ATTITUDES OF UNITED STATES ARMY RESERVE PERSONNEL TOWARD COMPUTER TECHNOLOGY FOR TRAINING

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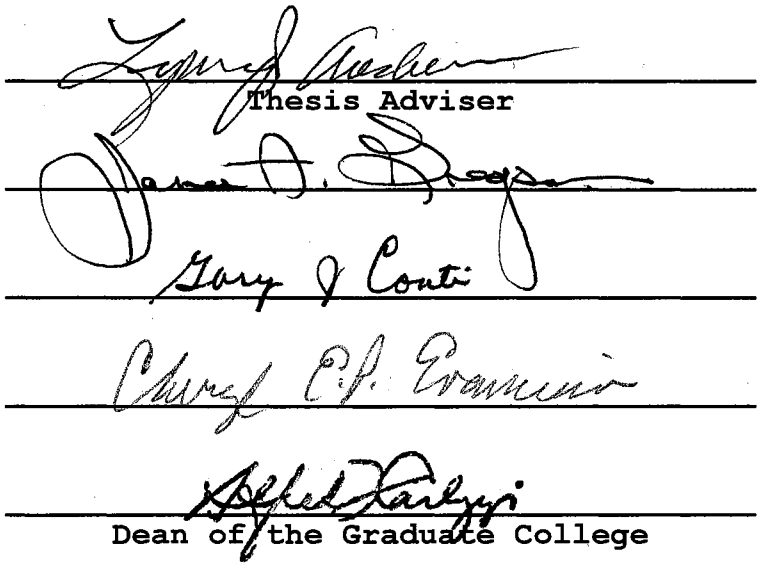

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CHAPTER I

INTRODUCTION

This study investigates and describes the attitudes of U. S. Army Reserve personnel toward computer technology for training. This study provides further understanding of attitudes and adds to the body of literature. This information will benefit the training environment using computer technology for training. Chapter I presents background information about the study of attitudes of United States Army Reserve personnel toward the use of computer technology for training. This chapter contains the following sections: (a) background of the problem, (b) statement of the problem, (c) purpose of the study, (d) research questions and hypotheses, (e) limitations of the research, (g) operational definition of terms, and (h) significance of the study.

Background of the Problem

The U. S. Army is focusing more emphasis in using computer technology for training (Wisher, 1999). This is

significant at a time when computer-based training is gaining importance in military training. Bates (1995) discussed the increasing importance of computer-based training for adults in the military whose physical circumstance and responsibility prevent them from attending a traditional classroom environment. Degan and Jacob (1998) argued, "The U. S. Army has compensated for resource reductions by focusing on integrating advanced technologies into the functional areas of training, testing and evaluation" (p. 95). This current evidence suggests that the United States Army Reserve is focusing more emphasis on computer technology in the training environment. Computer technology skills are important in training and job functioning in today's Army Reserve.

Carr (2000) identified the U. S. Army plans to offer personal access to college and university programs using distance learning. This proposal has the potential to affect the active and reserve force and identify the U. S. Army as one of the largest brokers of distance learning in the world. The potential increase of computer technology for education and training in the U. S. Army reserves establishes a need for digital competencies. It is becoming increasingly important for U. S. Army reservist to operate and train in a digital environment (Stout & Mills, 1998).

The United States Army Training and Doctrine Command (TRADOC) released the Army's distance-learning plan in April of 1995, which outlines the future of distance learning in the Army (Department of the Army, 1995). The Army plans to convert 525 traditional courses to asynchronous and synchronous modes of distance delivery (Wisher, 1999). Approximately 40 percent of military occupational specialty (MOS) reclassification will be accomplished through these distance courses being developed (Jelisavicec, 1998). Carter (1999) stated, "The digitized lessons are multimedia, computer-based instruction that can be delivered on demand to any student with access to the World Wide Web. The lessons also can be deployed on a local area network (LAN) or distributed via computer CD-ROM" (p. 27).

With the fact that the Army's strategic movement toward computer-based training is progressing, current evidence suggests that some learners encounter difficulties with this type of learning. Jelisavicec (1998) stated that some students encountered difficulties learning at a distance. The reasons he listed included: the lack of sharing and exchanging with other students, being separated and unable to share their interest and background, and difficulty interacting with the instructor outside the

classroom. Kerka (1996) reported learners' concern with computer operation skills influenced their success in distance learning. Given this research and the current lack of research data on the attitudes of U. S. Army personnel toward computer technology for training, there appears to be a need for examinations of this issue. Further research contributing to the understanding of learners' attitudes may provide information to assist military personnel in being more successful using computer technology and improving computer based training.

Military Rank

There are numerous variables that must be examined in identifying the appropriate mix of training. The researcher was unable to identify specific studies that associate military rank and attitude toward computer technology. It is therefore hypothesized, intuitiviely, that different military ranks may have different attitudes toward training because of their educational and experience background. Different rank structures have experienced different training environments and different methods of instruction. The background of a young soldier just coming into the military may be vastly different from a non-commissioned officer (NCO) who has been in the military for 10 years.

The perception and attitude toward instruction may be different, and attitude toward training may have changed over the years to accommodate the specific training environment of the military. The education of the NCO may be drastically different from that of a senior officer. Military education and experience may be totally different for specific ranks. This is a crucial reason in identifying attitudes of military members at different ranks about the computer for distance learning. Although this may appear a relatively simplistic statement, it is crucial that a complete examination of this element be made. By identifying how one relates military rank and experience to computer technology for training, one may better accommodate an environment for positive attitudes.

Years of Experience

U. S. Army Reserve personnel have specific competencies that should be achieved based on years of experience and military rank. The increase in years of experience should also equate to an increase in military schools attended and basic competencies to perform specific computer tasks and missions. An increase in years of experience of an individual should correlate with a more positive attitude toward the computer and less anxiety.

Toffler (1978) was a leader in identifying computer anxiety. He examined computer anxiety and what specific variables affected it. For instance, as an individual gets older, attitude and anxiety level may change. This same fact may be considered for experience or education. Some research has indicated that as students' experiences or education level increase, they may have a diminished anxiety level. If there is a lesser level of experience or education there may be an increase in the anxiety level (Koohang, 1987; Loyd & Gressard, 1984). Given numerous years of experience, a soldier may have a more positive attitude toward computer technology for training because of increased education and experience using technology in the workplace.

Gender

Many studies have been performed examining the difference in attitudes about computer technology from male and female perspectives. Numerous studies have identified no significant difference between male and female attitudes (Eastman & Krendle, 1989; Kay, 1989a; Loyd & Loyd, 1987). There is a lack of information examining U. S. Army reservist gender-based attitudinal difference with respect to computer technology. Therefore, based on available non-

military studies, it is hypothesized that the military environment should not reveal significant difference based on gender as it relates to attitudes toward computer technology for training.

Military Functional Area

Functional areas or military operational specialties (MOS) structures support the need of the Army to carry out its mission of supporting and defending the constitution. Different functional area schools have unique responsibilities to train soldiers for specific tasks such as Field Artillery, Infantry, Quartermaster, or Military Police. Corkan (1989) identified several functional areas in the Army Reserve and active Army component and studied several independent variables to identify if there was a significant difference in MOS competencies. Corkan identified that there were indeed differences in competencies based on functional area or MOS. This may support the hypothesis that different MOS structures have different competencies and may have different attitudes about computer technology for training.

Jelisavicec (1998) reported that because of downsizing and changes in missions, the military must reclassify approximately 40% of its military occupational specialty

(MOS). The reason for this reclassification is to provide an appropriate number of soldiers for each MOS. This reclassification will be partially accomplished through distance learning courses and digitized lessons being developed.

Computer Experience

There is a consistency in reporting relationships between attitudes about computers and experience in using them. Loyd and Gressard (1984) and Marcoulides (1988) determined that people had a more positive attitude if they had previous computer experience. Sacks, Bellisimo, and Mergendolle (1993) reported greater experience with computer technology was related to more positive attitude of an individual toward the computer. The fact that a student is interacting using computer technology tends to help increase their knowledge and experience about this tool (Kerka, 1996).

A key element is not only the amount of time spent using the computer but also specifically how the computer is being used. A researcher may attempt to use the amount of time an individual uses the computer to predict the level of attitude, but this level may by skewed for many reasons. One reason may be the specific application the

individual is using. If someone is using the computer over twenty hours a week, one may assume their level of attitude may be positive toward the computer. However, if one determines that the individual is using the computer to play games or surf the Internet, these twenty hours a week may not be relevant to productive use.

The crucial element is the amount of time spent with a specific application or specific software. Igabaria, Guimares, and Davis (1995) examined this situation as variety of use and perceived use. Perceived use, in this context, referred to the importance of the usage and possibly the specific type of software package or application being used. Numerous studies have been conducted looking at computer attitudes (Igbaria & Parasuraman, 1989). These studies support the belief that positive attitudes about the computer may be directly proportional to its use.

Previous Military Training

Research suggests that students that have taken a distance learning course are willing to take additional distance learning courses (Smith & Dunn, 1991). Bozik (1996) found that students having taken a previous course using distance learning would chose to continue as a

distance learning student, and the convenience of the distance learning environment was a positive element in their participation. Attitudes appear to change with having participated in a distance learning course. It is hypothesized that having taken a computer course in the military using a CD-ROM or the Internet will result in a more positive attitude about computer technology for training.

Statement of the Problem

Wisher (1999) identified that the U. S. Army is focusing more emphasis toward using computer technology for training. The Army is integrating technology into the training environment because of resource limitations (Degan & Jacob, 1998). There is little information on the attitudes of U. S. Army reservist toward computer technology for training. By understanding attitudes toward computer technology, insight may be gained in order to maintain and develop an environment conducive for training. An underlying problem is to determine if U. S. Army Reservist have different attitudes toward computer technology for training, given specific criteria, and if they have the positive attitude to facilitate the changing computer driven training environment.

Purpose of the Study

The purpose of this study is to determine attitudes of United Sates Army Reserve Personnel in the 95th Training Division toward computer technology for training. Attitudes were measured by the Computer Attitude Scale (Loyd & Gressard, 1985). Military personnel were asked to respond to specific questions. Responses provided quantifiable scores on the following sub-scales: computer anxiety, computer confidence, and computer liking. Results of the study may provide further understanding of the attitudes of United Sates Army Reserve personnel toward computer technology for training. This information will benefit the training environment using computer technology for training. It is therefore important to add to the body of literature, which provides a clearer understanding of U. S. Army Reserve personnel attitudes toward computer technology.

Research Questions and Hypotheses

Research Questions

1. What are the attitudes of U. S. Army Reserve personnel toward computer technology for training, as

measured by the Computer Attitude Scale (Loyd & Gressard, 1985) on computer anxiety, computer confidence, and computer liking. This question was answered using descriptive statistics.

2. Are there differences in attitudes based on: military rank, years of service, gender, military functional area, experience using the computer, and having previously taken a military course using the Internet or computer based training of U. S. Army Reserve personnel toward the computer as measure by the Computer Attitude Scale (Loyd & Gressard, 1985). The question was answered using specific hypotheses.

