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A Study of Verbal Immediacy in Army Simulator Maintenance Training

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A STUDY OF VERBAL IMMEDIACY IN ARMY SIMULATOR MAINTENANCE TRAINING

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TABLE OF CONTENTS

LIST OF TABLES

A STUDY OF VERBAL IMMEDIACY IN ARMY

SIMULATOR MAINTENANCE TRAINING

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Rapid development of computer technology has encouraged the use of computers in education; however, understanding the impact this technology has on classroom communication is just beginning. At present, no studies explore the impact computer systems (e.g., virtual reality simulation) have on verbal immediacy. This study examines the influence simulator training has on verbal immediacy and quality of instruction between students and instructors in Army maintenance training. Thirty-nine Army maintenance students in simulator and instructor-based training responded to the verbal immediacy survey designed to measure the significance of instructors' verbal immediacy behaviors as perceived by students. Overall verbal immediacy ratings were high, but no significant differences were found between instructors' verbal immediacy behaviors in the two training types. Possible reasons for the simulator ratings are explored. A second study was performed on instructors to determine the perceived effectiveness of simulator training versus instructor-based methods. Nineteen instructors completed a questionnaire comparing the two training methods, including their communication differences. The first half of the questionnaire yielded significant results on four variables of effective simulator training: replication, adequate instruction for students, full interaction with students, and effective instruction of maintenance and repair. Simulator training was not perceived as an

overall effective method of instruction. Thematic analysis of the second half of the questionnaires provided comparisons of simulator and instructor-based training, focusing on reasons for effectiveness, problems with simulator training, and communication and other differences in the two methods.

CHAPTER ONE

INTRODUCTION

The inevitability of interpersonal communication in people's lives necessitates a closer look at its use and impact. Definitions for interpersonal communication are abundant; however, at its simplest, it is communication between two individuals who have established a relationship (DeVito, 1995). Relationships inviting interpersonal communication include, but are not limited to, health, family, social, personal, educational, and organizational connections. Verbal and nonverbal messages can constitute interpersonal communication. Verbal messages are communicated through language—words, phrases, and sentences. A variety of nonverbal channels, such as gestures, facial expressions, spatial distances, and pitch of speech, are intertwined in verbal messages, or can stand alone.

One type of interpersonal relationship involving these types of messages is the student-teacher relationship. Student-teacher relationships develop through a process involving initial contact, intimacy, and dissolution (DeVito, 1986). Students and teachers are constantly engaged in communicative behaviors in order to develop their relationship (Frymier & Houser, 2000). Graham, West, and Schaller (1992) claim that teaching requires effective interpersonal communication skills. A significant portion of effectiveness results from the immediacy behaviors used by students and teachers. Therefore, immediacy, or the closeness between communicators, has become a basis for studying relationships between students and teachers in classroom settings.

Many studies, beginning with the research performed by Mehrabian, discuss attitudes with regard to immediacy. Two types of immediacy behaviors have been heavily researched: verbal and nonverbal. Verbal immediacy includes speaking behaviors, i.e., using personal examples, providing and/or inviting feedback, and using humor; nonverbal immediacy behaviors are physical, such as eye contact, smiling, movement, and body position. Most of the research revolving around immediacy describes effects on immediacy in classroom settings. Recently, classroom settings have moved online and many studies focus research on nonverbal immediacy while few focus on verbal immediacy in this environment. With the integration of computerized technology into education, students are experiencing a different educational climate. Ultimately, this new educational climate is a catalyst for change in student-teacher relationships.

Research Question

The focal point of this study centers on the impacts on verbal immediacy as perceived by students in Army maintenance training programs. Many Army bases are implementing computerized training programs; for instance, virtual reality simulation. The impact computerized training has on immediacy between students and instructors is unknown. The main research question for this study is as follows: How does the implementation of virtual reality simulators influence verbal immediacy between students and instructors in Army maintenance training? Sub-questions include:

1.) What effect does simulator training have on verbal immediacy?

2.) What effect does simulator training have on instructor-based training?

3.) What are the limitations of simulator training?

This study does not attempt to provide a detailed analysis of the benefits and detriments of virtual reality training, but rather investigates the impact of such training on verbal immediacy.

CHAPTER TWO

LITERATURE REVIEW

Literature on Immediacy

Immediacy is the degree of directness and intensity of interaction between sender and receiver, or the psychological distance between communicators (Mehrabian, 1966; Weiner & Mehrabian, 1968). Immediacy has also been described as communicative behaviors reducing social and psychological distance between individuals (Arbaugh, 2001; Mehrabian, 1971). The more direct, or immediate, the relationship between a sender and a receiver, the more positive the affect attributed toward the receiver (Mehrabian, 1966; Weiner & Mehrabian, 1968; Pease, 1972). Determining outcomes on immediacy is important because research shows immediacy behaviors influence student motivation and learning. Many studies exist examining student-teacher relationships and the consequences of their behaviors in the classroom. Mehrabian (1966) investigated the effects of immediate behavior, or immediacy, on attitudes and, over the past thirty years, communication and education scholars have studied the effects of immediacy in classrooms. Most studies on the outcomes of immediacy on student-teacher relationships are examined in traditional classrooms. Over the last few years classroom dynamics have changed incorporating online and virtual technologies. With these changes the role of teachers has been altered, transforming immediacy behaviors. Few studies examining consequences of immediacy in online education exist, and none examining virtual education exist. The studies on immediacy and virtual education presented herein provide a foundation for my investigation into immediacy and the virtual classroom.

Mehrabian (1966) investigated five types of immediacy, focusing on pairs of statements presented to thirty-two college students. Each pair of statements involved a different type of immediacy and related to positive and negative attitudes. These attitudes correlated with a degree of immediacy. The following list outlines the five types of immediacy described by Mehrabian. The pairs of statements under each are examples of the types of immediacy. These examples are based on a classroom setting. The first statement of each pair is the more immediate response.

- Type I: Referring to an object in its entirety rather than a part of the object.

  Example: "I liked the class" versus "I liked the instructor of the class"
- Type II: Relating an object to self rather than relating both self and object to a third object.

  Example: "SGT May is my instructor" versus "SGT May and I serve in the Army"
- Type III: Referring to a direct relationship between self and object rather than minimizing the degree of interaction between self and the object (i.e., through a group).

  Example: "I know the instructor" versus "Our group knows the instructor"
- Type IV: Having a direct relationship with the object rather than a mediated relationship between self and the object.

  Example: I visited SGT May" versus "I visited SGT May's office"
- Type V: Relating the object explicitly to the self rather than relating it to a group of people in which she participates.

