A COMPARISON OF TWO TEACHING METHODS WITHIN A PROFESSIONAL DEVELOPMENT PROGRAM AND THE INTERACTION OF LEARNING STYLES AND THE INFLUENCE ON ACHIEVEMENT

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BIOGRAPHICAL SKETCH

Mark A. Piterski received his baccalaureate degree from Southern Connecticut State University (1989) and a Master of Arts in Education from Jersey City State College (1997). He is certified as a New Jersey Chief Public School Administrator, School Principal, Supervisor, School Business Administrator, and Substance Awareness Coordinator. Mark Piterski was an educator at Fairview Public Schools from 1990-1997.

COL Mark A. Piterski began his military career as a Private First Class in the Army National Guard as a rifleman in 1987. He attended Basic and Advanced Individual Training at Fort Benning and graduated in August 1987. He graduated from Connecticut Officer Candidate School in May 1989 and was commissioned an Infantry Officer. He graduated from Infantry Officer Basic Course in May 1990 at Fort Benning, Georgia. COL Piterski is a graduate of the Ordnance Officer Advance Course, Combined Arms Services and Staff School, Command and General Staff Officer Course, and the United States Army War College. In June 1997, he began his full time career in the New Jersey Army National Guard. COL Piterski served two combat tours in Iraq. In 2005, he served as the Operations Officer for the 42nd Division Support Command. In 2008-2009, he served as the 2-113th Infantry Battalion Commander in Southern Iraq. COL Piterski served in the Infantry Brigade Combat Team (IBCT) as the Executive Officer in 2007 and Deputy Commanding Officer in 2011. He commanded the 50th IBCT from 2012-2014. His current assignment is at Joint Base McGuire, Dix, Lakehurst as the Deputy United States Property and Fiscal Officer for the New Jersey National Guard. Mark is married to Cathy DiCicco Piterski and they have two children Dean Mark (21), and Alexis Catherine (17).

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DEDICATION

I dedicate this work to my family: wife, Cathy, son Dean and daughter Alexis. I am grateful to them for always being there for me through this journey. They have endured many family occasions without me while working on this research project. There were countless times that I struggled to finish what I started a decade ago. But with the family support you have given me, I am truly blessed. I love you and thank you Cathy, Dean, and Alexis.

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M.A.P

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LIST OF ABBREVIATIONS

1SG	First Sergeant
ADP	Army Doctrinal Publication
ADRP	Army Doctrinal Release Publication
ALC	Advanced Leader Course
ANOVA	Analysis of Variance
ARNG	Army National Guard
ATLDP	Army Training Leader Development Panel
ATP	Army Techniques Publication
CAC	Combined Arms Center
CAI	Computer Assisted Instruction
CAL	Center for Army Leadership
CASAL	Center for Army Leadership Annual Survey for Army Leadership
CBT	Computer Based Training
CCC	Captains Career Course
CGSOC	Command and General Staff Officer Course
CO CDR	Company Commander
CO XO	Company Executive Officer
DA	Department of the Army
FORSCOM	Forces Command
FM	Field Manual
JT2DC	Joint Training and Training Development Center
KLSI	Kolb Learning Style Inventory
ILE	Intermediate Level Education
LSI	Learning Style Inventory
MLR	Multi-Linear Regression
NJARNG	New Jersey Army National Guard
OBC	Officer Basic Course
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
PL	Platoon Leader
PME	Professional Military Education
PSG	Platoon Sergeant
SSD	Structured Self-Development
SL	Squad Leader
SLC	Senior Leader Course
SSI	Strategic Studies Institute
TI	Traditional Instruction
TL	Team Leader
USAWC	United States Army War College
WLC	Warrior Leader Course

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ABSTRACT

This study compared two different teaching methods [Traditional Instruction (TI), and Computer Assisted Instruction (CAI)] the interaction of learning styles, and their impact on achievement levels during an Army National Guard professional development program. The Army Leadership Manual was the basis for the instructional material throughout this study.

The study explored the leadership development in a time-constrained environment and the benefits from programs that are taught using methods that complement students' learning styles. The subjects were leaders in the New Jersey Army National Guard.

The conceptual framework was based on Kolb's learning theory and various leadership theories. The Solomon four-group experimental design was used to test the two instructional methods' effect on achievement.

In H1 Null, a t-test revealed no statistically significant differences in post scores between TI and CAI resulting in failing to reject the Null. Conversely, the H2 Null was rejected when the one way ANOVA examining differences in the post test scores between the four learning style groups achieved statistical significance. Assimilator had the highest mean score (82.85) among the four learning styles.

For H3Null, a linear regression was run to examine demographics on post scores. The test yielded a regression model that was statistically significant. However, all of the coefficients failed to achieve statistical significance. It is understandable in the context of the homogeneous nature of the sample.

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A multivariate linear regression was run for H4Null. This regression model was found to be statistically significant. However, the coefficients did not show a statistically significant contribution to post scores achievement level.

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CHAPTER 1

INTRODUCTION

Learning style research first emerged as a concept in the 1970s and since that time researchers have approached the concept of learning styles from different points of view (Williamson & Watson, 2006). According to Williamson and Watson (2006), “past studies on learning styles give attention both to how a student learns and to how a student prefers to learn.” As Rita Dunn (1984, p.12), one of the early researchers on learning styles, wrote, "Learning style is the way in which each person absorbs and retains information and/or skills; regardless of how that process is described, it is dramatically different for each person." According to Smith (1990), “using learning styles assessment instruments can provide effective assistance to teachers.” Smith (1990) states that how a student prefers to learn allows the teacher to endeavor to individual learning style with the instructional method of delivery. He further explains that, “understanding how a student prefers to learn can help the teacher lead the student in developing existing and adapting new individual learning strategies” (Smith, 1990).

The Dunn and Dunn learning style model prescribes that, “all individuals have a specific learning style and it differs from person to person, and each person has learning style strengths, or preferences, and is easier to learn through one's strengths or learning style preferences” (Dunn and Dunn, 1999; Dunn 2003). Their model illustrates that there are five types of stimuli; these include environmental, emotional, sociological, physiological, and psychological agents. Environmental elements include sound, lights, temperature and design while emotional elements are motivation, persistence, responsibility, and structure. S1ociological elements that include self, pair, peers, team, and adult with physiological

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elements include perceptual, intake, time, and mobility. Finally, psychological elements include global, analytic, hemisphericity, impulsive, and reflective (Dunn, R. & Griggs, S.A, 1995).