Statement of the Hypotheses

Rational for Hypotheses

Attitudes differ given specific variables. Different military ranks may have different attitudes toward training, because of their background. Soldiers with different years of experience may have variations of attitudes because of the duration of their years in the military. Some evidence suggests that soldiers with different functional areas have different attitudes toward computer technology for training (Corkan, 1989). There is

consistent research evidence that supports the hypothesis that increased computer experience increases positive attitudes toward the computer (Sacks, Bellisimo, & Mergendolle, 1993). In line with non-military studies, soldiers are expected to have no difference in attitudes given their gender difference (Eastman & Krendle, 1987; Kay, 1989a). Having had previous military training using the CD-Rom or the Internet is hypothesized to increase the positive attitude toward computer technology for training.

Specific Hypotheses

The following hypotheses were tested in this study:

$H_0$1: There is no significant difference among attitude sub-scale scores based on military rank.

H1: There is a significant difference among attitude sub-scale scores based on military rank.

$H_0$2: There is no significant difference among attitude sub-scale scores based on years of experience.

H2: There is a significant difference among attitude sub-scale scores based on years of experience.

$H_0$3: There is no significant difference among attitude sub-scale scores based on gender.

H3: There is a significant difference among attitude sub-scale scores based on gender.

$H_0$4: There is no significant difference among attitude sub-scale scores based on military functional area.

H4: There is a significant difference among attitude sub-scale scores based on military functional area.

$H_0$5: There is no significant difference among attitude sub-scale scores based on computer experience.

H5: There is a significant difference among attitude sub-scale scores based on computer experience.

$H_0$6: There is no significant difference among attitude sub-scale scores based on previous military training using a CD-ROM or the Internet.

H6: There is a significant difference among attitude sub-scale scores based on previous military training using a CD-ROM or the Internet.

Limitations of the Study

The study was limited to determining attitudes of U. S. Army Reserve personnel in the 95th Training Division based on three subscales of the Computer Attitude Scale (CAS) (Loyd & Gressard, 1985). This study was limited to United Sates Army personnel serving within the 95th Training geographical area. This fact limited the researcher's

ability to make generalizations about the total U. S. Army Reserve force.

The military requested that no consent form be used or signed due to security and anonymity requirements. No signed documents were permitted to the researcher. Surveys were voluntary and all responses were confidential and anonymous. There were no questions asked about names or social security numbers in this survey. This process limited the researcher's ability to track and follow-up on non-respondents. Gay (1992) identified that a one time mailing will result in approximately a 50% return rate. Gay suggests that low response percentage, under 70%, may weaken the validity of the conclusions and make problematic the accuracy of generalization. Low response rates of under 70% from military members in the present study limited the researcher's ability to make accurate generalizations.

There is additionally vast interpretation of specific terminology used in this study. Terminology, in some cases, is very relative to an individual. Perception of a specific term may be defined in numerous ways. The operational definition of terms should articulate terminology and lessen subjective interpretation.

Operational Definition of Terms

The terms used in this study are operationally defined as follows:

1. Military rank is identified as: (a) Private 1=(PV1, E-1), (b) Private 2=(PV2, E-2), (c) Private First Class=(PFC, E-3), (d) Specialist or Corporal=(SPC or CPL, E-4), (e) Sergeant=(SGT, E-5), and (f) Staff Sergeant=(SSG, E-6).

2. Years of Experience: Identified as the total number of years a soldier has been contracted with the U. S. Army Reserve.

3. Functional area is identified as: (a) Combat Arms (CA) inclusive of Armor, Artillery, Air Defense Artillery, Infantry and the Special Forces branches; (b) Combat Support (CS) inclusive of Chemical, Corps of Engineer, Military Intelligence, Military Police, and Signal Corp; and (c) Combat Service Support (CSS) inclusive of Adjutant General's Corps, Chaplin Corps, Civil Affairs, Finance Corps, Judge Adjutant General (JAG), Medical Services, Ordinance Corps, Quartermaster Corps, Staff Specialist Corps, and Transportation Corps.

4. Computer experience is identified as: (a) beginner (no experience or games only),

(b) intermediate (familiar with one to four applications, such as word processing or spreadsheet), and (c) advanced (familiar with more than four applications).

5. Previous computer based military training is a yes/no response indicative if a member has previously taken a military course using a CD-ROM or the Internet.

Significance of the Study

The information made available through this study may provide further understanding of the attitudes of United States Army Reserve personnel toward computer technology for training. By understanding attitudes of U. S. Army Reserve personnel the reserves, who will be able to structure the training atmosphere to accommodate the reserve member. Training using the computer for a distance-learning tool is still in its infancy. This information will benefit the training environment using the computer for training. Information about attitudes may assist military personnel to be more successful using computer technology for training. This study will add to the literature, which will provide a clearer understanding of attitudes of reservists toward computer technology for training.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Chapter II reviews literature dealing with the following factors: (a) overview of computer technology (b) military structure, (c) adult learners, (d) attitudes.

Overview of Computer Technology

There have been many demands and expectations placed on the military to adapt to computer technology (Jelisavicec, 1998). Technology has changed the way business, industry, educational environments, and the government trains. The use of computer technology for distance learning in the military has grown dramatically over the last several years. This growth will likely continue into the future at a rapid rate (Bates, 1995). According to Khan, (1997) "we are blessed with the emergence of the World Wide Web, commonly know as the Web,

as one of the most important economic and democratic mediums of learning and teaching at a distance" (p. 5).

There are many methods used in conducting training, and specifically distance learning, using technology. Distance learning, with the help of multimedia, can provide video, sound, animated graphics, and text to provide a more interesting means of grasping a concept (Heide & Stilborne, 1996). "The World Wide Web (WWW) is based on a display of pages that can integrate text, pictures, sound, and video" (Heide & Stilborne, 1996, p. 105). The combination of these elements can be more interesting than text alone. This environment can be similar to television and provides a type of a hyper-reality. Luke (1991) identified, "The world is not brought into our homes by television, as much as television brings its viewers to a quasi-fictional place, hyper-reality"
(p. 14).

Flynn and Tetzlaff (1998) highlighted that instructors should have fundamental knowledge in multimedia and the Internet for education purposes. They describe several aspects of distance learning such as low-bit-rate encoding, Moving Picture Expert Group (MPEG), bandwidth, and authoring systems. With these elements, educators can provide an environment where students can apply their

experience using the computer to improve learning. Arn, Kordsmeier, and Gatlin-Watts (1998) stated that, "many educators believe that well-designed simulations can provide an opportunity for students to apply classroom knowledge to more complex, realistic situations, improving the learning process" (p. 376).

Methods of Distance Learning

Moore and Kearsley (1996) reported that distance learning from a historical perspective has existed for many years, and traditionally the main format was correspondence courses. Correspondence study is still the most widely used method for distance education. There are, with technological advances, many new methods of distance learning. Technology is constantly changing, and the fluidity of this environment creates a very dynamic atmosphere. Educators and trainers are using these changes to increase the availability of distance learning and also taking advantage of new technologies (Duffy, 1997). Duffy, Lowyck, & Jonassen (1993) identify some of the delivery methods for distance learning as:

1. Print, which can be delivered through mail or downloaded from the Internet. Some of the traditional methods of print may be correspondence study, training

manuals, or study guides. Other methods for this medium may be chat-rooms, bulletin boards, on-line course sites, and E-mail.

2. Audio, which can be delivered through personal computer, telephone, radio, cassette players, and the Internet. Some of the types of audio are audiocassettes, audio conferencing, audio tele-training, radio broadcasting, streaming audio, or voice mail.

3. Video, which can be performed over satellite, cable, telephone, personal computer, or the Internet. Some of the devises used may be DVD, CD-ROM, streaming video, videocassettes, and computer-mediated conferencing that can be delivered through computer networks.

4. Computer-based-training, which is identified by a stand-alone training application, may include audio and video.

Distance learning, using the Internet, has yet to reach its full potential because of numerous technological limitations. These technological limitations are identified by Kruse and Keil (2000), they stated:

> There are only two real disadvantages to Web-Based Training (WBT) and both will be overcome in the next five to ten years as high bandwidth network connection become as common as telephones. The first drawback of WBT compared to live instruction is the lack of human contact, which greatly impacts learning...The second major drawback is the lack of

> multimedia in many WBT program. The use of audio and video are critical to creating compelling metaphors and realistic job simulations. (p.55)

Over the next few years, these technological limitation are expected to diminish (Khan, 1997).

Computer Technology in the U. S. Army

Jelisavicec (1998) reported that the military, for the most part, has been on the forefront of distance learning. Jelisavicec also discussed how soldiers could work on their lessons and keep in touch with instructors and classmates via e-mail. This new environment allows soldiers to train wherever they are and whenever they need to be trained. The learning environment may no longer be one of a classroom. The military is currently implementing many new methods of distance learning. Fletcher (1995) states, "Initiatives in military training technology have affected civilian application in the past and may do so again" (p. 140). Scott (1998) stated, "It is important to point out in the current context that many developments in the educational uses of computers have had their origin in research or created man-machine system for military purposes and in research to improve military performance" (p. 60).

Carter (1999) stated "Digitized lessons are multimedia, computer-based instruction that can be delivered on demand to any student with access to the World Wide Web. These lessons can be deployed on a local area network (LAN) or distributed via a computer disk-remote operating memory (CD-ROM)" (p. 27). In the future, soldiers may attend courses that are streamed or use self-paced learning modules delivered at many location such as their unit, on the job, or at home (Wisher, 1999).

Recently, as in academia and industry, the military is shifting its focus from predominantly face-to-face instruction to more of a distance learning structure. An important reason for this shift is to increase accessibility of learning. A major concern with this shift is the increasing gap between individuals who possess computers and those who do not (Wright & Yate, 1999). This "digital divide" separates those individuals because of economic differentiations. The "digital divide", while significant in some contexts, should not be a concern in this study because reserve members have access to a computer, at a minimum, at their U. S. Army Reserve unit.

Jelisavicec (1998) identified that the military, over the next few years, will spend millions of dollars developing and distributing distance learning courseware.

Outdated Reserve Component Configured Courseware (RC3) on Army leadership, functional, and professional development courses will be replaced by the Total Army Training System Courseware (TATS-C). "The Total Army School System (TASS) will use Total Army Training System (TATS) courses to train the same task to the same standard for soldiers in the active Army, U.S. Army Reserve, and the U.S. Army National Guard" (Jelisavicec, 1998, p. 8). The Army projects it will develop technology-based courseware to make it possible for students to be free from traditional classes and schedules.

Distance Learning in the Army

New technology and approaches to learning have numerous advantages and disadvantages. The Army is developing these courses for many reasons, some of which related to the obvious financial benefits and the expedience of delivery. There are several studies available on the effectiveness of distance learning in the military (Keene & Cary, 1992; Wisher, 1999). Keene and Cary evaluated two groups in a study of Army officers attending the Command and General Staff College (CGSC). One group received instruction in the traditional classroom setting while the other group received instruction through computer teleconferencing, interactive video, and audio

teleconferencing. The students who received instruction using the distance learning method showed superior knowledge over the students that were taught using conventional methods.

