, according to Monaghan. Teachers are reluctant to change their method of instruction. Also, they are concerned that students will not have contact with faculty members.

Gell and Cochrane add the magnitude of change to the list of disadvantages. Management and organizations of educational institutions will need to change. Changing education so dramatically will result, for at least a short period of time, in instability.

Military literature

The military has more than 20 years of experience integrating technology and instruction. Results and opinions from a military point of view parallel those from the civilian point of view.

Currently, publications and policies support the merger of technology and education. Joint Vision 2010 states that we will “further strengthen our military capabilities by taking advantage of improved technology and the vitality and innovation of our people to prepare our forces for the 21st century.”²⁰ The Air Force vision for distance learning is to provide learning opportunities “at the best time and place, based on sound instructional and economic criteria, using the proper mix of paper-based and technological media, while ensuring high quality education and training.”²¹ Air Force goals for distance learning include one to “capitalize on appropriate leading edge technology.”²²

Air Force and other military leaders are echoing the need for technology in education and training. Recently, Lt Gen William J. Donahue, director, communications and information, Headquarters US Air Force, and commander, Air Force Communications and Information Center, gave a lecture at Air Command and Staff College on command and control warfare. In response to a student question regarding whether or not it is important for leaders to become proficient with the use of technology, he stated that leaders, not just technicians, must be able to utilize technology. He further stated that technology must be incorporated into educational curriculums to familiarize personnel. He explained that we must train as we fight, and modern warfare incorporates technology. In addition, he opined that adults have approximately a 20

minute attention span. They need to have their senses excited in order to learn and to keep focussed. Incorporating technology into education would enable curriculums to be packaged into small, exciting training modules. Lt Gen Donahue also described a successful merger of technology and distance training at Air Combat Command. The command developed a training exercise which links the simulators of several warfighting platforms at different locations. The result has been more realistic and cost-effective training.

Similarly, Brig Gen Robert R. Blackman, Jr., President, Marine Corps University, presented his opinions at a conference on military education for the 21st century warrior. He stated that “We will have to provide a quality professional military education experience for every officer, whether he or she is active or reserve, or enrolled in a resident or nonresident program.”²³ He pointed to the employment of technology to enhance the nonresident education programs, explaining that “21st century military leaders will have to know how to use information-age technology and systems to best advantage” and that “Technology favors our efforts to provide this outreach.”²⁴ He described advances that were being made incorporating “interactive courseware, computer simulations, use of the internet and video-teleaching.”²⁵ These advances in the nonresident professional military education programs “will ensure that we have the educated force we need.”²⁶

Lt Col Woodrow J. Wilson, from the Air Force Distance Learning Office, describes the advantages of efforts to merge technology with the ACSC nonresident curriculum. Multimedia programming improves presentation. Interactive self-testing ensures “comprehension and assimilation of the course content.”²⁷ The online version provides “real time, collaborative learning to distance learning students.”²⁸ Video-teleconferencing broadcasts of lessons bring the instructor or outside resources to the student.

These technological improvements, with the exception of broadcasts, are well received by the students. In July 1999, distance students were surveyed regarding the improvements. Eighty-seven percent found the web site beneficial. Seventy-two percent agreed that the bulletin board was an effective tool for questions and issues. Fifty-three percent participated in an optional exercise, with 53 percent agreeing that the exercise met the objectives. Over 85 percent responded that they would prefer a computerized test. The only negative response to technology was in the area of broadcasts. Of those attending a broadcast, only 23 percent found it beneficial. Seventy-five percent felt the broadcast length was too long. In addition, most students would like to obtain a master's degree through the distance program (accreditation would probably require the integration of more technology).

Lt Col Wilson and Mr. Thomas E. Wolfe describe issues surrounding the integration of technology into curriculums. The issues of "policy, funding, media selection, courseware exportability, authoring software, minimum computer configurations, interactive television systems, scheduling conflicts, distance learning classroom design, and manpower"²⁹ revolve around implementing the technology, not negative results after implementation.

Proper Integration of Technology

Proper integration of technology should yield a positive result and be an enabler to accomplish objectives. The overall goal of any curriculum is for students to learn the material presented. For adult learners in particular, there is an additional goal of encouraging critical thinking. Assessments are the tools used to verify that learning has occurred. Modifications to curriculum should enhance student learning and/or measure that learning more accurately. Modifications, including the integration of technology, need to consider the type of students and what type of assessment is appropriate.

Adult learners, like those at ACSC, have a wealth of different experience and are ready to learn through experiential techniques. They need to know why they should learn something. They generally do not have patience for classes or classroom methods that do not contribute to their overall objective.