The Traditional Method of Instruction (TI) is the most common among professional development program in the New Jersey Army National Guard. Computer Assisted Instruction (CAI) and distance learning instruction is on the rise but only for required institutional training, not for unit development programs. Army doctrine requires each unit to conduct leader professional development programs each year. Unit leader professional development programs are conducted but generally do not reflect one's individual learning style preference or a preference of instructional methods. There have been no known studies determining if there is significant improvement in achievement level based on one's individual learning style preference or preferred teaching methods during the course of Army National Guard leader professional development programs. Therefore, this research will endeavor to provide Commanders at all levels as well as future researchers an understanding that may have an impact on future unit leader professional development programs.

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PROBLEM STATEMENT

Time is a precious commodity in the Army National Guard. There are many training requirements that must be balanced, the demands of which at times can be overwhelming. Maximizing the limited time to conduct unit professional development is a Commander's requirement, albeit a very challenging one.

The teaching method predominately used for current home station leader professional development programs is the traditional face-to-face lecture approach to learning. Is this the best way to maximize our time and gain a full understanding of Army Leadership (ADRP 6-22) with all other requirements that units must conduct? It is prudent to explore whether other methods can maximize precious time. Senior Military Officers and Non-Commissioned Officers develop the professional development program based on guidance from Superiors and the training is planned continuously throughout the year.

The concept of matching individual students learning styles with teaching methods, the so-called "matching hypotheses," is a widely proposed strategy for teaching (Dunn and Griggs, 2000). According to Dunn and Griggs (2000), it suggests that "we focus not only on the content of what is to be learned, but also on individual learning style characteristics, which should dictate the process of learning." One school of thought as defined in the literature, "propose the notion that an increase in teaching efficiency is associated with matching instructors teaching styles with learning styles." (Dunn and Griggs, 2000; Dunn, 1993) But what if we match student preferred learning styles with instructor teaching methods for required unit training including professional development programs? Will that maximize the time? Does it correlate to time conservation during an Army National Guard professional development program or, for that matter, any required training?

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There is a knowledge gap in the literature concerning unit leader professional development programs within the Army National Guard. What exists does not take into account individual learning styles prior to planning the program. The gap exists and should be explored to determine if unit leaders need to review their practices and procedures to determine the most efficient and time effective method to develop leaders. Formal "Institutional" military education for Army Leaders provides resident courses (traditional), online distance learning courses, and correspondence courses (non-traditional). Depending on the level of military education, many times leaders have a choice in determining their preferred method of receiving this instruction. From experience, this is generally not the case for unit leader professional development programs conducted at the unit level (lowest level).

It is a non-negotiable requirement that all military units both Active Duty and Reserve Component (Army National Guard and Army Reserve) conduct unit professional development programs each year. This program is in conjunction with all training requirements that is directed by a higher command known as 'Forces Command' (FORSCOM) and is similar to professional development programs for teachers. Teachers have certain requirements for licensure, to advance in their civilian education, and complete ongoing professional development as dictated by contractual agreements.

There are numerous studies with other complex organizations, e.g., the nursing field, but not the Army National Guard. According to Russell (2006), "in the day-to-day approach to educating patients, health care providers must redirect and focus their energies on assessing individual learning styles, motivation, relative past experiences, level of engagement, and willingness to apply the learning." A shared approach with the teacher and learner will maximize success and benefit everyone involved in the activity (Russell, 2006).

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The Army published a new Leadership Manual (Field Manual 6-22) in October 2006 and revisions in Army Doctrine Release Publication 6-22 in 2012. This important manual was the focus of the unit professional development program study. Particular emphasis was placed on Appendix B that focuses extensively on "Developmental Counseling." In July 2014, the Army published Army Techniques Publication (ATP) 6-22.1 'The Counseling Process' because the counseling is that important. General Daniel Allyn articulated the importance in his 2014 FORSCOM Leader Development Guidance (Allyn, 2014). The Army leadership at all levels has mandated that all military leaders understand and apply this new manual and focus placed on counseling (ATP 6.22.1, 2014).

RESEARCH QUESTIONS

RQ1: What is the best method to instruct the Army Leadership Manual (ADRP 6-22) to subjects during a time-constrained Unit Professional Development Program in the Army National Guard?

RQ2: Is a subject's individual learning style related to achievement during the Unit Professional Development Program in the Army National Guard?

RQ3: To what degree do demographics of the subjects have an effect on achievement during the Unit Professional Development Program in the Army National Guard?

RQ4: What is the relationship between teaching methods, learning styles, demographics, and achievement during the Unit Professional Development Program in the Army National Guard?

Operationalized, these research questions are translated into the following hypotheses.

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HYPOTHESES

H1Null: There is no statistical significant difference in the subjects' achievement level regardless of the teaching method (Traditional Instruction & Computer Assisted Instruction) to subjects during a time-constrained Unit Professional Development Program in the Army National Guard.

H2Null: There is no statistical significant difference in the subjects' achievement level due to individual learning style preferences from subjects in this study.

H3Null: There is no statistical significant difference in the subjects' achievement level due to demographics of subjects in this study.

H4Null: There is no statistical significant difference in the subjects' achievement level due to teaching method, learning styles, and demographics of subjects in this study.

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Figure 1 below illustrates the relationship between the four null hypotheses and the variables. From left to right; H1 is concerned with teaching methods and achievement level, H2 is concerned with teaching methods, learning styles and achievement level. H3 is concerned with teaching methods, demographics and achievement level. H4 is concerned with teaching methods, learning styles, demographics, and the achievement level.