Military agencies are actively implementing distance learning courses to change from the traditional classroom environment (Metzko, Redding, & Fletcher, 1996). Kouki & Wright (1996) and Redding & Fletcher (1994) examined some of the advantages and disadvantages of distance learning. Some of the advantages were positive student-to-teacher interaction, increased student-to-student interaction because of Internet relay chat, multi-user simulation, and multi-user dimension environment.

Distance learning from a technological perspective has made for an easily accessible system for learning in the military. Valceanu (1999) stated that "Computer equipment and the Internet have made a 'virtual classroom' available to academy students, allowing them to complete coursework without leaving their home stations" (p. 21). Distance learning can consist of many different methods from full multimedia presentations to interactive lessons. Another advantage of distance learning is just-in-time training. "A just-in-time approach will enable the delivery of critical information where and when it's needed in just the amounts

needed. Avoiding the delivery of excessive information will ensure that workloads for the user will remain manageable" (Balthazar, Chute, & Hancock, 1999, p.1).

Training with Computer Technology

According to the United States Office of Technology Assessment, "Technologies for learning at a distance, will clearly affect the teaching force of tomorrow. Some will teach on these systems...and many will receive professional education and training over them, few will be unaffected" (USOTA, 1989, p. 20). With the advent of technology, distance learning has taken greats steps in solidifying its base of providing needed training requirements for individuals. The world will continue to change in business and government. Institutions will find it more and more difficult to keep their workforce educated on the changing world (Balthazar, Chute, & Hancock, 1999). Distance learning will provide a resource that will assist numerous agencies, specifically the military, in providing needed training.

Staddon (1993) discussed how learning can be somewhat problematic because as learning evolves, a previously ineffective stimulus may become very effective and, likewise, a past effective stimulus may become very

ineffective, depending on the environment. This concept in distance learning poses new challenges not only to the students but also the instructor. Knowledge about how these instructors and students adapt to this new environment is crucial within the learning context. Therefore, it is essential to possess an understanding of the challenges of learning theories and especially theories about distance learning using the Internet.

Holmberg (1981) remarked that learning is, for the most part, an individual activity. Individual activities are usually supported with the assistance of an instructor, possible peer interaction, or in groups. Unlike in a traditional learning environment, the distance learning student is responsible for personal work, usually independent from a structured atmosphere and free from direct supervision. A student must not only have the discipline to take this course but must posses the attitude to excel in this environment.

Smith and Dunn (1991) found that students have positive views about taking another distance learning course after competing an initial course. Students who have experience with a distance learning course are more likely to have positive views of distance learning and confidence to maintain distance learning coursework (Bozik, 1996). One

of the essential elements for the student, is maintaining motivation for the educational process. Students must realize before taking a distance learning course that the challenges they face are different than a traditional course. Students having previously taken a distance learning course understand that they must be better focused, have better time management skills, be able to work independently, have perseverance, self-discipline, and self-motivation (Hardy & Boaz, 1997).

Military Structure

Rank Structure and Years of Experience in the U. S. Army

Department of the Army Regulation 600-200 (1984) identifies numerous ranks in the U. S. Army. This regulation clearly identifies the range of military ranks and their qualifications. The rank structure is consistent in the U. S. Army Reserve. Rank structure for the U. S. Army Reserves is described by AR 600-200 as:

1. Private/E-1 (PV1): The lowest ranking military member. The minimum age requirement for this rank is 17 years.

2. Private/E-2 (PV2): Is also identified as Private. PV2 has a pay grade increase and is normally

promoted to after one year of service, depending on the individual's service record. A new enlisted soldier may enter the Army as an E-2, dependent on previous experience and college hours. The minimum age requirement for this rank is 17 years.

3. Private first class/E-3 (PFC): Normally identified also as a Private. An E-2 may be promoted to an E-3 after one year of time in grade, dependent on past service record. Additionally, one may enter the service as a PFC dependent on previous experience and college hours. The minimum age requirement for this rank is 17 years.

4. Specialist/E-4 (SPC): A member at this rank must serve prior enlisted time before promotion, or have obtained an associates degree. If a degree has been obtained, the military member may enter the service as a Specialist. A member who does not have the appropriate credit hours for immediate promotion to Specialist may accrue points from college credit, correspondence courses, military schools, and awards. The minimum age requirement for this rank is 17 years.

5. Corporal/E-4 (CPR): The soldier normally has two years service and must attend Primary Leadership Development Course (PLDC). The Corporal, like the Specialist, must accrue promotion points and be selected

for promotion. Corporal rank is somewhat similar to the rank of Specialist, but is the first NCO (Non-Commissioned Officer) rank. The minimum age requirement for this rank is 17 years.

6. Sergeant/E-5 (SGT): A Sergeant selected for promotion normally must serve three years enlisted service to be considered for promotion, but this may be amended with a waiver. There is no minimum age requirement for this rank, but normally a Specialist or Corporal is promoted to sergeant prior to their eight year of service. Again, points must be accrued for promotion from college credit, correspondence courses, military schools, and awards.

7. Staff Seargant/E-6 (SSG): A Staff Sergeant must meet all requirements mandated for prior ranks. This rank is dependant on availability of positions and promotion points. A Staff Sergeant is normally in a position of increased responsibility. There is no minimum age requirement for this rank, but normally a Sergeant is promoted to Staff Sergeant prior to their 12th year of service (Department of the Army Regulation, 600-200, 1984).

Military Functional Area

Department of the Army Regulation 10-6 (1990) identifies numerous functional areas or military

operational specialties that make up the U. S. Army. These functional areas are applicable in the active force and in the U. S. Army Reserve. There are three main categories of functional areas: combat arms, combat support, and combat service support. Each main functional area category is comprised of specific branches. A specific branch may be included in one of the functional areas, two of the areas or all three of the areas. Each branch requires different competencies and knowledge to perform a specific function (Corkan, 1989).

Combat Arms

The combat arms area consists of branches involved in the act of conducting hostilities or fighting. This functional area normally consist of:

1. Air defense artillery, which has the mission of protecting the military from missile and aerial attack, and provides surveillance.

2. Armor, which has the mission to engage and destroy the enemy using maneuver, fire, and shock action.

3. Aviation, which has the mission to find and destroy the enemy through maneuver and fire. An additional task is to provide combat service support (CSS) in operations.

4. Field artillery, which has the mission to destroy and neutralize the enemy by rocket and cannon missile fire.

5. Infantry, which has the mission to engage the enemy, then use fire and maneuver to destroy or capture them. In addition, the infantry repels assaults by fire, close combat, and counterattack.

6. Special Forces, which has the mission to provide special reconnaissance, unconventional warfare, and foreign internal defense in an unconventional warfare environment (Department of the Army Regulation, 1990).

Combat Support

The combat support area consists of branches which provide assistance to the combat arms area and performs combat missions when needed. This functional area normally consist of:

1. Chemical corps, which has the mission to provide training, scientific development, and acquisition in operations in order to support nuclear, biological, and chemical (NBC) programs.

2. Corps of engineers, which has the mission to execute a three-fold tactical mission of mobility, counter-mobility and survivability.

3. Military intelligence, which has the primary mission to collect, analyze, produce, and disseminate intelligence information.

4. Military police, which has the mission in a tactical environment of battlefield control, area security, enemy prisoner of war (EPW) and civilian operations. The underlying function is law and order of operations.

5. Signal corps, which has the mission to use systems, networks, and resources to integrate and synchronized data with the use of information technology (Department of the Army Regulation, 1990).

Combat Service Support

The combat service support area consists of branches which normally provide administrative and logistical support to the U. S. Army. This functional area normally consist of:

1. Adjutant general's corps, which has the mission to assist in building and sustaining operation and readiness with planning and managing all military personnel activities.

2. Chaplain corps, which has the mission to provide religious support for military members and their family.

3. Civil affairs, which has the mission to control civil military operations (CMO) in a peace and war-time environment.

4. Finance corps, which has the mission to provide expertise in all aspects of financial management to military members.

5. Judge advocate general (JAG) corps, which has the mission to provide the administration of the Uniform Code of Military Justice (UCMJ). This process includes, but is not limited to, criminal, civil, contract, and international law.

6. Medical services, which is comprised of individuals from medical, dental, veterinary, Army medical specialist, Army nurse, and medical service corps. These branches have the mission to provide broad spectrum medical service support.

7. Ordinance corps, which has the mission to support the operation with the use of ammunition, missiles, and electronics. This branch is concerned with the development, production, acquisition, and maintaining of weapons systems.

8. Quartermaster corps, which has the mission to provide for the acquisition, receipt, and storage of equipment, parts, materiel, subsistence, petroleum, and other general supplies.

9. Transportation corps, which has the mission to provide for the movement of personnel and through comprehensive, multi-modal operations (Department of the Army Regulation, 1990).

Adult Learners

As Maehl (2000) identified, "It is well recognized that U. S. military services are among the largest sponsors of adult education in the country" (p. 221). Different types of learners have different attitudes about learning and training. By understanding the specific characteristics of adult learners, one may be able to enhance their attitudes by providing an environment beneficial to them. Adult learners have unique experiences and diverse educational backgrounds. Adult learners also have unique learning characteristics that have been elaborated upon by many authors such as Elias and Merriam (1995), Knowles (1980, 1984, 1998), Maehl (2000), and Merriam and Caffarella (1999).

Knowles (1980, 1984, 1998) suggest that learning is typically derived from real world experiences, and these real world experiences can relate to that learning situation and provide for a better grasp of the information. He identified four underlining properties of adult learners. First, he identified the learner as self-directed and independent in the pursuit of information. Second, the real life experience of the learner must be acknowledged and built upon. Third, the readiness to learn is driven from the learners' occupational and social roles. Finally, the learner is driven by the possibility for immediate application of the knowledge or skill. Harbour, Daveline, Wells, Schurman, & Hahn (1990) identified that adult learners have six specific characteristics:

1. Adults need to associate new knowledge with their old knowledge.

2. Adults bring a substantial amount of real world experience and education into the classroom.

3. Adults like to learn from organized materials.

4. Adults sometimes let mistakes affect their attitude or self-esteem.

5. Adults are usually interested in subjects that are relevant, practical, and applicable to their life.

6. Adults must feel psychologically and physically comfortable in the environment.

Merriam and Caffarella (1999) identified that "Computer-assisted instruction, teleconferencing, interactive videodisk, the Internet, and the world wide web (WWW) are expanding the possibilities of meeting the growing learning needs of adults" (p. 17). This is just as applicable in the military as it is in the civilian environment. As shown in figure 1, Driscoll (1998) identified how an instructor facilitates the adult learner and showed how it can be applicable to web-based training (p. 19).