  Example: "I should tutor PVT Smith" versus "Someone should tutor PVT Smith"

Mehrabian's findings indicated that untrained observers judge the least immediate of the two statements as more negative communication. His study heralded the bases of intuitive inferences made regarding communicator attitudes. To further Mehrabian's study, Pease (1972) attempted to repair the main problem in Mehrabian's initial experiment. This problem focused on non-

immediacy, or mediated or less direct interaction between sender and receiver, and attitudes. Pease discovered that non-immediate variants signified less positive affect towards the communication receiver. This added to Mehrabian's experiment, which showed that trained observers could infer attitudes based on immediacy variations. Pease's study concluded that non-immediate variants were rated as less positive affect towards receivers than associated immediate alternatives, and thus, became an extension of Mehrabian's experiment.

Literature on Immediacy and Student Learning

Verbal and nonverbal immediacy have been connected to student motivation and learning (Arbaugh, 2001; Christophel, 1990; Menzel & Carrell, 1999; Myers, Zhong, & Guan, 1998). Gorham (1988) identified a group of verbal immediacy behaviors related to student learning, which were similar to nonverbal immediacy behaviors. Typically, assessments of teachers' verbal behaviors to learning were based in power relationships. Gorham, however, approached her study using Mehrabian's approach-avoidance metaphor. The approach-avoidance metaphor is based on "behaviors which reduce physical or psychological distance and/or increase perceptual stimulation between and among interactants" (Gorham, 1988, p. 40). "Approach-avoidance is expressed through variations in adjectives ('This person needs help' vs. 'That person needs help), verb tense (past vs. present), and inclusivity ('we' vs 'I')" (p.42). From these concepts, Gorham produced the Immediacy Behavior Scale, which included both verbal and nonverbal immediacy behaviors, to conduct her study. In doing so, she concluded that teacher immediacy behaviors, whether verbal or nonverbal, were correlated with student learning. The Gorham Immediacy Behavior Scale has been used and adapted to many studies on immediacy and learning. In 2001, Witt and Wheeless conducted another experiment on teachers' verbal and nonverbal immediacy and students' affective and cognitive learning. Their study manipulated

combinations of verbal and nonverbal immediacy behaviors to test causal links in affective and cognitive learning. The results of their experiment coincided with other research, that is, nonverbal immediacy behaviors enhanced cognitive and affective learning. However, higher verbal immediacy, when combined with different levels of nonverbal immediacy, did not significantly enhance learning outcomes. Similarly, Sanders and Wiseman (1990) studied immediacy behaviors and learning outcomes in the multicultural classroom. Immediacy appeared to be positively associated with learning for all ethnic groups; however, the levels of association varied. Overall, the study provided that teacher immediacy behaviors enhanced student learning in the multicultural classroom.

Chesebro (2003) examined the consequences of nonverbal immediacy and clear teaching on receiver apprehension, and affective and cognitive learning. Chesebro developed the "Profile of the Clear Teacher" (p. 135), which indicates that clear teachers structure lessons and messages clearly and are also verbally clear. His study resulted in teacher clarity being a pertinent aspect of student learning, receiver apprehension, and affect. Students taught by a clear teacher learned more than students who were not taught by a clear teacher; they also experienced less apprehension and had more favorable affect for the teacher. Additionally, he found nonverbal immediacy to be insignificant on learning, although nonverbal immediacy did have an impact on students' affect for their teacher. Students' affect for their teacher plays an interesting role in student ratings of instruction. Moore, Masterson, Christophel, and Shea (1996) studied teacher immediacy and student ratings of instruction. Using Gorham's (1988) Immediacy Behavior Scale, Moore, et al. (1996) gathered data to measure the frequency of instructors' verbal and nonverbal immediacy behaviors and students' perceptions of quality of instruction. The study indicated instructors having frequent immediacy behaviors were given higher ratings by students

than those who did not. Particularly, immediacy behaviors were significant of positive ratings of faculty-student interaction. Further analysis indicated that other factors, e.g., class size, subject area, and students' expected grades, might influence immediacy scores and student ratings. Feeley (2002) conducted an experiment assessing evidence of halo effects in student evaluations of instructor communication. Students evaluated instructors by completing questionnaires measuring nonverbal immediacy, teaching effectiveness, and attitudes toward course content. Within teaching effectiveness were two irrelevant categories: vocal clarity and physical attractiveness. Feeley found inter-correlations in all five measures, concluding that the halo effect was present.

Freitas, Myers, and Avtgis (1998) examined student perceptions of instructor immediacy and the differences in these perceptions between conventional and distributed learning classrooms. While their study did not discover a significant difference in instructor verbal immediacy, it did find a significant difference in instructor nonverbal immediacy. A study by Arbaugh (2001) examined instructors' immediacy behaviors and the effect these behaviors had on student satisfaction and learning in web courses. This study found that immediacy behaviors had positive affect on both student learning and satisfaction; moreover, other factors, such as course software and length of the course, were also significant predictors.

Christophel (1990) studied the relationships among teacher immediacy behaviors, student motivation and learning. She noted that student motivation was not impacted by *what* material was taught, rather *how* students were taught the material. An assumption of the instruction-learning relationship was that behavior patterns of teachers influence behavior patterns of students (Christophel, 1990; Smith, 1979). Christophel's study determined that the relationship between student motivation and teacher immediacy resulted in increased student learning. This

study supported other research claims of the positive influence on all learning levels. Another study by Gorham and Zakahi (1990) also investigated the relationship between immediacy and learning. However, Gorham and Zakahi compared teachers' and students' perceptions, rather than only students' perceptions. The study supported previous research findings and also demonstrated that teachers' use of immediacy behaviors to student learning could be monitored. This meant that teachers were aware of their use of immediacy behaviors, and knew how to effectively monitor their behaviors and the outcomes of learning.

While most research has centered on teacher immediacy, Baringer and McCroskey (2000) studied the immediacy behaviors of students. Their study attempted to expand Rosoff's (1978) study on teachers' perceptions of student immediacy. The Baringer-McCroskey (2000) study did yield correlations substantially larger than correlations found by Rosoff, but no comparisons were significantly different in either study. The results indicated that students perceived as immediate are perceived in a positive manner by their teachers more so than students who are less immediate. Ultimately, the two studies were comparable in their findings. This combined with research on students' perceptions of teacher immediacy insinuates that students and teachers influence each other in the classroom.

Background on United States Army Culture

The United States Army was established under General George Washington who commanded a professional military force. Since that time the U.S. Army has evolved, but continues to outline its mission and culture in manuals, such as the *FM1: The Army* (2001). The *FM1* manual, which is one of only two sources for this section, provides a look into the Army as a profession. The Army today performs missions similar to those from history; however, the places and methods are drastically different. The qualities of the Army are unchanged and

include ethos of service to the nation, readiness to fight and win wars, and the willingness to accomplish any mission. Soldiers are the core of the Army and define its relationship with Americans. The Army and its soldiers are relied upon to protect and defend the Constitution and to guarantee freedom, security, and interests. Soldiers are organized, equipped and trained to fight during war and, during peacetime, they focus on conducting operations to deter war. These goals are achieved through disciplined, realistic training and a firm doctrine.