Figure 1. Null Hypotheses and Variables

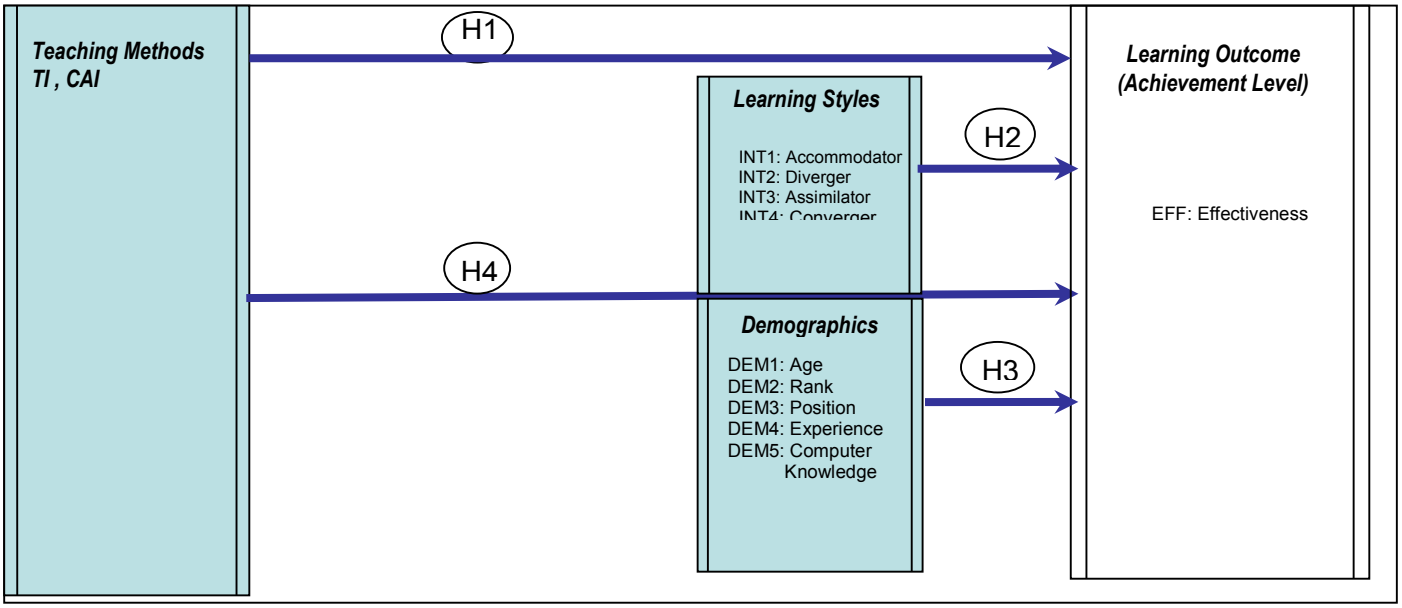

Figure 1. Graphical representation of the study's variables and how they relate to the Null hypotheses.

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CHAPTER 2

REVIEW OF THE LITERATURE

The following review of the literature demonstrates a continued need to explore the best methods to teach students. There have been numerous studies on how students learn best by accounting for learning style preferences. Previous studies outlined a primary focus on continuing this area of interest and future studies. The literature review seeks to understand how we learn, what motivate students to learn, what teaching methods are best, and how do we make learning more meaningful by focusing on the main constructs of the proposed research study: learning style, teaching style, and matching hypothesis (also commonly referred to as 'congruency').

THEORETICAL ORIENTATION & CONCEPTUAL FRAMEWORK

The theoretical orientation and conceptual framework of this study describes Kolb's learning theory, and various leadership theories. These are relevant to the proposed research concepts and relationships among the constructs. According to Jonassen & Grabowski (1993), Kolb provides perspective on both learning and development in which learning is best conceived as a process, ideas are not fixed but are formed and re-formed through experience and learning is described as a process whereby concepts are derived from, and continuously modified by experience (Jonassen & Grabowski, 1993, p. 254).

According to Claxton & Murrell (1987), Kolb supports Dewey's perspective that learning continues throughout life and is affected by the learner's experiences. In additional, every experience is interpreted within the framework of previous experiences and will modify further those experiences that are yet to come. "Kolb accepts Lewin's theory that emphasizes the importance of a learner's active participation in the learning process." (Claxton & Murrell,

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1987). Additionally, “Kolb supports the Piagetian concept that describes intelligence as a result of a learner's interaction with his environment rather than an innate characteristic within the learner.” (Claxton & Murrell, 1987)

Kolb describes the development of individuals from birth to age fifteen, sixteen to forty and, finally, forty and older. These developmental periods are defined below.

> “Kolb links learning with individual development and describes learning as the movement of a learner from simple to complex concepts. The period of the early years of a learner (from birth to age fifteen) is seen as a period of acquisition of information and skills upon which all future learning is based. Acquiring language and basic math concepts are included within this period. The next period (from about 16 to 40 years of age) is a period of learning specialization during which a learner's personal preferences directs his or her learning experiences. Within this period, students learn specific information and skills pertaining to a career, such as medical skills, accounting skills, or plumbing skills. The final period (after the age of forty) is a period of learning integration during which an individual attempts to resolve the conflict between the need for specialization and the desire for personal fulfillment. Within this period, emphasis is placed on continuing education as well as developing skills outside of the chosen profession. For example, doctors are required to stay current in research within the medical field while at the same time develop skills in other areas such as music.” (Claxton & Murrell, 1987)

Thus, according to Willcoxson & Presser (1996), “Kolb's findings support the theory that every individual draws from each of these areas to some extent, although each has a preferred learning style.” Kolb identifies four learning styles, they include: Divergers, Assimilators, Convergers, and Accommodators. Figure 1 below illustrates Kolb’s theory major constructs (Kolb, et al., 1979).

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Figure 2. Summary of Major Construct