Principles of Effective adult Education Facilitation	Principles of Effective Web-Based Training
Use the experiences of learners.	Interactive (learners choose sequence, respond to quizzes participate in online conferences).
Develop problem-centered programs.	Nonlinear (learners select and sequence their lessons and access resources on the Web)
Involve learners in planning and evaluating.	Easy-to-use graphic user interface (intuitive menus, easy-to-understand icons, background colors and text provide clues)
Develop interactive programs.	Structured lessons (clear guidance and directions for each lesson)
Use multimedia elements in meaningful ways.	Effective use of multimedia (text, graphics, video, sound, and animation convey content)
Create a safe and respectful environment.	Attention to educational details (clear objectives, adequate practice, and meaningful feedback)
Encourage exploration, action, and reflection.	Attention to technical details (free of "bugs" and the links to other web sites work)
Nurture self-directed learning.	Learner control (to select navigational paths sequence content, determine level of detail, and select presentation mode)

Figure 1. Principles of Effective Adult Education and Web-Based Training (Driscoll, 1998, p. 19).

Attitudes

Attitudes are the predisposition of a person to measure or evaluate an object or aspect of his or her existence in a positive or negative manner. These attitudes can be expressed both verbally and nonverbally (Katz, 1960). Allport (1935) developed the concept that attitudes were a mental state, developed through life experiences and these experiences affected the individuals' actions to situations and stimulus. Although this is an early definition of attitudes, it is applicable because it shows that attitudinal theory was significant 75 years ago.

Eiser (1994) stated that attitudes vary from person to person. Attitudes are very much an individual characteristic, and are a specific habit or thought process. Attitudes make it possible to not only be aware of oneself, but also the environment one is in. Eiser also identified that attitudes can be evaluated. Attitudinal research can examine feelings and emotions, not merely calculations. Attitudinal beliefs vary not only from person to person, but also within the context of an individual's experiences and education. A specific attitude is often relative to an environment and frame of reference from an individual. Some theorists have found attitudinal beliefs

conceptually evasive. Halloran (1976) claimed that attitudes are difficult to define because of conceptual, ideology, and psychological beliefs. He stated that although attitudes are difficult to define, he believe they are learned.

There are numerous definitions for attitudes and how they are applicable to computer training and computer usage. One may examine how attitudinal studies look at key aspects of the specific domains of learning: cognitive, psychomotor, and affective. Each domain plays a role within the attitudinal context. Theorists have perceived attitudes as locus of control, liking, anxiety, confidence, training, and usefulness (Brannon, 1985; Kay, 1989b; Loyd & Gressard, 1984).

Henerson, Morris, and Fitz-Gibbon (1978) claimed that a self-report procedure is very appropriate in order to identify attitudes. The researcher must assume the sample of participates have the ability to understand their own feelings and beliefs. If the researcher can be confident of this assumption, then a self-report procedure should be used. Henerson et al. (1978) also found that there were numerous advantages to using attitude rating scales: They allow the individual time to examine the questions; They can be distributed to numerous individuals simultaneously;

They allow the individual anonymity, which would be positively perceived from a military perspective because it allows soldiers to be genuine in describing their feelings or beliefs; They provide for consistency across the measurement spectrum; And, the data may be more easily analyzed than a verbal response.

Positive Attitudes and the Computer

Mitra (1998) examined many terminologies of attitudinal research. Mitra found that there was a significant correlation in the amount of computer use to the level of positive attitude towards computers. He reported the more individuals used the computer, the more positive their attitude toward the computer; Similarly, the less individuals used the computer, the lower the level of positive attitude toward the computer.

Other elements such as motivation and self-efficacy are also applicable. An individual's motivation is one of the key elements in identifying the success of a student in a distance-learning course (Oxford, Park-oh, Ito, & Sumrall, 1993). Self-efficacy is the belief and confidence one must have to accomplish a specific task. As self-efficacy increases, so does the level of performance and positive attitude (Gist, 1989; Taylor, Locke, Lee, & Gist,

1984). Gist, Schwoerer, and Rosen (1989) also showed that as the level of self-efficacy increased, so did competency on software training.

Rosen and Weil (1999) found that computer instruction should be taken in small amounts, with students being encouraged and use hands-on practices. These efforts can increase the positive attitudes by building confidence. An important element that Egan (1997) identified is the need to be self-motivated and self-disciplined to successfully finish an independent distance-learning program. Students are motivated by different stimuli, virtual reality (VR) is a stimuli that may provide students with another means of interaction and communication with the computer (Psotka, 1995). This multi-sensory dimension can provide a realistic simulation and a realistic pragmatic immersion, which can increase positive attitudes.

Negative Attitudes and Computer Anxiety

One of the major factors in negative attitudes is anxiety level. Anxiety levels, predominately in the form of negative reactions to the computer, may provoke feelings of apprehension, fear, and hostility (Gardner, Discenze, Dukes, 1993). One of the key elements in understanding attitudes toward computer technology is computer anxiety.

Bradley and Russel (1998) reported that up to 30% of their subjects reported that they felt some discomfort with the computer, and another 10% had severe computer anxiety.

Bowere and Bowere (1996) identified that techno-phobia is an anxiety formed because of the fear of social disgrace in dealing ineffectively with technological advances. They examined the development of techno-phobia, which looks at the levels of technologically induced stress. Some of the characteristics identified were uneasiness, apprehension, or tension. Turkle (1984) stated that some individuals have negative attitudes toward the computer because of the efficiency and the complexity of this tool. This negative attitude may diminish with a more user-friendly computer.

Schneiderman (1980) identified one of the major steps in reducing the level of computer anxiety is identifying a concern with an individual in reference to a specific variable, such as education, experience, or age. Steps must then be taken to develop computer software to facilitate the needs of that individual. Schneiderman stated five elements that are crucial in developing software to ease the burden of computer anxiety these elements focus on: (a) ease of use, (b) simplicity in learning, (c) improved reliability, (d) reduced error frequency, and (e) enhanced user satisfaction. Although this article seems somewhat

dated, from current perspective, it is very applicable. Only by understanding these differences can we better utilize the computer to facilitate an environment conducive for the increased positive attitude of the learner.

Conclusion

The military is using computer technology for training (Jelisavicec, 1998). The growth of computer technology for training will continue to grow in the military environment (Bates, 1995). Distance learning using computer technology has generated both positive and negative attitudes. Eiser (1994) identified that attitudes are an individual characteristic. By understanding attitudes of learners, one may be able to structure the learning environment to accommodate individual students (Kruse & Keil, 2000). Researchers realize the importance of attitude in training and education (Mitra, 1998; Rosen & Weil, 1999). With knowledge of learner attitudes, leaders should optimize the training environment to encourage more positive attitudes.

CHAPTER III

METHODOLOGY

This chapter presents information about the following areas: (a) summary of the study, (b) instrumentation, (c) research questions and hypothesis, (d) population and sample, (e) data collection procedures, and (f) data analysis.

Summary of the Study

The purpose of this study was to determine attitudes of United States Army Reserve personnel toward computer technology for training. Attitudes were measured by the Computer Attitude Scale (Loyd & Gressard, 1985). Military personnel were asked to respond to specific questions. These responses provided quantitative scores on the following sub-scales: computer anxiety, computer confidence, and computer liking. Results of the study may provide further understanding of the attitudes of United Sates Army Reserve personnel toward computer technology for training. It is therefore important to add to the body of

literature, which presents a clearer understanding of U. S. Army Reserve personnel attitudes toward computer technology.

Instrumentation

The Computer Attitude Scale (CAS) was designed in 1984 and updated in 1985 by Brenda H. Loyd and Clarice P. Gressard to measure attitudes toward the computer. The CAS originally had four 10-item subscales: computer anxiety, computer confidence, computer liking, and computer helpfulness. The CAS has been used with adult populations in numerous studies. For example, the CAS has been used with health and banking sectors of industry (Henderson, Deane, Barrelle, & Makar, 1995), and high school counselors (Stone, Thompson, & Lacount, 1989).

In the updated CAS, individuals responded to questions by rating items on a four-point Likert-scale. The scale ranged from "strongly agree" to "strongly disagree", depending on how the question was stated. The survey was scored as follows:

1. For questions 1, 3, 4, 6, 9 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38: Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1.

2. For questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40: Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4.

The four sub-scores were:

1. Anxiety: Questions 1, 5, 9, 13, 17, 21, 25, 29, 33, 37.

2. Confidence: Questions 2, 6, 10, 14, 18, 22, 26, 30, 34, 38.

3. Liking: Questions 3, 7, 11, 15, 19, 23, 27, 31, 35, 39.

4. Usefulness: Questions 4, 8, 12, 16, 20, 24, 28, 32, 36, 40.

The CAS questions are structured and coded so the higher the scores, the more positive the attitude. For instance, a higher confidence score means more confidence and a higher anxiety score means less anxiety.

For this research study, three areas were covered out of the original four CAS subscales: computer anxiety, computer confidence, and computer liking. All questions from the usefulness subscale were removed from the instrument in order to decrease the length of the survey and to accommodate the fact that the client organization was not concerned with that specific subscale. In this study, the questions were scored as follows:

1. For questions 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29: Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1.

2. For questions 2, 4, 6, 8, 10. 12, 14, 16, 18, 20, 22, 24, 26, 28, 30: Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4.

The three sub-scores obtained were:

1. Anxiety: Questions 1, 4, 7, 10, 13, 16, 19, 22, 25, 28.

2. Confidence: Questions 2, 5, 8, 11, 14, 17, 20, 23, 26, 29.

3. Liking: Questions 3, 6, 9, 12, 15, 18, 21, 24, 27, 30.

No other modification was made to the original CAS instrument. Additionally, the survey for this study included specific demographic questions.

Computer Attitude Scale (CAS) Validity/Reliability

Nash and Moroz (1997) reported that the Computer Attitude Scale (CAS) has been used in many studies. The validity and reliability of this instrument have been established in research studies of attitudes toward using the computer (Loyd & Gressard, 1984). A research survey or

scale is valid if it measures what the researcher reports it will measure and represents what it should represent. Huck and Cormier (1996) identified the fundamental word associated with validity is "accuracy". Reliability is the degree to which an instrument is accurate and true (Hair, Anderson, Tatham, & Black, 1998). Huck & Cormier (1996) associated reliability with the word "consistency".

The authors of the CAS originally identified three populations to test the reliability and validity of their instrument. Loyd and Gressard (1984) performed three validation studies. These studies tested: (a) the reliability and factorial validity of the scales, (b) correlations between the CAS subscales with other computer attitude scales, and (c) the findings of the pre/post program to identify if any change in attitudes were a result of experience or instruction. They identified at the conclusion of these studies that the subscales were stable and the CAS had validity.

The originally instrument contained three factor structure subscales: (a) liking of computers, (b) anxiety for computers, and (c) confidence in computers (Loyd & Gressard, 1984). The instrument was tested with a sample of 155 high school students. A factor analysis was performed and concluded that the solution accounted for 55% of the

variance. Reliability was reported at .91, .86, and .91 for the appropriate subscales. In 1985, a forth subscale was added, and was identified as computer usefulness (Loyd & Loyd, 1985).

In another study to determine reliability and validity, 265 adult educators were tested (Kluever, 1992). Kluever examined the internal consistency and found that the four subscales ranged from .90 on computer anxiety to .70 on computer usefulness. Cantrell (1994) performed the CAS survey with similar results of .84 for computer anxiety, .83 for computer confidence, .84 for computer liking, and .85 for computer usefulness. Although the CAS was originally designed to examine the attitudes of predominately secondary students, these two studies examined adults and established acceptable validity and reliability for this population. These two studies used adult learners and should more adequately represent adult learners in the military.