The Army as a profession centers on service, expert knowledge, unique culture and professional military ethos. Its institutional culture encompasses the customs and traditions, norms of conduct, ideas, and values that evolved from 226 years of service. The culture is historical in nature to preserve unit histories and reinforce esprit de corps and distinctiveness of vocation. Army ethos is a set of guiding beliefs, standards and ideals, which reflect professional competence. This ethos incorporates seven values that guide Army personnel: loyalty, duty, respect, selfless service, honor, integrity, and personal courage. These seven values form the foundation by which the institutional culture stands steadfast.

Part of the Army's culture includes their chain of command. This strict chain of command includes a rank structure of commissioned or enlisted membership. Violation of the chain of command is deemed fraternization and is punishable by military law (Judge Advocate General, 2002). Fraternization typically occurs when a commissioned or warrant officer engages in military equality with an enlisted member by compromising the chain of command. This violation can also occur in relationships between enlisted members of different ranks or between officers of different ranks. Personal or business relationships between commissioned and enlisted members are considered prejudicial to good order, discipline and supervisory authority, thus, compromising the chain of command and the Army core values.

One of the Army's most important duties is protecting the nation. Readiness is measured by training effectiveness and encompasses new technologies and lessons of combat. Training aims to impart to soldiers individual and collective skills, knowledge, and attributes in order to accomplish their missions. Realistic exercises assist them in effectively performing their duties under stress of military operations. Over the past few years, the U. S. Army has integrated computer-based training methods for mission preparation. Virtual reality, which is one type of computer-based method used, is outlined in the following section.

Literature on Virtual Reality and Training

The United States military has adopted non-traditional methods of training in the last few years. This training is so new that few, if any, studies exist on the effectiveness of the training. Much research has been done on virtual reality (VR) and its basic and not-so-basic components, and this review is intended to simply familiarize readers with VR technologies. Unfortunately, this review does not provide an overview of studies assessing the effectiveness of VR training. To understand the foundations of this study, however, the background of VR and VR training is necessary.

Biocca and Levy (1995) wrote *Communication in the Age of Virtual Reality*, which discusses virtual reality as a communication medium. VR is synonymous with virtual environments and simulation, and allows individuals to "surf through information-rich cyberspace; to 'be' in worlds that exist only in our imaginations, to manipulate virtual environments" (p. vii). VR also promises to go beyond the limits of physical reality, and has been characterized as the ultimate form of interaction between humans and computers (Biocca & Levy, 1995; Lanier, as cited in Rheingold, 1991; Krueger, 1991). Biocca and Levy (1995) note that VR is increasingly referred to as a communication system instead of just interface hardware

or an application. Military and space needs provoked VR developments, such as flight training and telerobotics, and the government provided monetary assistance in developing these technologies.

Steuer (1995) notes that few studies address interactivity or other similar variables because most present research is based on the technological orientations of virtual reality (McFarlane, 1991; Neuman, Crigler, Schneider, O'Donnel, & Reynolds, 1987). Changes in virtual environments directly impact communication because up-and-coming technical decisions deal with how people communicate with computers and each other (Biocca & Delaney, 1995).

Several classifications of VR exist: window, mirror, vehicle-based, and cave systems (Biocca & Delaney, 1995). In window systems, which are the crux of this study, a computer screen allows the user to explore an interactive, 3-D virtual world. Sometimes these systems include motion to simulate physical movement. According to Doxford and Judd (2002), VR simulators use computer-generated representations of digitized terrain utilizing screens. VR simulators offer noise, instrument feedback on vehicle systems, internal and external communication, motions and terrain interactions. These systems are expensive and inflexible, but are close replications of the vehicles and weapons they imitate. The main advantage of simulators noted by Doxford and Judd is that they offer increased monitoring on trainee performance. Bellman and Landauer (2000) discussed how developers know whether virtual environments are appropriate for task-orientation. Often implementation of these technologies is based on cost- and time-saving strategies by organizations. VR promises "situational realism" (p. 95), motivation, and active participation. At this point, however, it is unknown if these promises of a better learning environment are being fulfilled.

Doxford and Judd (2002) described alternatives to traditional methods of Army training, such as live or engagement simulation, VR simulation, and mechanical simulation. These authors examined the advantages and disadvantages of these alternative methods. Like others seeking alternative training methods, the Army seeks to save time, money, and resources. Kilmer (1996) noted that the increased use of simulation by the military is mostly due to budgetary reasons. In 2002, the Army began utilizing the Research Triangle Institute's (RTI) technology-assisted learning developers (Hudson, 2002). These developers include software which uses a 3-D display to simulate the interior of the Army's A-3 Bradley fighting vehicle. The purpose of these trainers is to teach soldier-mechanics maintenance and repair of the A-3. The equipment replicates the A-3 Bradley vehicles in lieu of using real vehicles. As with other VR trainers, this technique saves time and money and seems to provide a better learning environment. The next section provides a more thorough review of this training.

Hays and Vincenzi (2000) provided a look into the effectiveness of a virtual reality training system through Virtual Environment for Submarine OOD ship-handling training (VESUB). In their study, trainers and observers were polled in whether the learning experience using the VESUB system was positive. Eighty-seven percent of trainees and 100% of the observers claimed the system provided a positive learning experience. Further 92% of trainees and 99% of observers believed the VESUB system would increase the confidence in their skills. From these data, Hays and Vincenzi provided recommendations on how this technology should be used. Unfortunately, other studies like this one have either not been conducted or have yet to be published.

Army Virtual Reality Simulator Training

Currently, the test Army base uses VR simulators on desktop computers; this training is referred to as Virtual Reality Diagnostic and Troubleshooting (VR DT) training. The VR classroom has the capability to train up to eight soldiers during each term of VR DT training. The student instructor ratio is typically 6:1 in this setting, rather than the live vehicle ratio of 2:1. According to the United States Army Armor School (USAARMS) (2001), the VR DT training program was designed to provide soldier-mechanics with the basic skills and knowledge needed to effectively identify, operate, troubleshoot, and repair the Bradley fighting vehicles (BFV). The scope of these skills is vast, including familiarization with M2 A3/M3 A3 BFV inspection, service, lubrication, replacement, removal, installation, adjustment, testing, diagnosing faults within components, and controlling the BFVs. The program serves to verify that VR DT enhances retention and knowledge and skills transfer from a simulated environment to a live vehicle one. If the VR DT and live vehicle training maintain high levels of accuracy, students are apt to transition effortlessly between the two training methods. RTI (1999) describes three main functions of the VR DT trainers:

- Student familiarization with M2 A3/M3 A3 system operations and component location.
- Troubleshooting and diagnostic skills that provide full simulation. Instructors can assign specific lessons for each major system with malfunction conditions. Students' actions are monitored, errors are flagged, and student action reports are created from the VR DT.
- Training aid for the instructor since VR DT has the capability to be projected onto a screen for classroom lecture.