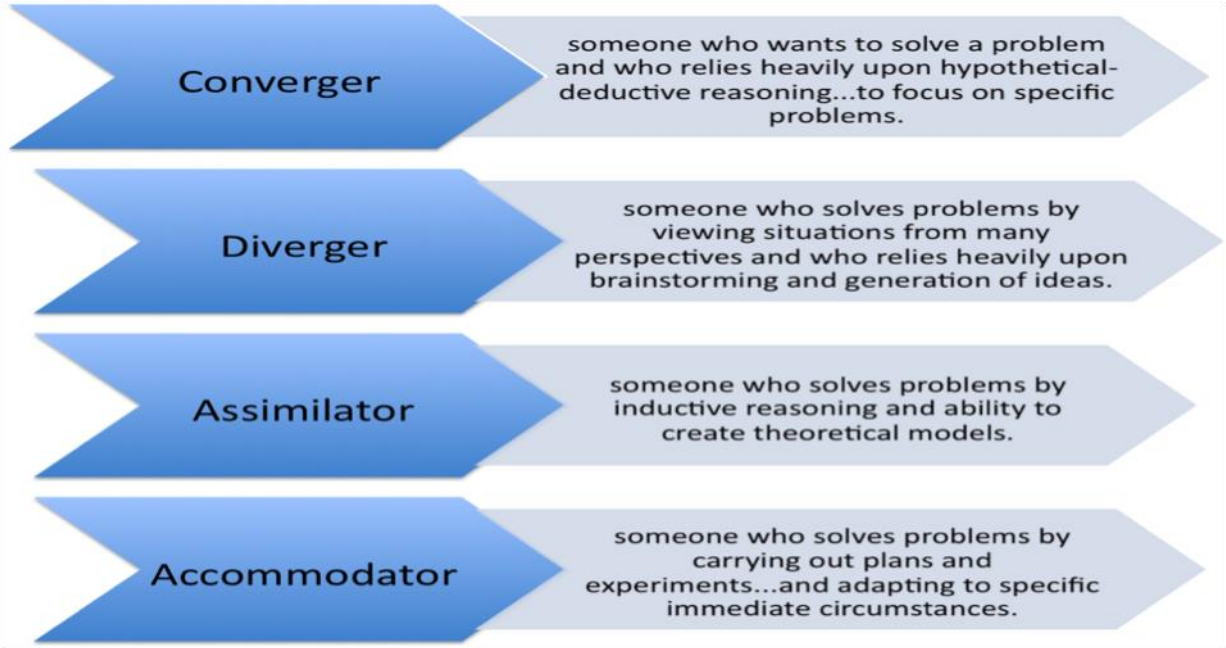

Figure 2. Accommodators are best at learning from "hands on" experience (doing and feeling). Divergers excel in using imagination and brainstorming, combining concrete experience and reflective observation (feeling and watching). Convergers' dominant learning abilities are focused on finding practical uses for ideas and theories (doing and thinking). Assimilators are most adept at logically organizing and analyzing information, building and testing theories, and designing experiments (thinking and watching) (Philbin, Meier, Huffman, & Boverie, 1995).

According Jonassen & Grabowski (1993), “within each style, learning is described from different perspectives and is determined by how someone relates socially with family and friends and by heredity, past life experiences, and the demands of the present environment." As Davis (1993), mentions that “learners within each of the four styles demonstrate preferences that grow naturally from personality characteristics and the personality types measured in the Myers-Briggs Type Indicator show a logical impact and connection to Kolb's learning style preferences.” (Davis, 1993)

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Figure 3 below graphically depicts the relationship between the independent variable (i.e., demographics, teaching method, learning styles) and the dependent variable (i.e., achievement level).

Figure 3. Independent Variables and Dependent Variables

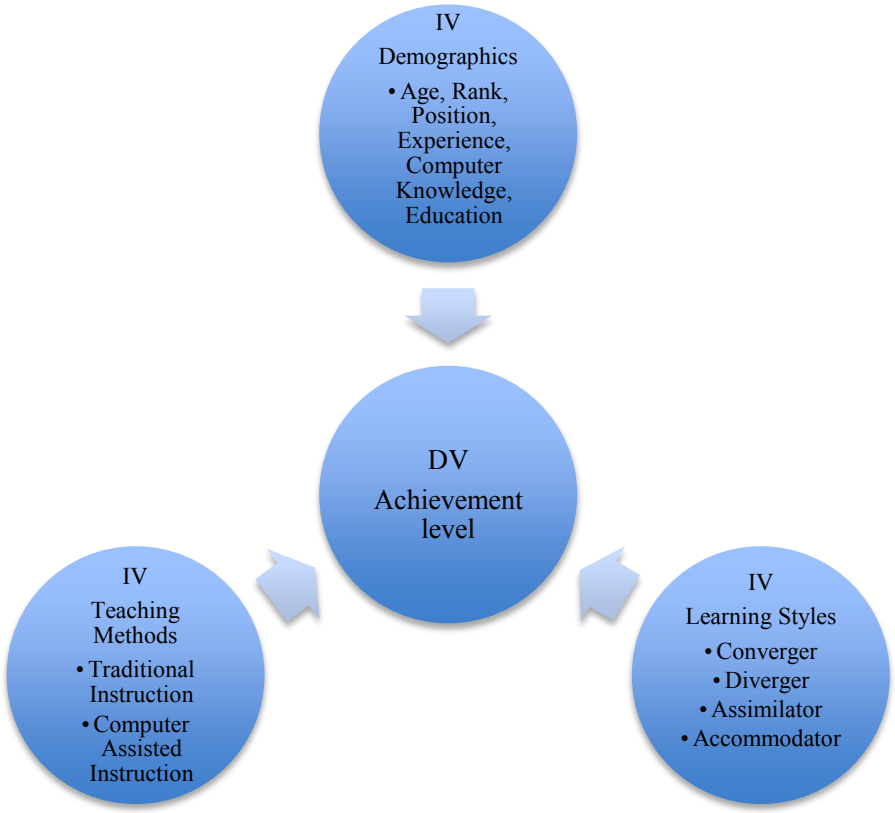

Figure 3. Represents a graphic depiction of the research study between the dependent and independent variables.

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LEARNING STYLES RESEARCH

In a 2006 research study authored by Leesa M. DiBartola and published in the Journal of Allied Health, Ms. DiBartola presented a study called, *The Learning Style Inventory Challenge: Teaching about Teaching by Learning about Learning*. "The purposes of this study were (1) to describe a model that educators can use to meet the needs of students with diverse learning styles and (2) to report participants' responses about the usefulness and applicability of the Learning Style Inventory (LSI) challenge." This study was conducted over a three year period which included 77 health care professionals and educators in which all four of the learning style inventory groups were represented. Differences in the participants' ratings of observed learning sessions were compared with their individual learning styles and the following up questionnaire, administered six months later, reported that 63 of the respondents replied that the strategies were 'highly effective', while 10 reported them 'effective'. She goes on to state, "a key to the problem of underachievement may involve students' individual learning style preferences." (DiBartola, 2006) Learning style has also been defined as "the way an individual processes, interacts with, and retains new or difficult information." (Dunn & Dunn, 1993)

DiBartola also writes that "Kolb's learning style inventory is a well-used tool that educators have used to increase their understanding of the learning process. To further this learning, educators are encouraged to move beyond understanding. We accomplished this by incorporating effective strategies to adapt learning methodologies to meet the needs of all students." (DiBartola, 2006)

Further review of the literature identified a 2004 study conducted by Boström in Scandinavia and "found positive connections between methods adapted to the students'

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individual learning style (an 'adaptive learning environment') and their learning and motivation." The study revealed that learning strategies could be developed and incorporated in adaptive learning environments. According to Boström, "being able to recognize and evaluate one's learning style is a key means of reflecting on one's own thinking processes." The study used student feedback and assessment increasing awareness for their individual learning methods of the students' strengths. The same study elaborates that "whether the learning style approach becomes a widespread innovation within Scandinavia depends on the teacher's willingness to embrace this tradition." He further acknowledges that the understanding of learning styles can give teachers the tools to identify individual traits that effectively impact achievement and give each learner the opportunity to develop through their own strengths (Boström, 2004).