Research Questions and Hypothesis

There were 2 general questions for this study:

1. What are the attitudes of U. S. Army Reserve personnel toward computer technology for training, as measured by the Computer Attitude Scale (Loyd & Gressard,

1985) on computer anxiety, computer confidence, and computer liking?

The first question was addressed with descriptive data methods. Shavelson (1996) identified descriptive statistics as a method used to represent information and specific data.

2. Are there differences in attitudes based on: military rank, years of service, military functional area, experience using the computer, gender, and having previously taken a military course using the Internet or computer based training of U. S. Army Reserve personnel toward the computer as measure by the Computer Attitude Scale (Loyd & Gressard, 1985)?

The second general question was addressed by testing a set of hypothesis using univariate analysis of variance (ANOVA) procedures, as supported by Huck and Cormier (1996) and Shavelson (1996). Univariate ANOVA was selected instead of multivariate MANOVA because the researcher was interested in each specific variable. Additionally a univariate ANOVA has been used in other data analysis of the CAS (Gardner, Discenze, & Dukes, 1993; Loyd & Gressard, 1985; Smith, 1998)

Hypothesis for the univariate ANOVAs were:

$H_0$1: There is no significant difference among attitude sub-scale scores based on military rank.

H1: There is a significant difference among attitude sub-scale scores based on military rank.

$H_0$2: There is no significant difference among attitude sub-scale scores based on years of experience.

H2: There is a significant difference among attitude sub-scale scores based on years of experience.

$H_0$3: There is no significant difference among attitude sub-scale scores based on gender.

H3: There is a significant difference among attitude sub-scale scores based on gender.

$H_0$4: There is no significant difference among attitude sub-scale scores based on military functional area.

H4: There is a significant difference among attitude sub-scale scores based on military functional area.

$H_0$5: There is no significant difference among attitude sub-scale scores based on computer experience.

H5: There is a significant difference among attitude sub-scale scores based on computer experience.

$H_0$6: There is no significant difference among attitude sub-scale scores based on previous military training using a CD-ROM or the Internet.

H6: There is a significant difference among attitude sub-scale scores based on previous military training using a CD-ROM or the Internet.

Population and Sample

The population for this study was United States Army Reserve enlisted personnel serving in the 95th Training Division. The present number of U. S. Army personnel in the 95th Division is classified information and cannot be know or reported by the researcher. The 95th Division covers a regional area including: Arkansas, Kansas, Louisiana, Iowa, New Mexico, Missouri, Oklahoma, and Texas. The 95th Division is made up of military members including enlisted, officer, and warrant officer ranks. These members serve in numerous positions in the combat, combat service, and combat service support branches. This study was limited to enlisted personnel.

There were 180 military members from the 95th Training Division identified by the U. S. Army representative to participate in the sample. Forty-five surveys were sent to each of the enlisted ranks of: (a) Private 1 through Private 3, (b) Specialist, (c) Sergeant, and (d) Staff Sergeant. A total of 52 military members returned the survey: 21 Private 1 through Specialists, 12 Sergeants, and

19 Staff Sergeants. This is a response rate of 52 (34.61%) that were returned completed and 21 (11.60%) packets were returned undeliverable. The military members had various years of service and specific service branches. There was a variety of experience in using the computer. A few members had previously taken a military course using the Internet or a CD-ROM, but many had not.

Data Collection Procedures

The researcher requested and received permission from Dr. Doug Loyd to use the Computer Attitude Scale (see Appendix A & B). The Institutional Review Board at Oklahoma State University granted approval to conduct the study (see Appendix C). Access to the population was requested and granted through written requests through the 95th Division representative (see Appendix D). Each survey included a memorandum (see Appendix E) from the 95th Division representative outlining the: (a) purpose of the survey, (b) confidentiality of the information, (c) return instructions, (d) approximate time to complete the survey, and (e) usefulness of the study.

An appropriate sampling procedure for this study would have been a proportional stratified random sample. For operational military security reasons, however, this

sampling could not be used. The researcher did not have access to exact numbers of specific ranks. The U. S. Army representative used the database of military members and separated them based on rank. The representative provided for random selection by selecting members based on current street address. The representative provided further random selection by selecting every fifth military member until a total of 45 participants were identified from each specific rank for a total of 180.

The researcher compiled the 180 surveys in 180 envelopes that included: (a) memorandum from the 95th Division representative, (b) the survey, and (c) a return envelope. The military requested that no consent form be used or signed due to military security and anonymity requirements. No signed documents were permitted to the researcher. The researcher presented 180 sets of surveys and related documents to the division representative, who then attached addressed labels and mailed them out. The researcher had no access to the names of military members being sent surveys. In addition, there were no questions asked about names or social security numbers in this survey. No minors were used in the study. All participants had total privacy, confidentiality, and anonymity. Of the 180 mailed, 52 (34.61%) were returned completed and 21

(11.60%) packets were returned undeliverable. This is a response rate of 35% competed returns and 12% undeliverable. The data collection process was initiated on November 9, 2000, and ended on December 8, 2000.

Data Analysis

The independent variables as defined by Shavelson (1996) and Wiersma (1991) were rank, years of experience, gender, functional area, computer experience, and having previously taken a military course using a CD-ROM or the Internet. The dependant variables were computer anxiety, computer confidence, and computer liking as measured by the subscales of the CAS. A series of one-way analyses of variance were performed to analyze differences in the dependant variables on each of the independent variable. Post hoc comparisons were made with *Scheffe'* tests as supported by Glass and Stanley (1970) for groups with unequal numbers. The *Scheffe'* test is a more conservative post hoc analysis method (Huck & Cormier, 1996) than the *Tukey* alternative but is necessary in the presence of unequal groups sizes. An alpha level of .05 was applied in this study to define a statistically significant difference. Several studies have used this significance level (Barrier & Margavio 1993; Kluever, 1992; Loyd &

Gressard 1985; Smith 1998). The Alpha level .05 is one of the most commonly used probability levels (Gay, 1992; Huck & Cormier 1996; Shavelson, 1996).

The coding of independent variables was as follows:

Rank structure was coded:

1=Private 1(PV1, E-1) through Specialist (SPC, E-4).

2=Sergeant (SGT, E-5).

3=Staff Sergeant (SSG, E-6).

Years of experience was coded:

1=1 to 3 years in service.

2=4 to 8 years in service.

3=8 or more years in service.

Functional area was coded:

1=Combat Arms (CA) inclusive of Armor, Artillery, Air Defense Artillery, Infantry and the Special Forces branches.

2=Combat Support (CS) inclusive of Chemical, Corps of Engineer, Military Intelligence, Military Police, and Signal Corp.

3=Combat Service Support (CSS) inclusive of Adjutant General's Corps, Chaplin Corps, Civil Affairs, Finance Corps, JAG, Medical Services, Ordinance Corps, Quartermaster Corps, Staff Specialist Corps, and Transportation Corps.

Gender was coded:

1=Male.

2=Female.

Computer usage was coded:

1=Beginner (no experience or games only).

2=Intermediate (familiar with one to four applications, such as word processing or spreadsheet).

3=Advanced (familiar with a range of applications).

An addition question in reference to experience was whether or not military members had previously taken a military course using a CD-ROM or the Internet. This was coded: 1 for yes and 2 for no.

Summary

Attitudes of United States Army Reserve personnel toward computer technology for training were measured using the Computer Attitude Scale (Loyd & Gressard, 1985). Permission was requested and granted to use the Computer Attitude Scale. The institutional review board at Oklahoma State University also granted approval to conduct the study. The 95th Division approved permission to conduct the study with confidential and voluntary information from selected division personnel. Data was initiated and collected from 9 November 2000, and ended on 8 December

2000. Data was input into the Statistical Package for the Social Sciences (SPSS) and subjected to descriptive analysis and to a series of one-way analysis of variance followed by post hoc comparisons.

CHAPTER IV

FINDINGS OF THE STUDY

This chapter presents the following information: (a) purpose of the study, (b) research questions, and (c) summary.

Purpose of the Study

The purpose of this study was to determine attitudes of United States Army Reserve personnel toward computer technology for training. Attitudes were measured by the Computer Attitude Scale (Loyd & Gressard, 1985). Military personnel were asked to make responses to specific questions, these responses provided quantifiable scores on the following sub-scales: computer anxiety, computer confidence, and computer liking. Results of the study may provide further understanding of the attitudes of United States Army Reserve personnel toward computer technology for training, which may facilitate successful implementation of computer-based training environments.

Research Questions

General Question # 1

The first primary question was what are the attitudes of U. S. Army Reserve personnel toward computer technology for training, as measured by the Computer Attitude Scale (Loyd & Gressard, 1985) on the following subscales:

1. Computer Anxiety
2. Computer Confidence
3. Computer Liking

This question was answered using descriptive statistics.

Due to the CAS's scoring protocol, higher scores on the computer anxiety subscale were identified as a low degree of anxiety toward computers. A high score on computer confidence and computer liking identified a members' attitude being more positive on the specific subscale. Thus, for all three subscales, a high score represented a more positive attitude on a subscale. A score of more than 25 was identified as having a more positive attitude. A total score of 25 represents the neutral level between high scores and low scores on the CAS; this was identified as having a neutral attitude. A score of less than 25 on computer anxiety, confidence, or liking was identified as having a less positive attitude. This scoring

protocol is consistent with other studies (Henderson, Deane, Barrelle, & Makar, 1995; Lyod & Gressard, 1984; Smith, 1998).

Analysis of attitudes on computer anxiety was performed on 52 participants using descriptive measures of central tendency and variability. The mean for this subscale was 35.98, the median was 38.50, and the mode was 40.00. The standard deviation for this subscale was 4.94. Two members (3.85%) had a score of less than 25, identifying a higher level of anxiety. One member (1.92%) had a score of 25, identifying a neutral level of anxiety. Forty-nine (94.23%) had a score of more than 25, identifying a low level of anxiety. This data indicated that most members responded with a low level of anxiety toward computers for training.

Similar descriptive analysis of attitudes on computer confidence was made of the 52 participants. The mean for this subscale was 34.77, the median was 35.50, and the mode was 40.00. The standard deviation for this subscale was 4.93. One member (1.92%) had a score of less than 25, identifying a lower level of confidence, no member had a score of 25, and 51 (98.08%) had a score of more than 25, identifying a high level of confidence. This data indicated

that most members responded with a high level of confidence toward computers for training.

Descriptive data for attitudes on computer liking was made of the 52 participants. The mean for this subscale was 33.25, the median was 36.00, and the mode was 37.00. The standard deviation for this subscale was 4.93. Five members (9.62%) had a score of less than 25, identifying a low level of computer liking, 2 members (3.85%) had a score of 25, identifying a neutral level of anxiety, and 54 (86.53%) had a score of more than 25, identifying a higher level of liking. This data concluded the most members responded with a high level of liking toward computers for training.