In an unpublished report, Talbort (2002) provided a summary noting user validation of the A3 Bradley fighting vehicle simulator trainer. Talbort found minor differences between the VR DT and live vehicle training methods in regard to task completion; however, evaluations of time and error did indicate a significant difference between the two training methods. Students participating in VR DT training completed tasks in more time and committed more errors during task completion than students participating in live vehicle training. Through observation and interviews, Talbort indicated that the dissimilar nature of the physical and virtual environments contributed to the differences in time and errors during task completion. Finally, Talbort noted that VR DT training is an efficient training tool with regard to increasing student-instructor ratios. Also, overall training time was comparable. Two students participating in live vehicle training were each able to practice the task in relatively the same time as six students practicing on the VR DT trainers. The VR DT serves well in its intended capacity of orientation and familiarization of cognitive skills. All students exhibited adequate knowledge transfer from one training method to the other. However, the VR DT trainers do not support psychomotor skills, particularly in safety, needed during live environment performance. Talbort's report did not evaluate the communicative aspects of VR DT training.

The United States military continues to add computer-based technologies to their training methods. At present the Army uses VR simulators to train soldiers for military exercises; however, little research exists on the effectiveness of this training. Currently, no research exists on the effect this training has on communication between instructors and students. According to Moore, et al. (1996), student feedback on instruction provides insight into the effectiveness of teaching. Further, a study exploring the effects computerized training has on verbal immediacy

between students and instructors serves the purpose of discovering ways to improve training techniques.

Rationale for Study

Evidence shows an understanding of teacher immediacy as a critical factor in educational practice (Gorham & Zakahi, 1990). Immediacy is shown to sway motivation and expectancies and also have an effect on learning outcomes. Communication behaviors utilized by teachers play a prominent role in student learning outcomes (Witt & Wheeless, 2001). Rapid development of computer technology has encouraged the use of computers in education and training (Howe & Rushby, 1983). These computerized systems can be highly valuable in the realm of education; however, teachers must know how to use the technology (1983). Many organizations and educational institutions are concerned with long-term effects of computerized training (Desai, 2000). Some implications of computerized training include promoting it as formal training, determining long-term effects of the training, conforming to unique learning styles of trainees, and evaluating the software interface chosen as the training system (2000).

Computerized technologies have greatly impacted the ways in which institutions educate, train, and entertain people (Bellman & Landauer, 2000). The hope behind technologically advanced classrooms, whether formal education or job training, was an environment in which humans could explore, learn, and practice skills (2000). Salomon (1992) claimed, "The computer functions like a Trojan Horse, for the activities that it affords require profound changes in the learning environment" (p. 250). In an educational sense, computers are more than an addition to the classroom. They provide students with the means for self-guided exploration through teachers' coordination of activities. Educational institutions and other organizations are realizing

the impact of these technological changes and are left wondering how effective these new training systems will be for their constituents.

Purpose of the Study

Immediacy in education and training plays a vital role in student motivation and learning outcomes. Instructors impact the learning environment by their communication behaviors, not just their knowledge impressed upon their students. Keeping this in mind, a study involving immediacy in computerized training is essential in determining the effectiveness of these new training styles. In this study, the implementation of VR simulators on training is examined through a verbal immediacy standpoint. The effects this training has on verbal immediacy between students and instructors may provide those involved with a clearer understanding of the prominent role communication plays in training. The following chapters investigate the students' perceptions of verbal immediacy behaviors by instructors in relation to both instructor-based and simulator training. In addition, the instructors' perceptions of the effectiveness between the two training types are explored.

The primary goal of this study is to determine the impact simulator training has on verbal immediacy between students and instructors. A secondary goal of this study is to evaluate instructors' perceptions of the effectiveness of simulator training as compared with instructor-based training. This investigation will analyze the results from both studies in Army maintenance training and recommend ways to improve training based on student and instructor responses. In addition, these studies may offer an explanation of the bearing simulator training has on verbal immediacy and limitations of simulator training, especially regarding communication. Further, it is not my intention to verify or nullify the Army's use of simulator training, rather to provide insight into the effectiveness of the training through a communication perspective.

CHAPTER THREE

METHODS

While both verbal and nonverbal immediacy have been discussed in the literature review, this study will analyze only verbal immediacy behaviors. Verbal immediacy was measured using an adaptation of Gorham's (1988) Immediacy Behavior Scale. Gorham created this scale through an exercise involving undergraduate students and their classroom experiences. The groups noted specific behaviors of the best teachers they had had through all their years in school. These behaviors were developed as the Immediacy Behavior Scale, which was validated by high correlations between student and trained observer reports. The adapted survey contains ten items from the verbal immediacy section of Gorham's instrument (see Appendix A for a complete list of survey questions). These ten items were chosen and revised to meet Army training provisions. Soldiers were asked to rate their perceptions of instructors' verbal immediacy during simulator training and instructor-based training.

The impact of distributed learning or web-based courses on verbal immediacy was relatively low in most studies; however, simulator training was dissimilar from these types of courses in that the instructor was not the primary educator. Students learned first from the simulator and second from the instructor during this type of training; therefore, hypothesis 1 asserted the following:

> H_1: Verbal immediacy will be negatively affected by the use of simulator training in Army maintenance instruction.

Studies showed that teacher immediacy behaviors impacted student motivation and learning, which related to teaching effectiveness. Based on this evidence, hypothesis 2 was as follows:

H_2: Verbal immediacy will have a high rating in Army maintenance training.

The instructor survey instrument provided an analysis of the effectiveness of simulator training as compared to instructor-based training using quantitative and qualitative measures. The statements and open-ended questions covered various aspects of instructors' perceptions of training methods including, but not limited to, differences between simulator training and instructor-based training and effectiveness of simulator training (see Appendix B for a complete list of survey questions). Quantitative and qualitative measurements can be complementary, and using them together is known as triangulation (Frey, Botan, & Kreps, 2000). While one offers numerical precision, the other offers useful information regarding people's perceptions. Eaves and Leathers (1991) used both quantitative and qualitative methods to study context as communication. Their study used fieldnotes, telephone interviews and coding to analyze consumer behaviors. While my study is not a replication of the Eaves and Leathers study, it is similar because of the use of both quantitative and qualitative measures. Currently no studies exist comparing the effectiveness of instructor-based training and simulator training. Research shows virtual environments directly impact how people communicate; however, the extent of this impact has not been thoroughly explored. The study by Gorham and Zakahi (1990) regarding teachers' abilities to monitor their own immediacy behaviors to enhance student learning evoked my final hypothesis. Because simulator instructors cannot monitor their immediacy behaviors as closely as live instructors can (due to the nature of simulator training) hypothesis 3 (H_3) alleged that

H_3: Instructors will rate instructor-based training as more effective than simulator training.

Instructor bias against computerized training was possible with this survey; however, this bias should have had little to no effect on the outcomes of the study. This bias was mostly attributed to resistance to changes in training, which would include computer technology used to enhance the educational environment.