While the previous few articles outlined learning styles and its importance toward future research, the next research articles consider teaching styles methods. The following articles will provide a sample of the teaching methods used and will focus on traditional methods of instructions, lecture-type, and student-centered, hands on approach.

TEACHING METHODS RESEARCH (TRADITIONAL INSTRUCTION)

Hama and Kusano (2005) authored a research article, *Teaching Radiology to Military Nursing Students*. This study illustrated that "students who showed interest and were able to provide feedback received better scores in their final examination." The study showed that lectures that were enlightening enhanced student curiosity. According to Hama and Kusano (2005), "information sources for lectures were usually a handout and a slide presentation, without other teaching techniques, and the same lecturer delivered all of the lectures throughout the entire course." The findings indicated that lecture-induced curiosity

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significantly correlated with the exam score in a radiology course. According to the authors, this study provides some evidence to support the hypothesis that interesting lectures may improve learning and enhance the performances of military nursing students. The authors also indicated a need for further research on nursing teaching methods. This suggests a need to consider the method in comparison to lecture and self-directed learning methods (Hama and Kusano, 2005).

Another study conducted by De Lorenzo and Abbott, *Effectiveness of an Adult-learning, Self-directed Model Compared with Traditional Lecture-based Teaching Methods in Out-of-hospital Training* concentrated on the adult learning model. "Adult learning may be defined as a teaching model that incorporates strategies of student self-direction toward goals of practical relevance to the learner." (Arnold, 2001) De Lorenzo and Abbott quote Grow (2002), that "adult learning generally incorporates problem or case-based learning, small-group discussions, and multi-sensory delivery of instruction." They go on to consider, "using critical thinking, integration of facts, and self-evaluation are considered important for adult learning and is considered state of the art for health education, including emergency medical services and outpatient care" (U.S. Department of Transportation, 2000). De Lorenzo and Abbott then turn to Knowles (1980) who says, "Traditional education emphasizes teacher-directed learning and generally uses non-interactive modes of teaching such as lectures and textbook readings." (De Lorenzo and Abbott, 2004)

Further, according to De Lorenzo and Abbott, "until recently, the U.S. Army Combat Medic School used a traditional teaching model with heavy emphasis on large group lectures Skills were taught separately with minimal links to didactics." De Lorenzo and Abbott's study was conducted to determine if the adult learning model improves student learning in

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cognitive performance and perception of proficiency in military medic training. The study compared traditional lecture approach to learning to self-directed methods and showed that the adult learning model had a very modest improvement in cognitive evaluation scores over traditional teaching methods (De Lorenzo and Abbott, 2004).

The following article was composed by Turner, Wilson, Gausman, and Roy (2003) at the conclusion of the 16th Military Medical Conference. The Army medical community continues to develop better methods of instructing students. The article discusses and outlines the need for alternate methods to teach medical students in the military. In their article, *Optimal Methods of Learning for Military Medical Education,* several discussions produced recommendations for teaching military medical personnel. According to Turner, Wilson, Gausman, and Roy, the environment is an important consideration when planning educational activities and poor learning environment are reduced with the effectiveness of teaching and lost learning opportunities. Locations and physical characteristics are an integral component of the learning environment and the groups explored the use of traditional educational describing attributes and challenges that were either common or unique (Turner, et al., 2003).

According to the authors,

> "The traditional educational sites or platforms found throughout the continuum of military health care education include classrooms, operational or field settings, patient care areas (e.g., bedside, clinic, office), health care treatment facilities (with fewer patients), and areas outside health care treatment facilities. Traditional educational sites have many attributes that are present in varying degrees. They provide an opportunity for modeling which is a powerful factor in teaching attitudes, communication skills, problem solving, ethical behavior, technical skills, and leadership were identified as some of the most important abilities learned through modeling. The traditional sites also enable simultaneous assessment and feedback. Even though it was recognized that there was great variability in learning styles of the students, (who are adult learners), it was noted that the sites are relatively inflexible in meeting the needs of the individual student. Capacity is another challenge at many of the sites often there are too many students, too few patients, and/or fewer opportunities for procedures."

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DISTANCE LEARNING RESEARCH (COMPUTER ASSISTED INSTRUCTION)

In a continuation of the article *Optimal Methods of Learning for Military Medical Education,* a distributed learning environment was considered from the perspective of the student, instructor, and administrator. Dr. Leon Moore of Uniformed Services University, stated "distance learning requires collaboration between subject matter experts, technical support folks, and training experts and is imperative if a good distance-achievement level is to be achieved." (Turner, Wilson, Gausman, and Roy, 2003)

> "Since there are significant differences between distributed learning methods that use one-way correspondence and two-way correspondence, they were discussed separately). Examples of one-way correspondence methods are textbooks, CD-ROM, video, on-line seminar, computer-based teaching, simulation, and virtual reality. The advantages to one-way interaction were identified as student convenience and control, and best for self-directed learner. Most methods are probably cost-effective since there is no interaction between instructor and students; however, start-up costs and technical support costs should be considered). Two-way correspondence is any hybrid of one-way interaction methods where there is either synchronous or asynchronous correspondence between the student and teacher or among the students. Examples include video teleconferencing (Hardwire, Satellite), Internet-based chat rooms (synchronous), message boards (asynchronous), video, and next generation Internet (Urick, 1994). Simulation and virtual reality, collaborative research (data collection, concurrent analysis), and Access Grid (multipoint video teleconferencing) were some of the techniques discussed." (Turner, Wilson, Gausman, and Roy, 2003)

According to the Army Training Leader Development Panel, the "Army has not yet convinced the officer corps of the benefits of distance learning." According to the panel's result, they believe "distance learning increases workload and decreases precious little personal time." Officer are concerned "that it prevents soldiers from coming together and it decreases the opportunity to interact with their peers and replaces small group instruction." The panel did indicate that "distance learning is acceptable in the field for self-directed self–development." (Army Training Leader Development Panel, 2003)