Different experiences make adult students a diverse group. Diverse groups of students need to be presented material in a variety of creative ways because not everyone learns effectively in the same way. A method to encourage critical thinking in diverse students is to use the multiple intelligence approach coupled with cooperative learning.³⁰ The multiple intelligence expands the focus of teaching to seven types of intelligence (described in Table 1), changing from forcing students to learn one way to letting them learn how they learn best and increasing student performance. Cooperative learning, where students teach each other, increases development of higher order thinking skills by requiring students to know the material at a higher level in order to teach it.

Table 1. Seven Intelligences³¹

Intelligence	Description
Word Smart	absorbs information by listening, reading, speaking, and writing
Logic Smart	uses number facts, scientific principles, observation, experimentation
Picture Smart	prefers visual demonstrations
Music Smart	uses background music, needs information presented melodically
Body Smart	catches on during exercise, needs hands-on
People Smart	learns best through group projects
Self Smart	personalizes lessons

Assessments measure student performance. Traditional assessments, like multiple choice tests, do not test higher order skills well. Alternative assessments, on the other hand, require the students to “produce things rather than pick answers from a multiple choice list.”³² They encourage critical and creative thinking by allowing the teacher to evaluate the processes used by

the students to arrive at answers. Overall, the assessment used needs to match the level of learning desired in order to be accurate.

These education theories can be applied to the integration of technology into the ACSC nonresident program. As mentioned previously, response to the integration of technology into the ACSC nonresident curriculum has been mostly positive, although not overwhelmingly so. Part of the negative response is due to technical problems with the implementation (lack of VTC facilities, technology malfunction, etc.). Part of the negative response is due to the incorrect integration of technology into the curriculum. The incorrect integration can be categorized into the areas of student type and assessment.

Student Type. ACSC nonresident students are a diverse group of adults engaged in cooperative learning (except for the correspondence method). Based on the previously described theories, the integration of technology needs to make learning more efficient and interesting (appeal to more intelligences) for all the nonresident students, but in particular for those engaged in cooperative learning. Generally, however, technology applications appear to have been added on to the curriculum rather than incorporated into it. The integration did not make learning more efficient. For those that used the enhancements, however, learning was more interesting. For example, test review chats and broadcasts were available to supplement coursework, yet the majority of students did not participate in the chat or find the broadcasts beneficial. Both the chats and the broadcasts were additional work/time. The additional work/time was probably not viewed as necessary or “worth it” to accomplish objectives. On the positive side, Tropic Thunder (an optional exercise), the bulletin board, and the website provide additional resources for students to learn materials in different ways (i.e. incorporated the multiple intelligence approach).

Assessment. As with the changes to the curriculum, technology was placed on, rather than integrated in, the assessments. The tests are multiple choice but are now available on computer rather than by hardcopy. The test itself was not changed/enhanced by the availability of technology. A portion of the curriculum's objectives are above the knowledge or comprehension levels. Multiple choice tests, as mentioned previously, are ill-suited to test those higher levels of learning. In fact, most students reported that the testing did not measure the knowledge obtained in the course.

Results

Hypothesis 2 appears to be true. Proper integration of technology into Air Force intermediate professional military education nonresident program can enhance the curriculum. The majority of literature in both the civilian and military communities favors the integration. Issues, problems, and disadvantages are centered on the mechanics of integration, not on the end result or effects.

Notes

¹ S. Parrott, *Future Learning: Distance Education in Community Colleges* (Los Angeles, CA: ERIC Digest, May 1995, n.p.

² *PersonnelStatistics*, n.p. On-line. Internet, 12 February 2000. Available from <http://www.afpc.randolph.af.mil/demographics/>.

³ "Distance Learning in the Air Force." n.p. On-line. Internet, 12 February 2000. Available from http://www.au.af.mil/afdlo/dl_in_af.htm.

⁴ *United States Air Force Core Values*, 1 January 1997, n.p.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ohler, 25-33.

¹² C. Lane, "The Role of Technology in the Systemic Reform of Education and Training." n.p. On-line. Internet. 1 May 2000. Available from: <http://www.wested.org/tie/.dlrn.html>.

¹³ P. Deringer, "Bond Bill," *Mass High Tech* (March 4, 1996), n.p.

Notes

¹⁴ Ibid.

¹⁵ E. Negron, "State Starts Era of Remote Learner--Forum to Focus on Universities' New Technology," *Sun Sentinel* (4 March 1996), 1a.

¹⁶ J. A. Byrne, "Virtual B-Schools," *Business Week* (October 23, 1995), 65.

¹⁷ D. H. Jones-Delcorde, (1995, Mar). "Distance Education--Promoting a Continuous Learning Curve," *Canadian Manager* 20, no. 1 (March 1995), 27-28.

¹⁸ S. C. Ehrmann, (1995, July 7). "Moving Beyond Campus-Bound Education," *Chronicle of Higher Education* 41 (7 July 1995), B2.

¹⁹ Parrott, n.p.