Subjects and Data Collection

Random sampling would not provide a valid and reliable sample for this study because its purpose is to explore immediacy in Army maintenance training, and understand the differences in effectiveness between simulator and instructor-based training methods. While simulator training has been used in other areas of Army training, this group was the only one utilizing this type of training at the Army test base. Purposive sampling proved its reliability since this technique involved choosing participants deliberately because they possess a particular characteristic (Frey, Botan, & Kreps, 2001). In this study, soldiers and instructors were involved in simulator and instructor-based training methods in the maintenance field to provide sound data. Sengupta (1996) used purposive sampling in his study on smoking cessation between better-educated and less educated smokers. Watkins, Lichtenstein, Vest, and Thomas (1992) also used purposive sampling in a marketing study on health maintenance organizations (HMOs). While the main disadvantages of purposive sampling are potential bias and lack of generalizability of results (Frey, Botan, & Kreps, 2001), Sengupta argued that this method was commonly used by motivation researchers, particularly for communication campaigns. However, no examples of purposive sampling were found on studies of immediacy.

My research design involved questionnaires for both soldiers (students) and instructors in Army training. In the first study I planned to survey forty soldiers involved in maintenance

training at an Army training base in the Eastern United States. Soldiers who experienced instructor-based training and may or may not have participated in simulator training were surveyed. Twenty-eight soldiers were exclusive participants in instructor-based training. This group of soldiers consisted of initial entry personnel with ages averaging 18 to 20 years old. These soldiers completed eight weeks of Basic Combat Skill training, and were participating in thirteen weeks of technical training to become mechanics. Ten soldiers surveyed participated in both types of training. These soldiers completed eight weeks of basic training plus thirteen weeks of training for their Military Occupational Specialty (MOS). MOS training provides soldiers with the skills for their primary duty in the Army beyond their soldier duties. They also completed thirteen weeks of technical training in mechanics before moving into simulator training.

The second study planned to survey twenty-five instructors at the same Army training base. A few instructors taught simulator training while others taught using traditional lecture methods or live vehicle training. Instructors teaching simulator training also taught some form of instructor-based training. Instructors were either Army civilian personnel or had a military career with the Army. Data were collected from both groups in April and May 2004 during maintenance training instruction.

Procedure and Data Analyses

I constructed a written outline to follow when giving the surveys to both students and instructors (see Appendices C and D for survey outlines). The outline provided participants with instructions for completing the surveys and collecting them. It also provided a brief explanation of the purpose of the survey. The chief of the training division granted permission to conduct both surveys and encouraged students and instructors to participate in this study. I committed to

share the results of this study with the chief of the division and his colleagues, and explained that this information would be made available to the public.

Data for student surveys was analyzed using SPSS (v.11). Independent variables include simulator training and instructor-based training. Dependent variables included ten survey items rated by students on the verbal immediacy scale (e.g., addressing students by name, using humor, and providing constructive criticism). Not only did I look for the significance of verbal immediacy in Army maintenance training but also for significant differences between the verbal immediacy behaviors of the two training types. Overall immediacy ratings between the two different groups were determined by summing the dependent variables for each student, and then averaging the totals together to find the immediacy rating for each training group.

The instructor survey was separated into quantitative and qualitative sections. The first six questions were analyzed using SPSS (v.11) with the same independent variables as the student survey. Instructors who taught both types of training were placed in the simulator-training category. Dependent variables were the statements listed on the questionnaire (e.g., simulator training replication, adequate teaching, and simulator-instructor effectiveness). Part *b* of two of the first six questions and all open-ended questions were analyzed using thematic analysis. Thematic analysis is a process for encoding qualitative information (Boyatzis, 1998). This process can stand alone to analyze qualitative information (as it was used in this study), or it can be translated into quantitative data if desired. Thematic analysis is typically used when analyzing fieldnotes gained from ethnographic research methods, such as observation. Reidlinger, Gallois, McKay, and Pittam (2004) used thematic analysis to analyze perceptions of effective communication in social group processes. This study discovered themes in transcripts based on discussions by Australian Cooperative Research Centres (CRCs) professionals. While I

did not physically observe the training, the open questions on the survey were developed after observing the setting and discussions with two instructors. These questions enabled me to recognize themes, particularly from a communication perspective, present in instructors' perceptions. Similar to the Reidlinger, et al. study, any themes discovered were compared and assessed to determine the effectiveness of simulator training as compared to instructor-based training with the primary focus on communication.

CHAPTER FOUR

RESULTS

Student Survey

In this study, thirty-nine students completed the verbal immediacy survey; however, one survey was discarded because multiple answers were selected for one statement. Of the 38 completed surveys, participants of simulator training completed ten and participants of instructor-based training completed twenty-eight. Return rate for student surveys was 95% of the sample population.

The ten participants in simulator training (M = 30.6, SD=5.2) and the 28 instructor-based training participants (M = 30.4, SD=5.4) did not demonstrate a significance difference in perceptions of verbal immediacy (t[38]=.069, p=.94), however, and hypothesis 1 (H_1) was not supported. Both simulator training participants and instructor-based training participants rated verbal immediacy as relatively high. Students rated ten behaviors of verbal immediacy on a scale of 0 (Never) to 4 (Very often) with a total possible immediacy score of 40. Student perceptions of verbal immediacy in simulator training had a mean score of M = 30.6 (SD=5.2, N=10) were slightly higher than that of the instructor-based training score of M = 30.4 (SD=5.4, N=28). Due to the relatively high means, hypothesis 2—verbal immediacy will have a high rating in Army maintenance training—was supported. The mean results, which were in the top 25th percentile, signified that students were cognizant of instructors' verbal immediacy behaviors during maintenance training; thus, verbal immediacy behaviors were evident during training. All of

these results showed that simulator training instruction did not negatively affect verbal immediacy. Table 1 outlines the findings of the dependent verbal immediacy variables.

Table 1 Verbal Immediacy Perceptions by Training Method

Verbal Immediacy Behaviors	*d*	*N*	LV	Sim	χ^2	*C*
1. Use of students' names	1	38			.556	.120
Often			3	2		
Very Often			25	8		
2. Encourages questions/participation	2	38			1.6	.198
Often			6	4		
Sometimes			1	0		
Very Often			21	6		
3. Use of humor	2	38			.254	.081
Often			15	5		
Sometimes			4	1		
Very Often			9	4		
4. Use of personal experience	3	38			.410	.103
Almost Never			1	0		
Often			10	4		
Sometimes			8	3		
Very Often			9	3		
5. Provides alternative measures	4	38			6.354	.378
Almost Never			2	4		
Never			1	0		
Often			9	2		
Sometimes			10	2		
Very Often			6	2		
6. Converses with students outside of class	4	38			2.936	.268
Almost Never			1	1		
Never			2	0		
Often			8	5		
Sometimes			10	2		
Very Often			7	2		
7. Offers constructive criticism	4	38			1.707	.207
Almost Never			1	0		
Never			1	0		
Often			12	3		
Sometimes			3	2		
Very Often			11	5		
8. Offers praise	2	38			2.507	.249
Often			11	6		
Sometimes			5	0		
Very Often			12	4		

Table 1 Verbal Immediacy Perceptions by Training Method (Continued)

9. Offers unrelated discussion during class	4	38			2.588	.252
Almost Never			11	4		
Never			3	0		
Often			1	0		
Sometimes			11	4		
Very Often			2	2		
10. Calls on students	3	38			2.393	.243
Often			6	4		
Sometimes			3	2		
Very Often			19	4		

LV=Live vehicle or instructor-based training; Sim=Simulator training

As indicated in Table 1 above, the frequencies cross tabulated are not significant between type of training and the respective verbal immediacy behaviors. Further, the degree of association indicated by the contingency coefficient (*C)* was weak (less than .5) for all variables suggesting that type of training did not impact perceptions of verbal immediacy behaviors.