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TEACHING METHODS AND LEARNING STYLES

Finally, in the following article by Hsiao-Ching She (2005), *Promoting Students' Learning of Air Pressure Concepts: The Interrelationship of Teaching Approaches and Student Learning Characteristics,* the author explored "the potential to promote students' understanding of difficult science concepts through an examination of the interrelationships among the teachers' instructional approach, students' learning preference styles, and their levels of learning process." Dunn and Griggs (1989) suggested that when students are taught through their learning strengths, they internalize and retain knowledge more and enjoy the process better through their weaknesses. Hilgersom (1987) also advocated "that teachers be familiar with their students' learning preferences and with the teaching strategies and learning activities that are most effective in dealing with those preferences." According to Hsiao-Ching She (2005) "it is important to determine empirically whether students would gain more when their learning styles are matched with instructional styles."

Many of the researchers previously highlighted suggested that students differ widely in the way they learn (Kolb, 1984; McCarthy, 1990). Packer and Bain (1978) reported that students whose learning styles are matched with the teacher to will have greater easiness of learning than will students whose styles are not matched. However, Stahl (1999) and Tarver (1996) have argued that there is no effect with matching students' learning preference with instructional approaches. There is still a debate as to whether successful achievement level would result if students' learning styles were matched with the instructional approach. Other researchers consistently have shown that meaningful learning is more efficient and lasting, whereas rote method of learning is unlikely to produce high-quality achievement level (Novak, 1991; van Rossum & Schenk, 1984).

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Martini (1986), "demonstrated the impact of teaching middle-school science students according to their modality strengths." She also found that

> "(a) Auditory students taught by cassette tapes learned science content better, (b) visual students learned better when taught with films and reading materials, and (c) kinesthetic students learned best when taught with microcomputers. Jerkins (1991) also concluded that students' science achievement increases and attitudes toward school improve for those middle schools that introduce and persist with modality preference for instructional approaches. Jerkins' study clearly indicated that there is still a lack of consensus about whether matching students' learning modality with instructions would result in better performance."

However, Stahl (1999) and Tarver (1996) contend that the learning styles approach could be better described as a 'modality preference approach.' They argued that "there is no effect of matching students' preferences with instructional approaches and that matching students' learning styles with teachers' instructional styles would also have no effect." However, other studies have reported "that matching students' modality with instructional methods improve their science learning." (Jerkins, 1991; Martini, 1986)

It would therefore be worthwhile to conduct more empirical studies examining the effect of matching students' learning styles with instructional approaches to clarify this difference. More importantly, additional studies may provide more detailed information about how students with different learning styles learn when matched (or not) with their teachers' instructional approaches (Hsiao-Ching She, 2005).

LEADERSHIP THEORIES

Early research by Burns (1978) concluded that "leadership is one of the most observed and least understood phenomena on earth." A comprehensive study was published in July 2004 titled '*Competency Based Future Leadership Requirement*' by the U.S. Army Research Institute and Caliber Associates. This publication outlines the path to the current Army Leadership Doctrine. The study reviewed leadership theories over several decades. In

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preparation for developing an Army Leadership competency-based framework, it was imperative to review civilian research literature on leadership theories (Horey, Fallesen, Morath, Cronin, Casella, Franks Jr., & Smith, 2004). The authors go on to state,

> "Over the last five decades, researchers have constructed different theories to describe and explain various aspects of leadership. Leadership theories are important because they help clarify different perspectives. They address what leaders are, who they are, what they do, how leadership occurs, and what processes result in effective leadership. The various theories provide a backdrop for specification of leadership competencies. The main lines of theory and research address characteristics of the leader, the situations that leaders operate in, the behaviors and skills that leaders utilize, perceptions of the followers, and combinations of these and other factors."

The comprehensive study by Horey, et al. (2004) thoroughly analyzed universal traits and characteristics, the role of power, leader behavior categories, contingency models, normative decision theory, situational leadership, path-goal theory, emergent leadership, leadership attribution, leader-member exchange theory, transformational leadership, and consideration of leader relationship. The authors summarized that the, "leadership theories reviewed suggest several important, common aspects of leadership." This important study illustrates the thoroughness of their research and the evidence of which that can be viewed in current Army Leadership doctrine published in 2012 and again in 2014.

Based on the review of the literature, the dependent and independent variables were selected for this study; some are obvious, others not so much. There are many other demographic variables which could have been used in this study and are discussed in Chapter 5 vis-à-vis future research. While it might not appear obvious that deployment experience and training are related, the fact is that all individuals have been deployed received significant additional training. An example of this training is in the area of cultural awareness, much of which was computer based.

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CHAPTER 3

RESEARCH METHODOLOGY

POPULATION

The population for this study were members of the New Jersey Army National Guard. The individual Unit Leader is the primary unit of analysis. All participants are referred to as subjects.

SELECTION OF SUBJECTS

The intended subjects for this study were leaders (rank of E-5 and above) participating in the unit leadership development program. The comparison includes Traditional Instruction (TI) pretest-posttest (Group 1) with TI posttest only (Group 2); the Computer Assisted Instruction (CAI) pretest-posttest (Group 3) with CAI posttest only (Group 4).

RESEARCH DESIGN

Experimental Model

The Solomon four group design assumed that there would be one control group (in this study, that being Traditional Instruction) and an experimental treatment group each being subdivided into pre-tested subjects and non-pretested subjects. Using the Solomon 4-group method of design, all subjects were randomly assigned to one of the four groups. According to Borg and Gall (1979), this method generally controls for all major types of internal and external validity. This study was concerned with two instructional methods (treatments), TI (Control Group), CAI (Experimental Group). Table 1 below illustrates the groups, pre-and posttests, the control and experimental groups.

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Table 1

Research Design

Group Name	Pretest Observation	Treatment	Posttest Observation
Group 1 (G1)	PRE-01	C1 (TI)	POST-01
Group 2 (G2)	NO PRE-TEST	C1 (TI)	POST-02
Group 3 (G3)	PRE-02	E2 (CAI)	POST-03
Group 4 (G4)	NO PRE-TEST	E2 (CAI)	POST-04

Note. Treatment groups (G1 and G2) were taught with the traditional method of instruction; control group. Treatment groups (G3 and G4) were taught with Computer Assisted Instruction (CAI).