General Question # 2

The second primary question was are there differences in attitudes based on: military rank, years of service, gender, military operational specialty, experience using the computer, and having previously taken a military course using the Internet or a CD-ROM of U. S. Army Reserve personnel toward the computer as measure by the Computer Attitude Scale (Loyd & Gressard, 1985).

Military Rank

A series of one-way analyses of variance using military rank as the independent variable and computer anxiety, computer confidence, and computer liking as the dependant variable were summarized (see Table 1). There were a total of 52 participants: 21 (40.4%) were identified as lower enlisted, (Private [PV1] through Specialist [SPC]), 12 (23.1%) were the rank of Sergeant, and 19 (36.5%) were the rank of Staff Sergeant. Contrary to the researcher's prediction, there was no significant difference found at the .05 alpha level for any of the three dependant variables. Thus, hypothesis 1 was not supported.

The following hypotheses were tested with one-way analysis of variance to address this question:

$H_0$1: There is no significant difference among attitudinal sub-scale scores based on military rank.

H1: There is a significant difference among attitude sub-scale scores based on military rank.

Table 1

ANOVA with Military Rank

Group	SS	Df	MS	F	P
Anxiety					
Between	59.99	2	29.99	1.24	0.30
Within	1184.99	49	24.18		
Confidence					
Between	71.07	2	35.54	1.49	0.24
Within	1169.64	49	23.87		
Liking					
Between	160.42	2	80.21	2.47	0.10
Within	1593.83	49	32.53		

Years of Service

A series of one-way analyses of variance using years of service as the independent variable and computer anxiety, computer confidence, and computer liking as the dependant variables are summarized (see Table 2). The range of military service varied from 1 year of service to 24 years of service. The mean was 9.54 and the median was 10 years of service. The standard deviation was 6.29. There were a total of 52 participants: 13 (25.0%) were identified as having between 1 and 3 years service, 9 (17.3%) were identified as having between 4 and 8 years of service, and 40 (57.7%) were identified as having more that 8 years of

service. Contrary to the researcher's prediction, there was no significant difference found at the .05 alpha level for any of the three dependant variables. Thus, hypothesis 2 was not supported.

The following hypotheses were tested with one-way analysis of variance to address this question:

$H_0$2: There is no significant difference among attitudinal sub-scale scores based on years of experience.

H2: There is a significant difference among attitude sub-scale scores based on years of experience.

Table 2

ANOVA with Years of Service

Group	SS	df	MS	F	P
Anxiety					
Between	31.70	2	15.85	0.64	0.53
Within	1213.28	49	24.76		
Confidence					
Between	53.40	2	26.70	1.10	0.34
Within	1187.31	49	24.23		
Liking					
Between	39.56	2	19.78	0.57	0.57
Within	1714.69	49	34.99		

Gender

A series of one-way analyses of variance using gender as the independent variable and computer anxiety, computer confidence, and computer liking as the dependant variables are summarized (see Table 3). There were a total of 52 participants: 39 (75%) were identified as male, 13 (25%) were identified as female. In support of the literature, there was no significant difference found at the .05 alpha level for these two variables. Thus, hypothesis 3 was not supported, and the null was retained.

The following hypotheses were tested with one-way analysis of variance to address this question:

$H_0$3: There is no significant difference among attitudinal sub-scale scores based on gender.

H3: There is a significant difference among attitude sub-scale scores based on gender.

Table 3

ANOVA with Gender

Group	SS	Df	MS	F	p
Anxiety					
Between	4.67	1	4.67	0.19	0.67
Within	1240.31	50	24.81		
Confidence					
Between	2.69	1	2.69	0.11	0.74
Within	1238.01	50	24.76		
Liking					
Between	2.83	1	2.83	0.08	0.78
Within	1751.42	50	35.03		

Military Functional Area

A series of one-way analyses of variance using military functional area as the independent variable and computer anxiety, computer confidence, and computer liking as the dependant variable are summarized (see Table 3). There were a total of 52 participants: 17 (32.7%) were identified in the combat functional area, 6 (11.5%) were identified in the combat service functional area, and 29 (55.8%) were identified in the combat service support functional area. Contrary to the literature, there was no significant difference found at the .05 alpha level for any

of the three dependant variables. Thus, hypothesis 4 was not supported.

The following hypotheses were tested with one-way analysis of variance to address this question:

$H_0$4: There is no significant difference among attitudinal sub-scale scores based on military functional area.

H4: There is a significant difference among attitude sub-scale scores based on military functional area.

Table 4

ANOVA with Military Functional Area

Group	SS	df	MS	F	p
Anxiety					
Between	33.34	2	16.67	0.67	0.51
Within	1211.64	49	24.73		
Confidence					
Between	84.73	2	42.36	1.80	0.18
Within	1155.98	49	23.59		
Liking					
Between	89.82	2	44.91	1.32	0.28
Within	1664.43	49	33.97		

Computer Experience

A series of one-way analyses of variance using computer experience as the independent variable and computer anxiety, computer confidence, and computer liking as the dependant variables were conducted (see Table 5). The 52 participants were grouped as follows: 9 (17.3%) were identified as a beginner, 32 (61.5%) were identified as intermediate, and 11 (21.2%) were identified as having advance computer experience. In support of the literature there were significant differences were found at the .05 alpha level for computer anxiety and computer confidence. Post hoc comparisons were performed to identify these differences. For computer anxiety the difference was between (a) the beginner (30.78) and (b) the intermediate (36.31) and advanced (39.27) (see Table 6). For computer confidence the difference was between beginner (30.44) and advanced (38.82) (see Table 7). Thus, hypothesis 5 was supported.

The following hypotheses were tested with one-way analysis of variance to address this question:

$H_0$5: There is no significant difference among attitudinal sub-scale scores based on computer experience.

H5: There is a significant difference among attitude sub-scale scores based on computer experience.

Table 5

ANOVA with Computer Experience

Group	SS	df	MS	F	P
Anxiety					
Between	366.37	2	183.18	10.22	0.0002*
Within	878.61	49	17.93		
Confidence					
Between	349.48	2	174.74	9.61	0.0003*
Within	891.23	49	18.19		
Liking					
Between	189.21	2	94.61	2.96	0.0610
Within	1565.04	49	31.94		

NOTE: (*) Indicates statistical significance at $p<.05$ level.

Table 6

Post Hoc Test with Computer Anxiety

Group	N	1	2
Anxiety			
Beginner	9	30.778	
Intermediate	32		36.313
Advanced	11		39.273

Table 7

Post Hoc Test with Computer Confidence

Group	N	1	2
Confidence			
Beginner	9	30.444	
Intermediate	32	34.609	34.609
Advanced	11		38.818

ANOVA with Having Taken a Course using the Internet or CD-ROM

There were a total of 52 participants: 49 (94.2%) were identified as not having taken a military course using the

Internet or computer based training, 3 (5.8%) were identified as having taken as course. Data analysis was not performed on this variable because of the extreme numeric difference between those participates that have and have not taken a military course using the Internet or a CD-ROM.

Summary

The first primary question used descriptive data to examine the subscale scores of attitudes of U. S. Army Reserve personnel. Computer anxiety scores identified two members (3.85%) had a score of less than 25, 1 member (1.92%) had a score of 25, and 49 (94.23%) had a score of more than 25. These results indicated the United States Army Reserve personnel in the 95th Training Division had a low level of anxiety toward computers for training.

Computer confidence scores of the 52 members showed 1 member (1.92%) had a score of less than 25, no member had a score of 25, and 51 (98.08%) had a score of more than 25. These data indicated that United States Army Reserve personnel in the 95th Training Division had a high level of confidence toward computers for training.

Computer liking scores of the 52 members showed 5 members (9.62%) had a score of less than 25, 2 members (3.85%) had a score of 25, and 54 (86.53%) had a score of

more than 25. These data indicated that United States Army Reserve personnel in the 95th Training Division had a high level of liking toward computers for training.

The second primary question used hypothesis testing to examine if there were statistically significant differences in the attitude subscale scores of U. S. Army Reserve personnel toward the computer as measured by the Computer Attitude Scale (Loyd & Gressard, 1985) based on the following independent variables: military rank, years of service, gender, military operation specialty, experience using the computer, and having previously taken a military course using the Internet or a CD-ROM. The dependent variables were computer anxiety, computer confidence, and computer liking. Computer experience was the only independent variable that yielded significant differences at the .05 level on the dependant variable. This variable produces significant differences on the computer anxiety and computer confidence scores. Post hoc *Scheffe'* tests were performed on these two scores. These test indicated that the computer anxiety and computer confidence score was significantly different between the beginner and advanced.

CHAPTER V

SUMMARY, CONCLUSIONS, AND REOMMENDATIONS

This chapter presents the following information: (a) summary of the study, (b) summary of the findings (c) conclusions, (d) recommendations, and (e) summary.

Summary of the Study

Computer technology for training has grown at a rapid rate. It is becoming more important for U. S. Army Reservist to improve their computer skills in order to succeed in the rapidly changing training environment. There are several studies on how the U. S. Army is integrating computer technology into the training environment (Bates, 1995; Degan & Jacob, 1998; Jelisavicac, 1998; Wisher, 1999). It is crucial that military members have a positive attitude toward computer technology for training.

Purpose of the Study

The purpose of this study was to determine attitudes of United Sates Army Reserve personnel toward computer

technology for training. Computer skills for successful military training using technology are vital. Results of the study provided further understanding of the attitudes of United Sates Army Reserve personnel toward computer technology for training. This research also added to the body of literature, providing insight into factors related to attitudes toward computer technology.

The purpose of the study was met through two major research questions:

The first research question addressed a description of attitudes of U. S. Army Reserve personnel toward computer technology for training, on the subscales of:

1. Computer Anxiety
2. Computer Confidence
3. Computer Liking

The second research question examined differences in U. S. Army Reserve personnel attitudes based on: military rank, years of service, gender, military operational specialty, experience using the computer, and having previously taken a military course using the Internet or a CD-ROM. A series of one-way analyses of variance using these variables were performed on scores on computer anxiety, computer confidence, and computer liking for the 52 military participants.

Population

The population for this study was United States Army Reserve enlisted personnel serving in the 95th Training Division. The present number of U. S. Army personnel in the 95th Division was classified information and was not known or reported by the researcher. The 95th Division covers a regional area including: Arkansas, Kansas, Louisiana, Iowa, New Mexico, Missouri, Oklahoma, and Texas.

Description of the Sample

There were 180 military members selected for the sample. Of this number, 52 military members returned the survey: 21 Privates 1 through Specialists, 12 Sergeants, and 19 Staff Sergeants.

Research Procedures

U. S. Army Reservists' attitudes were measured using the Computer Attitude Scale (CAS). This scale was designed in 1984 and updated in 1985 by Brenda H. Loyd and Clarice P. Gressard to measure attitudes toward the computer. The CAS provided scores on three subscales: computer anxiety, computer confidence, and computer liking. Demographic information was added to the survey to provide data on the

following 6 variables: military rank, years of service, gender, military operational specialty, experience using the computer, and having previously taken a military course using the Internet or CD-ROM. A total of 52 (34.61%) military members returned the survey and 21 (11.6%) survey packets were returned undeliverable. The total return rate for deliverable packets was 46.2%.