Instructor Survey

Nineteen instructors—twelve who had the ability to teach simulator instruction and seven who taught only by instructor-based methods—participated in this study, which included a survey and open-ended questions. The return rate of the instructor survey was 72% of the sample population. One instructor survey was discarded based on an incomplete survey. Some instructors did not complete all open-ended questions on the survey. These surveys were not discarded because the open-ended questions were based on understanding both training methods and some instructors had different levels of experience with or knowledge of the two training types. Results of the six-question survey will be presented first, followed by the results of the open-ended questions.

This content-based survey asked instructors to rate their perceptions of the effectiveness of simulator training as opposed to instructor-based training. Perceptions were rated based on a

5-point Likert scale: strongly agree, agree, neutral, disagree, or strongly disagree. Two questions, #3 and #7, had a second open-ended response to gain insight into why the instructor disagreed or strongly disagreed with the statement. The following table presents the results of the closed-ended questions.

Table 2 Perceived Effectiveness of Simulator Training by Training Method

Items	*D*	*N*	LV	Sim	χ^2	*C*
2. Simulator replicates BFV realistically	2	18			11.9**	.622
Strongly Agree			0	3		
Agree			2	9		
Neutral			5	0		
3. Students taught adequately by simulators	3	18			12.3**	.627
Strongly Agree			0	5		
Agree			2	7		
Neutral			4	0		
Disagree			1	0		
4. Simulator training allows full interaction	3	18			9.4*	.576
Strongly Agree			0	8		
Agree			5	4		
Neutral			1	0		
Disagree			1	0		
5. Simulator training teaches maintenance/ repair effectively	3	18			9.4*	.576
Strongly Agree			0	6		
Agree			2	5		
Neutral			4	1		
Disagree			1	0		
6. Simulator training is as effective as instructor training	4	18			7.3	.529
Strongly Agree			0	6		
Agree			2	3		
Neutral			3	3		
Disagree			1	0		
Strongly Disagree			1	0		
7. Simulator training allows similar communication to instructor-based training	3	18			3.6	.400
Strongly Agree			0	4		
Agree			3	4		
Neutral			3	2		
Disagree			1	2		

LV=Live vehicle or instructor-based training; Sim=Simulator training
*$p < .05$; **$p < .01$

As indicated in Table 2, the effectiveness of simulator training yielded significance on four of six variables. Instructors perceived that simulator training (a) replicates the Bradley Fighting Vehicle (BFV), $\chi^2(2, N=18)=11.9, p=.003$, (b) teaches students adequately, $\chi^2(3, N=18)=12.3$, p=.006, (c) allows instructors to have full interaction with students, $\chi^2(3, N=18)=9.4$, p=.024, and (d) teaches maintenance and repair effectively, $\chi^2(3, N=18)=9.4$, p=.024. While these variables provided significant results, they do not prove that instructors perceive simulator training as more effective than instructor-based training. Furthermore, instructors did not perceive that simulator training is as effective as instructor-based training, $\chi^2(4, N=18)=7.3$, p=.116, and they feel that it does not allow instructors to communicate with students in the same way as instructor-based methods, $\chi^2(3, N=18)=3.6$, p=.307. This suggests that instructors perceive instructor-based training as more effective than simulator training. Thus, hypothesis 3 (H_3) was supported. The contingency coefficient (C) was moderate for all variables (ranging from .4 to .627) suggesting that some relationship exists between type of training and perceptions of effectiveness.

Question 3b provided instructors with the option of describing why they disagreed or strongly disagreed with the contention that students are adequately taught during simulator training. One instructor disagreed with this statement but did not offer an explanation. However, an instructor who strongly agreed with the statement provided insight into his response. He notes that simulator training gives an instructor the advantage to monitor student progress, teach vehicle concepts, and correct students' mistakes and/or misunderstandings.

Question 7b also provided instructors with the option of describing their choice to disagree or strongly disagree. Three instructors disagreed with the statement: "Simulator training allows instructors to communicate with students the same way as in live vehicle training." Two

instructors stated that simulator training allowed closer contact with the students collectively, rather than individually as with live vehicle training. One instructor felt that simulator training did not allow the instructor to communicate "physical knowledge" (e.g., location of the devices and accurate spacing) of the BFV. These comments will be discussed further in the next section.

The open-ended responses attempted to gain insight into the similarities and differences between simulator and instructor-based training, including comparisons in communication. Several themes emerged from the data given by instructors. A response was considered a theme when three or more instructors wrote similar responses for a question. As previously mentioned, some instructors did not respond to the open-ended questions. The data collected from the open-ended questions were analyzed from a descriptive standpoint. Table 3 outlines the main themes found for each question from the data.

Table 3 Main Themes Associated with Training Method Comparisons

Items/Themes
8. Reasons why simulators effectively teach maintenance
Cost effective, no breakage of expensive vehicles
Safer than live vehicle training
Promotes group learning
Instructor control over class
Visually effective
9. Adequacy of simulator teaching
Consistent instruction, guided lessons
Part visibility and accessibility
10. Problems with simulators
Not realistically hands-on
Live orientation decreases*
Equipment malfunction
11. Communication differences
No background noise with simulator instruction*

Table 3 Main Themes Associated with Training Method Comparisons (Continued)

12. Communication similarities
Communication maintenance
13. Similarities between methods
Material consistency
14. Differences between methods
Group versus individual interaction

*Supported primarily by live vehicle/classroom instructors

As you can see from Table 3, simulator instructors rather than live-vehicle/classroom instructors supported most themes. This does not mean that live vehicle/classroom instructors did not support simulator training. It does suggest, however, that live vehicle/classroom instructors are not as familiar with the general background of simulation training methods. An assessment of these themes will be discussed in the next section.