G1 (TI) = C1 (pre-test) - Control group one - Standard treatment *with* pre-test.

G2 (TI) = C1 (no-pretest) - Control group two - Standard treatment *without* pre-test.

G3 (CAI) = E2 (pretest) - Experimental group one - Experimental treatment group *with* pre-test.

G4 (CAI) = E2 (no-pretest) - Experimental group two - Experimental treatment group *without* pre-test.

When the data are collected, G1 and G2 are compared to ensure there are no statistically significant differences between the two groups. If *none* are found, there is no pre-test sensitization and therefore, no internal validity problems. If differences *are* found then the pre-test has influenced the outcome. The same is then completed for G3 (experimental treatment *with* pre-test) and G4 (experimental treatment *without* pre-test). No significant differences = no validity problems. Assuming no validity problems are found, G1 & G2 are combined and taken *together* as 'C' (Control Group) and compared G3 & G4, also taken *together* as 'E' (Experimental Group), and compared to each other. If any statistically significant differences occur, then it is because of the experimental treatment being introduced as all other factors have been controlled. This study found no pretest sensitization therefore allowing the collapsing of group as described above (see table, 17 p. 37).

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TREATMENT METHODS

Treatment groups (G1 and G2) were taught with the traditional method of instruction (TI); face to face instruction. This instructional method was the traditional lecture type with the instructor and students; using PowerPoint presentation with slides (minimal interaction with students). The TI method covers the same material in the other treatment group. Instruction sessions were conducted at Joint Training and Training Development Center (JT2DC) a facilities that has a distance learning center and a lecture hall. This instruction was conducted in a four hour time frame and was equal for all groups.

Treatment groups (G3 and G4) used the Computer Assisted Instruction (CAI). This method includes the computer-assisted instruction using the online training created and made available by the Center for Army Leadership (CAL). It also included a training support package made available by CAL. All face-to-face instruction was delivered by this researcher in order that equivalency of instruction was guaranteed in both content and in quality. Title of document can be found in appendix 4. A proctor was trained and supervised by this researcher which guaranteed that the instruction was consistently and correctly administered.

DATA COLLECTION PROCEDURES

Registration of Subjects

All subjects in this study filled out a participant record questionnaire form from which the following demographic data were collected: rank, military education level, civilian education level, current duty position, age, deployment experience, and computer knowledge. All subjects were then randomly assigned to one of the four-treatment groups. This random assignment was accomplished by assembling the group into a large auditorium and having them seated in front of a folder. Each folder had a group number (G1-G4) on the inside cover.

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Experience has shown that preparing the group prior to knowing "who will attend" does not take into account the complete randomness essential to the study's validity. This method helped to guarantee that last minute changes to training schedules did not impact the randomness of the group assignment and completion of all instructional material.

Data Collection

After the random assignment to groups was completed, each subjects filled out a Subjects' Records Form (Appendix). This document was the means thorough which all demographic data needed for this study was collected. Finally, the subjects then completed the Kolb Learning Style Inventory worksheet.

VARIABLES

Table 2 below illustrates the independent variables (teaching methods, learning styles, and demographics) and the dependent variable (achievement level). The table highlights the variable category, variable, level of measurement, descriptions, and the code.

Table 2

Variable Descriptions and Coding

Variable Category	Variable	Level of Measurement	Description	Code
Independent Variables				
Teaching Methods	Type of Teaching Method	Categorical	1=Traditional Instruction (TI) 2=Computer Assisted Instruction (CAI)	TM
Learning Styles	Preferred Learning Style	Categorical	1=Accommodator; 2=Diverger; 3=Assimilator; 4=Converger	LS
Demographic	Age	Continuous	Integer	DEM1

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Variable Category	Variable	Level of Measurement	Description	Code
Demographic	Rank	Categorical	1=E5; 6=O1 2=E6; 7=O2 3=E7; 8=O3 4=E8; 9=O4 5=E9	DEM2
Demographic	Position	Categorical	1=Team Leader; 2=Squad Leader; 3=Platoon Sergeant; 4=Platoon Leader; 5=Company XO; 6=Company Commander; 7=Company 1SG; 8=Battalion Staff; 9=Other	DEM3
Demographic	Experience	Dichotomous	0=Deployment 1=No Deployment	DEM4
Demographic	Computer Knowledge	Ordinal	Based on self-reported computer knowledge on scale of 1 (low) to 10 (high)	DEM5
Demographic	Military Education Level	Nominal	1=Warrior Leader Course 2=Advance Leaders Course 3=Senior Leaders Course 4=Sergeants Major Academy 5= Basic Officer Leaders Course 6=CPT Career Course/ Advance Course 7=ILE/CGSOC	DEM 6

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Variable Category	Variable	Level of Measurement	Description	Code
Demographic	Civilian Education Level	Nominal	1=GED/HS diploma 2=15-60 College Credits 3=Associates Degree 4=Baccalaureate Degree 5=Master's Degree 6=Masters +15 credits or more	DEM 7
Dependent Variable				
Achievement level	Effectiveness	Continuous	Exam Questions (%)	EFF

Note. Outlines the research questions and illustrates the relationship to the hypothesis, independent and dependent variables, and statistical testing.

TREATMENT OF DATA

This study used a number of methods to do the statistical analysis. The software program used in this study was the Statistical Package for Social Sciences (SPSS) version 22 (IBM, 2013). Prior to the full analysis, the data set was reviewed using a univariate descriptive analysis. The level of statistical significance was set at $p =< .05$.

Statistical Analysis

This study attempted to answer four research questions shown below. Table 3 illustrates the linkage between the research questions, hypotheses, independent and dependent variables, and the statistical testing and effect size.

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Table 3

Research Questions, Hypotheses, and Corresponding Variables

Research Question	**Hypothesis**	**Independent Variable(s)**	**Dependent Variable(s)**	**Statistical Test**
RQ1: What is the best method to instruct the Army Leadership Manual (ADRP 6-22) to subjects during a time-constrained Unit Professional Development Program in the Army National Guard?	H1	Teaching Method (TM)	Post Score (PS)	T-Test
RQ2: Is a subject's individual learning style related to achievement during the Unit Professional Development Program in the Army National Guard?	H2	Learning Style (LS)	Post Score (PS)	ANOVA
RQ3: To what degree do demographics of the subjects have an effect on achievement during the Unit Professional Development Program in the Army National Guard?	H3	Demographics Age (Age) Rank (Rank) Position (Pos) Deployment (Exp) Computer Knowledge (Tech) Military Education (MILED) Civilian Education (CIVED)	Post Score (PS)	Multiple Linear Regression
RQ4: What is the relationship between teaching methods, learning styles, demographics, and achievement during the Unit Professional Development Program in the Army National Guard?	H4	Teaching Methods (TM) Learning Styles (LS) Demographics	Post Score (PS)	Multivariate Linear Regression

Note. Research Questions, Independent Variables, Dependent Variable, and Statistical Test.