Analysis of Data

The first research question was addressed with descriptive data. Scores were computed for the three subscales using computer anxiety, computer confidence, and computer liking. Additional descriptive tabulation was performed on military rank, years of service, gender, military operational specialty, experience using the computer, and having previously taken a military course using the Internet or a CD-ROM.

The second research question examined the relationship between the three subscales in the CAS and specific demographic variables. The variables were rank, years of experience, gender, operational specialty, computer experience, and having previously taken a military course using the Internet or a CD-ROM. The second question was addressed by a set of hypotheses tested with one-way

analysis of variance (ANOVA) procedures in order to identify significant differences. When significant differences were found, a post hoc comparison was made with *Scheffe'* test.

Summary of the Findings

The three subscales in the Computer Attitude Scale are structured so the higher the scores, the more positive the attitude. A higher confidence or liking score indicated a more positive attitude on those subscales. A higher anxiety score indicated less anxiety and more positive attitude. Analyses of descriptive data on computer anxiety revealed that two participants (3.85%) had a score of less than 25, identifying a higher level of anxiety, one (1.92%) had a neutral level of 25, while 49 (94.23%) had a score of more than 25, indicating low anxiety. The mean was 35.98, and the standard deviation was 4.94.

Descriptive data on computer confidence found that one (1.92%) participant had a score of less than 25 and 51 (98.08%) had a score of more than 25. The mean for this subscale was 34.77, the standard deviation for this subscale was 4.93.

Descriptive data for attitudes on computer liking found five participants (9.62%) had a score of less than 25

and two (3.85%) had a neutral score of 25 while 54 (86.53%) had a score of more than 25. The mean for this subscale was 33.25, the standard deviation for this subscale was 4.93.

Military Rank

There were 21 participates (40.4%) identified as lower enlisted, (Private [PV1] through Specialist [SPC]), 12 (23.10%) were the rank of Sergeant, and 19 (36.5%) were the rank of Staff Sergeant. There was no significant difference found at the .05 alpha level for any of the three dependant variables. Hypothesis 1 was not supported, and the null was retained.

Years of Service

There were a total of 13 participants (25%) identified as having between one and three years of service, nine (17.3%) were identified as having between four and eight years of service, and 40 (57.7%) were identified as having more than eight years of service. There was no significant difference found at the .05 alpha level for any of the three dependant variables. Hypothesis 2 was not supported, and the null was retained.

Gender

There were a total of 39 participants (75%) identified as male, while 13 (25%) were identified as female. There was no significant difference found at the .05 alpha level for any of the three dependent variables. Hypothesis 3 was not supported, and the null was retained.

Military Functional Area

There were 17 participants (32.7%) identified in the combat functional area, six (11.5%) identified in the combat service functional area, and 29 (55.85%) identified in the combat service support functional area. There was no significant difference found at the .05 alpha level for any of the three dependant variables. Hypothesis 4 was not supported, and the null was retained.

Computer Experience

There were a total of nine participants (17.3%) identified as a beginner, 32 (61.5%) identified as intermediate, and 11 (21.20%) identified as having advanced computer experience. Significant differences were found at the .05 alpha level for computer anxiety and computer confidence. A post hoc comparison identified a difference

in computer anxiety level between (a) the beginners (30.78) and (b) the intermediates (36.31) and advanced (39.27). A post hoc comparison was also performed on computer confidence, where the difference was identified between the beginner (30.44) and advanced (38.82) groups. Hypothesis 5 was supported, and the null was rejected.

Having Taken a Military Course using the Internet or a CD-ROM

There were a total of 49 participants (94.2%) identified as not having taken a military course using the Internet or a CD-ROM, while only three (5.8%) were identified as having taken such a course. Data analysis was not performed on this variable because of the extreme numeric difference between those participates that have and have not taken a military course using the Internet or a CD-ROM.

Conclusions

The majority of U. S. Army Reserve personnel had a low level of computer anxiety and a high level of computer confidence and computer liking. The concern may not be on attitudes, but on provided adequate training and experience using computer technology for training. There was a very

low percentage of participants that had taken a military course using the Internet or a CD-ROM. A key factor is providing comprehensive training on the U. S. Army's resources and programs already in place. This may broaden the acceptance and use of these programs and resources for training.

Differences in military rank was not an important contributor toward attitudes of U. S. Army Reservist toward computer technology for training. This fact was contrary to the researcher's prediction. No conclusive reasoning can be given for the lack of significance between military ranks. Higher ranks were expected to have more training and experience using computer technology, and in turn an increased positive level of attitude. An intuitive belief is there is a greater awareness of computer technology in younger military members, because of the proliferation of computer technology. This belief may have provided for a balancing effect and contributed to the lack of differences. Additionally, if a more comprehensive sample was used, there may have been a significant difference.

The difference in years of military service was not an important contributor to attitudes of U. S. Army Reservist toward computer technology for training. This fact was also contrary to the researcher's prediction. Again, no

conclusive reasoning can be given for the lack of significance between years of service. Military rank and years of service do somewhat parallel. A reservist with a greater number of years of service was expected to have more training and experience using computer technology, and intern an increased positive level of attitude. Likewise, an intuitive belief is that younger military members have grown up in a more computer savvy environment and there is a greater awareness of computer technology in those members. Again, this may have provided for a balancing effect and contributed to the lack of differences. If a more comprehensive sample was used there may have indeed been a significant difference between years of service.

The difference in gender was not an important contributor toward attitudes of U. S. Army Reservist toward computer technology for training. This supported the findings of several other studies examining the difference in attitudes of males and females. The retention of the null hypothesis was anticipated by the researcher in this study.

The difference in military operational specialty was not an important contributor to attitudes of U. S. Army Reservist toward computer technology for training. This finding was also contrary to the researchers prediction.

Again, no conclusive reasoning can be given for the lack of significance between military operational specialties, except to suspect that military members are occasionally not performing duties in their specific functional areas. For instance an infantryman, which is in the combat arms functional area, may in fact be performing predominately administrative duties in a combat service support unit. Another possibility may be that the infantryman may be in a combat position, but that position may require considerable computer competencies. This may contribute to the lack of observed differences in computer attitudes among military operational specialties. Again, if a more comprehensive sample was used, there may have been a significant difference between military operational specialties.

A difference in computer experience was an important contributor toward attitudes of U. S. Army Reservist toward computer technology for training. This was identified by those military members who had an advanced level of computer experience, as opposed to those members identified as beginners or intermediates. The conclusion is that the level of computer experience is an important factor in predicting both level of computer anxiety and level of computer confidence. A higher level of computer experience was associated with more positive attitudes toward computer

training. This conclusion supported those of several other studies examining experience and attitudes. This conclusion was also in support of the researcher's hypothesis.

The data suggest that the main factor contributing to a positive attitude is computer experience. No other single factor significantly affected attitude. The U. S. Army Reserve should focus on provided experiences to cultivate positive attitudes toward the computer for training. Training and experience using the computer is crucial factor in the development of positive attitudes.

Recommendations

The results of this study can be used to provide the U. S. Army Reserves with information to better understand the attitudes of Reserve personnel toward computer technology for training. For instance, based on the results of this study, U. S. Army Reserve personnel with an advanced level of computer experience can be expected to have lower computer anxiety levels, have higher confidence levels, and have higher liking levels. The findings of this study showed that military members' rank, years of service, gender, operational specialty, and having previously taken a military course using the Internet or CD-ROM were not significantly related to computer attitudes. However,

further study may reveal further information about this relationship. The following are recommendation for further research:

1. This study divided military operational specialties into three groups. Further study should exam the relationship of specific operational specialties within the three reported groups. If attitudinal relationships are found within these specific operational specialties, further research can be conducted to ascertain what elements and training contribute to more positive attitudes. For instance, if specific operational specialties have more positive attitudes, it can be determined what specific training or elements contribute to those positive attitudes. This information can be used to enhance the attitudes of military members with less positive attitudes toward computer technology for training.

2. Further investigation should be conducted on the interaction of attitudinal data with information on learning style preferences, a variable not included in this study. Relationships may be examined to determine which learning style preference relates to more positive attitudes. If learning style preferences show a relationship to attitudes, computer technology for training

may be adapted to specific learners to improve the attitudes of those learners.

3. Further investigation of attitudes should be conducted on a broader sample. A further study should examine attitudes of not only lower enlisted, but that of senior enlisted, warrant officers, and officers. Such a study will provide a more comprehensive understanding of the total U. S. Army Reserve force.

4. Further investigation should be performed on how to provide adequate training and experience using computer technology for training. A key factor is providing comprehensive training on the U. S. Army's resources and programs already in place. This may broaden the acceptance and use of these programs and resources for training.

5. This study reported a dramatically disproportional number of members that have not taken a military course using the Internet or a CD-ROM. Further research should be conducted on military members that have taken courses using the Internet or a CD-ROM. Pre-test and post-test should be performed on these members to identify changes in attitudinal beliefs. Predictions on future performance may be obtained using this data. Information may be obtained at the conclusion of specific courses to identify which courses developed more positive attitudes.

This information could be used to develop comprehensive criteria for Internet or CD-ROM based training.

Summary

The United State Army Reserve is focusing more emphasis on integrating computer technology in the training environment. This strategic progression has definite advantages and disadvantages. It is important to understand the realm of possibilities and limitations of this process. Information on attitudes is a crucial element in understanding how to structure training using computer technology. A military member must possess positive attitudinal perspectives in order to adapt to the proliferation of computer technology in the training environment. This study provided information to the U. S. Army that provides a clearer understanding of attitudes of Reservists toward computer technology for training. This data will contribute to the research base in order to assist military personnel in being more successful using computer technology for training. By understanding attitudes of U. S. Army Reserve personnel, the military will be able to structure the training atmosphere to accommodate reserve members.

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APPENDIXES

APPENDIX A

REQUEST TO USE THE COMPUTER

ATTITUDE SCALE

(Excerpt from email)

Dear Dr. Loyd.

My name is Kenneth Ott I am a doctoral student in the Occupational and Adult Educational Department at Oklahoma State University. I am requesting your permission to use the Computer Attitude Scale (Loyd & Gressard, 1984) as the instrument to measure attitudes of United States Army reservist toward the computer.

Sincerely,

Kenneth D. Ott

APPENDIX B

PERMISSION TO USE THE COMPUTER ATTITUDE SCALE

Subj: Loyd/Gressard Computer Attitude Scale
Date: 1/30/01 9:24:14 PM Central Standard Time
From: del6n@virginia.edu (Doug Loyd)
To: KennyDean4@aol.com

File: Survey.doc (14848 bytes)
DL Time (53333 bps): < 1 minute

Thank you for your inquiry about the Computer Attitude Scale.

As you may know, Brenda Loyd, author of the CAS, was President of the National Council on Measurement in Education (NCME) at the time of her death in 1995. Dr. Loyd's co-author, Clarice Gressard, has asked me to handle all requests for permission to use their survey, and to provide the CAS survey and scoring protocol to researchers who wish to use their scale.