Discussion

The implementation of VR simulators had little, if any, influence on verbal immediacy in Army maintenance instruction. Student participants offered their perceptions on the verbal immediacy behaviors of their respective training groups (e.g., simulator or live vehicle/classroom training). Overall perceptions of verbal immediacy were relatively high for both simulator and live vehicle/classroom training methods. Since simulator training involves computer instruction, it was hypothesized that this type of training would have a negative impact on verbal immediacy. However, student perceptions of verbal immediacy in the two training types did not support this claim, which likely means that few differences exist in instructors' verbal behaviors whether they teach simulator or live vehicle/classroom training. The association between type of training and verbal immediacy behaviors was very weak for all variables suggesting that the training method

did not impact students' perceptions of instructors' verbal immediacy behaviors. This supports the findings of the Freitas, Myers, and Avtgis (1998) study on student perceptions of instructor immediacy in conventional and distributed learning classrooms. Instructor verbal immediacy was not found to have significant differences between the two classrooms. These findings may also indicate that type of training does not influence instructors' uses of different communication behaviors (e.g., use of humor, use of students' names, asks questions and encourages participation) during instruction. It seems, then, that simulator training did not have an impact on verbal immediacy.

Recent literature connected immediacy and student learning; however, high verbal immediacy scores were not directly associated with enhanced learning outcomes. High verbal immediacy scores may support the idea that students perceive instructors' communication behaviors during learning, but the scores from this study cannot be associated with enhanced student learning in Army maintenance training. These scores can only suggest that students are highly cognizant of instructors' verbal communication behaviors. Some research showed that factors (i.e., class size or subject area) beyond student-instructor interaction could influence immediacy scores; however, this was not the case in this study. Training type—as a factor beyond student-instructor interaction—did not seem to influence immediacy scores by students. Perhaps an examination of nonverbal immediacy behaviors by instructors would have offered different results to support previous research findings (e.g., Freitas, Myers, & Avtgis, 1998; Witt & Wheeless, 2001).

The secondary study asked instructors to present their perspectives by comparing simulator and live vehicle/classroom instruction, including perceived effectiveness and communication differences. While instructors expressed that the simulators replicated the

Bradley Fighting Vehicle (BFV), they did not perceive that simulator training was more effective than live vehicle training or that it provided opportunities for similar ways of communicating with students. Interestingly, instructors felt that students were taught adequately during simulator training and that the simulators taught maintenance and repairs effectively. These findings contradict each other because simulators are perceived to teach the training effectively but are not perceived to have overall training effectiveness. Several reasons for this may exist. Instructors noted in their open responses that simulator training did not provide "physical knowledge" or were not realistically hands-on, had a decrease in live vehicle orientation, and had more equipment malfunctions. These comments suggested that physical knowledge and functionality of equipment are crucial for effective training.

The perceptions given by instructors regarding simulator training seemed to support the purpose of the training indicated by the USAARMS: to provide soldier-mechanics with the basic skills and knowledge needed to effectively identify, operate, troubleshoot and repair the BFV. It did not seem to support aspects of live vehicle training that are perceived as crucial to training by instructors. Simulator training does not and cannot represent the BFV completely simply because it is limited to the computer display. Also, instructors cannot communicate the size or distance of physical objects through simulator training as well as they can during live vehicle instruction. This can decrease the effectiveness of training and, as seen in these results, impact instructors' perceptions on the overall effectiveness of simulator training.

Another main problem associated with simulator training was equipment malfunction. Equipment malfunction is a basic problem for all new technologies. Communicating malfunctions to the software developers and providing them with any information contributing to the failure can alleviate this problem. Malfunctions may not be completely eliminated but

communicating possible causes to the failure can aid developers in producing a more reliable product.

Communication was not perceived to be similar between simulator and instructor-based training. Instructors did offer some communication perspectives in the open response section comparing the training types but none reflected specific problems in training. Both training methods require student-instructor verbal communication and both provide material consistency during training. The former could explain the significance of full interaction noted by instructors. However, one area of communication not mentioned by instructors was how to communicate safe maintenance and repair. Instructors indicated that simulator training was a safer way to conduct training, but they did not mention a comparison of communicating safe maintenance procedures. The inability to teach safe methods of repair or maintenance on a simulator should be recognized by instructors when considering the effectiveness of a training method. Simulator training did not seem to offer a way for instructors to communicate safety in the repair or maintenance of a vehicle. This point on safety was also noted in the Talbort (2002) report for the USAARMS on VR DT.

Instructors noted two main communication differences between simulator and instructor-based training. First, simulator training offers little background noise during instruction. This is due to the fact that simulator instruction is taught in a carpeted classroom, whereas instructor-based training is held in a bay or a tiled classroom. Second, simulator training allows instructors to teach more than one student at a time. Group learning was noted to be a strong point of simulator training because it saves time and gives instructors more control over the class. Unfortunately, live vehicle training cannot support group learning as simulator training can. A live vehicle compartment has room for only two people—the instructor and the student—leaving

the other students out of the lesson. To integrate group learning into live vehicle training, installing technology such as interactive television might be a viable option. This way, students can observe the training in the vehicle during one-on-one instruction. Ultimately, group learning seemed to be the preferred method of teaching students during instruction; however, it does not seem to influence instructors' perceptions of the effectiveness of simulator training.

The surveyed instructors proposed that simulator training has several strengths and limitations. First, simulator training is perceived as cost-effective, safe, and visually effective. It also promotes group learning and instructor control. Finally, it provides a consistent method of instruction. These factors seem to be important to instructors for having adequate and effective training methods. Noted limitations include poor live vehicle orientation, low hands-on capability, and equipment malfunction. Equipment malfunction was mentioned more often as a problem than vehicle orientation and hands-on capability. Perhaps a more reliable system would improve instructors' perceptions of the effectiveness of simulator training. Based on the findings in this study, simulator training does not have an effect on instructor-based training.

Previous research on VR indicated that virtual environments impact communication during training. While this may be true of training performed completely by a virtual environment, it is not true of the simulator training studied herein. Perhaps the difference lies in the instructor having complete control over the training given by simulators. Instructors in this study also have the option of setting specific mechanical failures for training that other virtual environments may not provide.

This study does indicate that the Army's quest to save time, money, and resources are occurring with simulator maintenance training and that instructors are supportive of new training technologies. It was hoped that this study would find differences in verbal immediacy behaviors

between students and instructors of simulator and live vehicle/classroom instruction. It was also hoped that more information regarding communication differences in training would yield areas of improvement. This study did not, however, reveal any differences in perceptions of verbal immediacy between student-instructor interactions, nor did it reveal any major communication problems perceived by instructors.

CHAPTER FIVE

CONCLUSION

Limitations

The intention of this study was to analyze both simulator and instructor-based training and be able to suggest ways to improve communication for a more effective training experience based on student and instructor perceptions. In retrospect, a pilot study on the instructor survey would have benefited this study. Based on interviews with personnel, I felt satisfied that all instructors could provide valid answers for all open-ended response questions, including the questions on communication. However, instructors with live vehicle/classroom based teaching experience were unfamiliar with the basic features of simulator training that would have assisted them in answering all of these questions. Through observation and interviews I could have gathered more data comparing the two training types, particularly from a communication perspective. Interviews would have also allowed me to explain a question misunderstood by a participant.