²⁰ *Joint Vision 2010*, n.d.

²¹ "Distance Learning in the Air Force." n.p. On-line. Internet, 12 February 2000. Available from http://www.au.af.mil/afdlo/dl_in_af.htm

²² Ibid.

²³ Brig Gen Robert R. Blackman, Jr., "Naval Postgraduate School and Office of Naval Research Conference on Military Education for the 21st Warrior." n.p. On-line. Internet, 12 February 2000. Available from <http://web.nps.navy.mil/FutureWarrior/Remarks/Blackman.html>.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Lt Col Woodrow Wilson, "Merging Technologies for Distance Education." n.p. On-line. Internet, 12 February 2000. Available from <http://www.au.af.mil/afdlo/papers/ice/ice.htm>.

²⁸ Ibid.

²⁹ Lt Col Woodrow Wilson and Thomas E. Wolfe, "The Air Force Distance Learning Office: Managing Distance Learning in the Information Age." n.p. On-line. Internet, 12 February 2000. Available from <http://www.au.af.mil/afdlo/papers/nutn/nutn.htm>.

³⁰ H. Gardner. *Frames of Mind: The Theory of Multiple Intelligences*. (New York, N.Y.: Basic Books, 1993).

³¹ Ibid.

³² M. C. McClellan, "Testing and Reform," *Phi Delta Kappan* 69 (June 1988), 643

Part 4

Conclusion

This paper posed the question of whether or not more technology should be integrated into the Air Force intermediate professional military education nonresident program. To answer the question, two hypotheses were developed, explored, and appear to be true. Air Force majors fit the profile for successful distance learners (hypothesis 1). Proper integration of technology into the Air Force intermediate professional military education nonresident program can enhance the curriculum (hypothesis 2). Therefore, technology should continue to be integrated into Air Force intermediate professional military education nonresident programs.

Recommendations

Recommendations are based on the advantages and theories brought out by the research. Air Command and Staff College should continue to integrate technology into the nonresident program in order to narrow the gap between curriculums (Table 2). Properly integrating increased technology in the nonresident program can enhance the learning experience of the nonresident student. The curriculum, including assessments, needs to be thoroughly reviewed and changed to incorporate technology correctly in order to make learning more efficient and interesting, and to truly measure the level of learning desired.

Table 2. Recommendations to Narrow Curriculum Gap

Area	Recommendation
Method of Delivery	Decrease readings in areas where a method using technology (such as exercises, interactive courseware, etc.) can be/is used; use creative methods of presentation to incorporate several intelligences
Scheduling	Implement an asynchronous cyber-seminar
Course Content	Publish curriculum in modules to allow for “just-in-time” updates; incorporate instruction on communication skills and an elective/research paper; modules should be “downloadable”
Evaluations	Assess every course with a variety of instruments; papers could be transmitted electronically to resident faculty
Interaction	Utilize technology to increase interaction with other services and to bring guest lecturers to the nonresident students
Achievement	Develop an awards program and make the awarding of an ACSC masters’ degree to nonresident students a reality

Suggestions for Further Research

Suggestions for further research are based on the issues and disadvantages of integrating the technology into the distance learning programs. Those areas are organizational changes, resources, and security implications.

Organizational Change

The impact that increasing the integration of technology will have on Air Command and Staff College should be examined. As mentioned previously, integration of technology may require organizational changes. Those changes may include, but are not limited to, increased staffing, modification of teaching departments, movement of staff between departments, or increased need for outsourced expertise. Organizational changes may produce detrimental effects on the staff, who may be resistant to change, or on the ability of the organization to support the residence program.

Resources

The area of resources also needs to be addressed. Most schools have found that initially the integration of technology required tremendous resources, although the investment paid off in the long run. Some organizational changes, like the need for outsourced expertise, will cost money. Workload may increase for some staff members. Additional hardware required will also cost money.

Another aspect of resources that requires further research is the availability of adequate resources in the field (both in garrison and at deployed locations). Personnel are performing at a high operations tempo. Temporary duty locations may not have the appropriate resources. In addition, use of resources may need to be prioritized between mission use and student use. The integrated technology will only enhance learning for those students on the receiving end who have access to appropriate resources to utilize it.

Security Implications

Prioritization of resources leads to another aspect requiring further exploration--security implications. Integrating technology may increase the demand on communications or other resources, impacting the conduct of military operations. In addition, information security will need to be examined to ensure that information on our strategies, doctrine, and tactics can not be exploited.

Summary

Starting as early as Sun Tzu and continuing to the present, military education has been viewed as vital for the success of military operations and ultimately the accomplishment of national objectives. Currently, Air Command and Staff College develops and administers the intermediate level of professional military education, but a gap exists between resident and

nonresident curriculums. Technology correctly integrated into the nonresident learning curriculums can narrow that gap and provide the best military education possible.

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