Therefore, in response to your inquiry, I am attaching a copy of the Loyd/Gressard survey of attitudes towards computers, in an MSWord document (survey.doc). If you have any problem reading it please let me know. Unfortunately I have no further information about the use of the CAS beyond that provided in this message and the attached document.

The survey is scored according to the following:

For questions 1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38 (Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1).

For questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40 (Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4).

The questions are coded so that the higher the score, the more positive the attitude.

Four subscores can also be obtained from the questions.

Anxiety: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37
Confidence: 2, 6, 10, 14, 18, 22, 26, 30, 34, 38
Liking: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39
Usefulness: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

Again, higher scores correspond to more positive attitude, e.g., a higher confidence score means more confidence and a higher anxiety score means less anxiety.

Permission is granted for use of this scale. In any publications arising from its use, please be sure to credit the authors, Brenda H. Loyd and Clarice P. Gressard.

Thanks for your interest. Best wishes.

Doug Loyd

Attachment: Survey.doc (MSWord)

Doug Loyd ITC at UVa 804-924-0629
http://www.people.virginia.edu/~del6n

---------- Headers ----------
Return-Path: <del6n@virginia.edu>
Received: from rly-yb01.mx.aol.com (rly-yb01.mail.aol.com [172.18.146.1]) by air-yb01.mail.aol.com (v77.31) with ESMTP; Tue, 30 Jan 2001 22:24:13 -0500
Received: from mail.virginia.edu (mail.virginia.edu [128.143.2.9]) by rly-yb01.mx.aol.com (v77.27) with ESMTP; Tue, 30 Jan 2001 22:22:58 -0500
Received: from neon.mail.virginia.edu by mail.virginia.edu id aa23982;
30 Jan 2001 22:20 EST
Received: from [192.168.244.160] (user239.net058.va.sprint-hsd.net [208.33.156.239])
by neon.mail.Virginia.EDU (8.9.3/8.9.3) with ESMTP id WAA08797
for <KennyDean4@aol.com>; Tue, 30 Jan 2001 22:20:54 -0500 (EST)
Date: Tue, 30 Jan 2001 22:20:06 -0500
From: Doug Loyd <del6n@virginia.edu>
To: KennyDean4@aol.com
Subject: Loyd/Gressard Computer Attitude Scale
Message-ID: <1640663472.980893206@[192.168.244.160]>
Originator-Info: login-token=Mulberry:01fXQpx+HZlf3rYnr36oOTJanhgz/k3Zcw3lB7LfI=
X-Mailer: Mulberry/2.0.5 (Win32)
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary="==========1640688022==========="

APPENDIX C

INSTITUTIONAL REVIEW BOARD

APPROVAL FORM

Oklahoma State University
Institutional Review Board

Protocol Expires: 10/22/01

Date : Monday, October 23, 2000 IRB Application No ED0142

Proposal Title: ATTITUDES OF UNITED STATES ARMY RESERVE PERSONNEL TOWARD COMPUTER TECHNOLOGY FOR TRAINING

Principal Investigator(s) :

Kenneth Ott
1900 Kickingbird Dr #41
Stillwater, OK 74074

Lynna Ausburn
235 Willard
Stillwater, OK 74078

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s) : Approved

Signature :

Carol Olson, Director of University Research Compliance

Monday, October 23, 2000
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX D

PERMISSION TO CONDUCT STUDY

WITH U. S. ARMY RESERVE

DEPARTMENT OF THE ARMY
95th Division (Institutional Training)
5316 S. Douglas Blvd.
Oklahoma City, Oklahoma 73150-9704

REPLY TO
ATTENTION OF

Kenneth D. Ott
1900 Kickingbird Drive, # 41
Edmond, OK 73034

Dear Mr. Ott

This letter confirms our agreement for you to conduct a research survey on attitudes of U. S. Army Reservist toward the use of computer technology for training in the 95th Division (Institutional Training).

If you have any questions or require further assistance, please contact the undersigned at (405) 419-1666.

Sincerely,

Lloyd Woodland
Information Management Specialist
Supervisor

APPENDIX E

MEMORANDUM AND RESPONDENT FORM

FROM THE U. S. ARMY RESERVES

DEPARTMENT OF THE ARMY
95th Division (Institutional Training)
5316 S. Douglas Blvd.
Oklahoma City, Oklahoma 73150-9704

REPLY TO
ATTENTION OF

AFRC-TOK (500)

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Computer Use for Training

1. The purpose of this survey is to collect information on the use and beliefs of reservist toward Army training using the computer. The 95th Division is interested in computer training programs and distance training using the Internet. This confidential information will be summarized to help in the design of training using the computer.

2. Please return the attached survey in the self-addressed enclosed envelope. The survey will take approximately five to ten minutes to complete. Your anonymous comments will greatly increase the 95th Divisions' ability to understand what division members think about training using the computer and how members are using computers.

Lloyd Woodland
Information Management Specialist
Supervisor

Survey of Computer use for Training in the 95th Division (Institutional Training)

Below are a series of statements. They are designed to indicate the extent to which you agree or disagree with the ideas expressed. Place a checkmark in the space under the label which is closest to your agreement or disagreement with the statements.

	Strongly Agree	*Slightly Agree*	*Slightly Disagree*	*Strongly Disagree*
1. Computers do not scare me.	☐	☐	☐	☐
2. I'm not good with computers.	☐	☐	☐	☐
3. I would like working with computers.	☐	☐	☐	☐
4. Working with a computer would make me very nervous.	☐	☐	☐	☐
5. Generally, I would feel OK trying a new problem on the computer.	☐	☐	☐	☐
6. The challenge of solving problems with computers does not appeal to me.	☐	☐	☐	☐
7. I do not feel threatened when others talk about computers.	☐	☐	☐	☐
8. I don't think I would do advanced computer work.	☐	☐	☐	☐
9. I think working with computers would be enjoyable and stimulating.	☐	☐	☐	☐
10. I feel aggressive and hostile toward computers.	☐	☐	☐	☐
11. I am sure I could do work with computers.	☐	☐	☐	☐
12. Figuring out computer problems does not appeal to me.	☐	☐	☐	☐
13. It wouldn't bother me at all to take computer courses.	☐	☐	☐	☐
14. I'm not the type to do well with computers.	☐	☐	☐	☐
15. When there is a problem with a computer run that I can't immediately solve, I would stick with it until I have the answer.	☐	☐	☐	☐
16. Computers make me feel uncomfortable.	☐	☐	☐	☐

	Strongly Agree	*Slightly Agree*	*Slightly Disagree*	*Strongly Disagree*
17. I am sure I could learn a computer language.	☐	☐	☐	☐
18. I don't understand how some people can spend so much time working with computers and seem to enjoy it.	☐	☐	☐	☐
19. I would feel at ease in a computer class.	☐	☐	☐	☐
20. I think using a computer would be very hard for me.	☐	☐	☐	☐
21. Once I start to work with the computer I would find it hard to stop.	☐	☐	☐	☐
22. I get a sinking feeling when I think of trying to use a computer.	☐	☐	☐	☐
23. I could get good grades in computer courses.	☐	☐	☐	☐
24. I will do as little work with computers as possible.	☐	☐	☐	☐
25. I would feel comfortable working with a computer.	☐	☐	☐	☐
26. I do not think I could handle a computer course.	☐	☐	☐	☐
27. If a problem is left unsolved in a computer class, I would continue to think about it afterward.	☐	☐	☐	☐
28. Computers make me feel uneasy and confused.	☐	☐	☐	☐
29. I have a lot of self-confidence when it comes to working with computers.	☐	☐	☐	☐
30. I do not enjoy talking with others about computers.	☐	☐	☐	☐
31. I am comfortable using Microsoft Word.	☐	☐	☐	☐
32. I am comfortable using Microsoft Excel.	☐	☐	☐	☐
33. I am comfortable using Microsoft Power Point.	☐	☐	☐	☐
34. I am comfortable using Microsoft Outlook.	☐	☐	☐	☐

Age: _____ Rank or GS level: _____ Years of Service: _____

Gender:..... ☐ Male ..... ☐ Female

Place a checkmark in the space which best describes you present functional area (MOS).

☐ Air Defense Artillery, Armor, Aviation, Field Artillery, Infantry, Special Forces

☐ Chemical Corps, Corps of Engineers, Military Intelligence, Military Police, Signal Corps

☐ Adjutant General's Corps, Chaplin Corps, Civil Affairs, Finance Corps, JAG, Medical Services, Ordinance Corps, Quartermaster Corps, Staff Specialist Corps, Transportation Corps

Do you use a personal computer at HOME? ☐ Yes ..... ☐ No

If yes, how long have you owned your computer?

☐ less than 1 year ☐ 1-2 years..... ☐ 2-4 years ☐ over 4 years

If no, do you have access to a computer? ..... ☐ Yes ..... ☐ No

How is this computer mainly used? (Check all that apply)

☐ Wordprocessing ☐ Spreadsheets ☐ Programming ☐ Internet ☐ Games

☐ Other (PLEASE SPECIFY)_____

Do you use a personal computer at WORK? ☐ Yes ..... ☐ No

How is this computer mainly used? (Check all that apply)

☐ Wordprocessing ☐ Spreadsheets ☐ Programming ☐ Internet ☐ Graphics

☐ Other (PLEASE SPECIFY)_____

How would you rate your *computer experience?*

☐ Beginner (no experience or games only)

☐ Intermediate (familiar with one to four applications, such as a word processing or spreadsheet)

☐ Advanced (familiar with a range of applications)

Do you have an e-mail account..... ..... ☐ Yes .....☐ No

Have you taken a military course using a CD-ROM or the Internet?.. ☐ Yes .....☐ No

Do you plan on reclassifying your functional area in the next year? .. ☐ Yes .....☐ No

Approximately how many hours per week do you spend using a computer? _____

What do you feel are advantages of distance learning using CD-ROM or the Internet?_____

_____

_____

_____

What do you feel are disadvantages of distance learning using CD-ROM or the Internet?_____

_____

_____

_____

VITA

Kenneth Dean Ott

Candidate for the Degree of

Doctor of Education

Thesis: ATTITUDES OF UNITED STATES ARMY RESERVE PERSONNEL TOWARD COMPUTER TECHNOLOGY FOR TRAINING

Major Field: Occupational and Adult Education

Biographical:

Personal Data: Born in Hinton, Oklahoma, on June 21, 1962, the son of Calvin and Alveta Ott.

Education: Graduated from Yukon High School, Yukon, Oklahoma in May of 1981; received a Bachelor of Music Education from the University of Central Oklahoma in Edmond, Oklahoma in May of 1986; received a Master of Education in Community and Junior College Teaching from the University of Central Oklahoma in Edmond, Oklahoma in May of 1988. Completed the requirements for the Doctor of Education in Occupational and Adult Education from Oklahoma State University in Stillwater in May 2001.

Experience: United States Army officer, various duty location national and internationally; pharmaceutical representative for Pfizer Pharmaceutical in Oklahoma City, Oklahoma; currently employed as assistant professor of military science at the University of Central Oklahoma in Edmond, Oklahoma and research associate at Oklahoma State University in Stillwater, Oklahoma.