In the case of the student survey, I would have included statements on the effectiveness of the two training types as seen in the Gorham study. This would have permitted me to compare the perceptions of effectiveness as presented by students and instructors. Also, it would have contributed to previous studies on student learning and immediacy from an organizational training perspective, rather than a strictly educational setting. Further limitations of this project

were the size and characteristic of the samples. This narrow focus prohibited the generalizability of results for larger Army training populations.

While the data from this study did not allow me to provide recommendations for improving training, it did reveal a problem. This study was validated by its results in that instructors were either unaware or incapable of providing data on the communication aspects of training. Because communication, particularly immediacy, has been found to enhance student motivation and learning, it should be shared with instructors so they can improve their teaching methods.

Future Research

The United States Army is a unique setting to perform a study on immediacy; however, it provided a glimpse into some areas of immediacy that should be explored in future research. First, future research should aim at exploring immediacy (both verbal and nonverbal) in all Army settings to determine whether immediacy behaviors impact soldiers' performances and learning. A study comparing immediacy behaviors and differences in rank could be of benefit to see what influence, if any, rank has on immediacy.

Second, future research should focus on immediacy behaviors and gender differences of instructor-student interaction during training. The effectiveness of VR or computer-based training should be analyzed based on the gender of students and instructors. A comparison of perceptions between both genders on effectiveness may provide very different results than the ones in this study. This may prove helpful in developing multimedia used in the training classroom.

Finally, immediacy may be affected by background noise during training. In this study, low background noise was deemed a positive attribute of simulator training. A study regarding

the impact noise has on immediacy behaviors in the training classroom could be helpful. If noise impacts immediacy, it may also impact student motivation and learning. A study like this one could prove useful to ensure noise is not an obstruction to effective training. Further, conducting future research on immediacy to determine problems in communication during training can aid instructors in improving their communication skills and provide a solid foundation for using technology in the classroom from which many organizations can benefit.

Practical Application

From a practical perspective, these results provide insight into an area of training that may have been overlooked by the Army and the manufacturers of the training software. Communication plays a crucial role in training, whether it be simulated or live instruction, and understanding how the two different types of training affect communication is key in developing reliable software and capable soldiers. These results also shed light on the lack of understanding instructors have for both methods of training. While all instructors should not be required to teach using simulators, they should be knowledgeable of the fundamentals of all types of training used in their unit. The United States Army continues to advance and implement new technologies in their training. Instructors and students alike should be prepared and encouraged to engage in their expanding and changing roles in educational training.

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APPENDIX A

Student Survey[1]

I am currently training on/in ☐ simulator training ☐ live vehicle and/or classroom training

Live vehicle and/or classroom trainees should indicate how often the instructor from your previous training session did the following actions.
Simulator trainees should indicate how often their simulator instructor does the following actions.

Indicate whether your instructor 0-Never, 1-Almost never, 2-Sometimes, 3-Often, or 4-Very often does the following statements. My instructor…

1. Addresses students by name.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

2. Asks questions and encourages participation.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

3. Uses humor during training.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

4. Uses personal examples/experiences during instruction relative to training material.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

5. Provides alternatives to repairing machinery that is not noted in training materials.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

6. Converses with students before and after class.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

7. Provides constructive criticism on my individual performance.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

8. Praises students' work, actions, or comments.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

9. Has discussions unrelated to training material during class.
   0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

10. Calls on students to answer questions even if they do not raise their hands to respond.
    0-Never 1-Almost never 2-Sometimes 3-Often 4-Very often

[1] This survey instrument is adapted from the Immediacy Behavior Scale (Gorham, 1988)

APPENDIX B

Instructor Survey

Indicate whether you SA-Strongly agree, A-Agree, N-No opinion, D-Disagree, or SD-Strongly disagree with the following statements. For open-ended questions, keep responses BRIEF. If additional space is necessary, attach a separate sheet of paper to this survey and include item number with the response(s).

1. I teach ☐ Simulator training ☐ Live vehicle training ☐ Classroom training
☐ Both Simulator & live vehicle training ☐ Both live vehicle & classroom training
☐ Simulator, live vehicle, and classroom training.

2. Simulator training replicates the Bradley fighting vehicle (BFV) realistically.
1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

3a. Students are adequately taught during simulator training.
1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

3b. If you disagree or strongly disagree with this statement, give a BRIEF explanation for why you answered this way.

4. Simulator training allows instructors to fully interact with students as they would during live vehicle or classroom training.
1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

5. Simulator training is an effective way to teach maintenance and repair of BFVs.
1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

6. Simulator training is as effective as instructor training using live vehicles and/or lecture.
1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

7a. Simulator training allows instructors to communicate with students the same way as in live vehicle training.
1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

7b. If you disagree or strongly disagree with this statement, give a BRIEF explanation for why you answered this way.

8. List up to three (3) reasons why simulator training is an effective way to teach maintenance on the BFVs.

a.
b.
c.

9. List up to three (3) examples of how simulator training adequately teaches students during BFV maintenance training.

a.
b.
c.

10. List up to three (3) problems with simulator training.

a.
b.
c.

11. List up to three (3) ways communication with students in simulator training is different from communication with students in live vehicle or classroom training.

a.
b.
c.

12. List up to three (3) ways communication with students in simulator training is similar to communication with students in live vehicle or classroom training.

a.
b.
c.

13. List up to three (3) similarities between simulator training and instructor-based training.

a.
b.
c.

14. List up to three (3) differences between simulator training and instructor-based training.

a.
b.
c.

APPENDIX C

Instructions for Student Survey

The purpose of this survey is to determine the effect simulator training has on verbal immediacy between students and instructors. Immediacy is the closeness or directness of interaction between communicators. The items provided are factors of verbal immediacy behavior. The results of this study will be used to determine what, if any, effects simulator training has on verbal immediacy as compared with instructor-based training. This survey is completely voluntary and respondents may skip any question(s). Respondents are free to withdraw from this project at any time without penalty.

1. Do not write any identifying information, such as name or rank, on this survey.
2. Indicate only what type of training you are participating in at this time.
3. A. Students involved in live vehicle and/or classroom training should indicate how often the instructor from your previous training session did the following actions.

   B. Simulator trainees should indicate how often their simulator instructor does the following actions.

4. When finished, place your survey sheet in the envelope provided to the proctor.

APPENDIX D

Instructions for Instructor Survey

The purpose of this study is to evaluate the effectiveness of simulator training as compared to instructor-based training, particularly from a communication perspective. The results of this study will be used to recommend ways of improving training and note possible limitations of the training. This survey is completely voluntary and respondents may skip any question(s). Respondents are free to withdraw from this project at any time without penalty.

1. Do not write any identifying information, such as name or rank, on this survey.
2. Indicate what type(s) of training you teach.
3. For items 1 through 7 indicate your preference for the statements that follow.
4. For items 3b and 7b, provide a brief explanation of why you disagree or strongly disagree with that statement.
5. For items 8 through 14 provide a brief response indicating your opinion(s) or perception(s) of the training statement.
6. When finished, return the survey to the office of Mr. Fulkerson. The survey will be placed in an envelope.