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Many statistics textbooks present a point of view that is common among the social sciences, i.e., that the Type I error rate, must be kept at or below .05, and that, if at all possible, the Type II error rate, be kept low as well. "Statistical power," which is equal to 1 - ß, must be kept correspondingly high. Ideally, the level of power should be at least .80 to detect a reasonable departure from the null hypothesis (StatSoft, 2008).

Chapter 4 will illustrate the data collected and its associated statistical power and effect size. A series of post hoc power analyses and effect size will demonstrate that the total sample size satisfies the power necessary for relevancy using the subjects' data in this study.

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CHAPTER 4

DATA ANALYSIS AND PRESENTATION OF RESULTS

INTRODUCTION

As stated previously, this study compared two different teaching methods within an Army National Guard Professional Development Program and the interaction of learning styles and the influence on achievement level. The data set for all 119 subjects was complete as each subject finished all modules of the required training either through Traditional Instruction (TI; 58 Subjects) or Computer Assisted Instruction (CAI; 61 Subjects). The ages of the subjects ranged from 20-54 years and their learning style preferences among the subjects were fairly equally distributed between the four identified style (Accommodator, Diverger, Assimilator, and Converger). An analysis of the descriptive statistics supports the conclusion that the study group data set represents a normal distribution. All data were entered into and analyzed using IBM SPSS version 22.

DESCRIPTIVE STATISTICS

Overview. Tables 4 illustrates the measures of central tendency for all of the 119 subjects that completed all requirements and for which data was collected. The subjects' pre-score mean was 68.62 with a standard deviation of 9.732 and a post-test mean of 79.32 with a standard deviation of 9.052. The median and mode for the pre-test 70 and 75 respectively while the median and mode for the post test was 70 and 82, respectively. Both tests had a maximum score of 100. The pre-score range was 41 with a minimum of 49, a maximum of 90 and a variance of 94.720. The post-score had a range of 42, a minimum of 54, a maximum of 96 and a variance 81.931.

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Table 4

Measures of Central Tendency

	N	Range	Min.	Max.	Mean	Mode	Median	SD	Var.
Pre-Score	47	41	49	90	68.62	75	70	9.732	94.72
Post-Score	119	42	54	96	79.32	82	79	9.052	81.931

Table 5 identifies the statistics associated with the dependent variables (i.e., pre- and post-test scores) and those of the multiple independent variables (i.e., training methods, demographics, and learning styles). The table illustrates the number of subjects, range, minimum, maximum, mean, standard deviation, variance, skewness, and kurtosis for the independent variables of age, civilian education, military education, military rank, military position, preferred learning styles, deployment, and computer knowledge.

Table 5

Continuous Variables

	N	Range	Minimum	Maximum	Mean	Std. Error
Pre-Score	47	41	49	90	68.62	1.42
Post-Score	119	42	54	96	79.32	0.83
Age	119	34	20	54	32.77	0.643
Computer Knowledge	119	4	6	10	7.76	0.088

	Std. Deviation	Variance	Skewness	Std. Error	Kurtosis	Std. Error
Pre-Score	9.732	94.720	-0.071	0.347	-0.622	0.681
Post-Score	9.052	81.931	-0.414	0.222	0.289	0.440
Age	7.016	49.228	0.843	0.222	0.609	0.440
Computer Knowledge	0.963	0.927	0.490	0.222	-0.515	0.440

Age. As depicted by Table 6 the youngest subject was 20 years of age and the oldest 54. The average age was 32.77.

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Table 6

Age Frequencies

	N	Min.	Max.	Mean	Std. Deviation
Age	119	20	54	32.77	7.016
Valid N (listwise)	119				

Civilian Education. As described in Table 7, only 13 of 119 subjects earned no college credits while 12 only earned an associate degree. Of the remainder 42 earned baccalaureate degrees, and 3 held graduate degrees.

Table 7

Civilian Education Frequency

	Frequency	Percent	Cumulative Percent
GED/HS Diploma	13	10.9	10.9
0-60 College Credits	49	41.2	52.1
Associates Degree	12	10.1	62.2
Baccalaureate Degree	42	35.3	97.5
Master's Degree	3	2.5	100.0
Total	119	100.0	

Military Education. Table 8 illustrates the seven levels of military education also known as Professional Military Education (PME). Army service members must complete training in various content areas to advance in position and rank. Non-Commissioned Officers (i.e., NCO ranks E5 through E9) must successfully complete the first four courses listed in the table (i.e., Warrior Leader, Advanced Leader, Senior Leader, and Sergeants Major Academy). In a separate training track are the courses Commissioned Officers (O1 through O4) must complete to be eligible for promotion (Basic, Captains' Career, and Intermediate Level Education).

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Table 8

Military Education Frequency

	Frequency	Percent	Cumulative Percent
Warrior Leader Course	20	16.8	16.8
Advanced Leaders Course	39	32.8	49.6
Senior Leaders Course	21	17.6	67.2
Sergeants Major Academy	1	0.8	68.1
Basic Officer Leaders Course	30	25.2	93.3
Captains' Career Course	7	5.9	99.2
ILE / CGSOC	1	0.8	100.0
Total	119	100.0	

Military Rank. Table 9 depicts the military rank structure of the 119 subjects who participated in this study. It is important to note that this professional development study was conducted for leaders from the rank of E5 (i.e., Sergeant) through O4 (i.e., Major). The ranks below E5 (i.e., E-1 Private through E4 Specialists) were not included in the study because the course content emphasized Developmental Counseling Techniques which are normally associated with these rank. Having previously completed equivalent training, Officers at the rank of O5 or higher were not included. As illustrated in Table 10 below, the majority of subjects are E5 through E7, and O1 and O2. This distribution of rank is proportionally accurate at the level of organization for this study.

Table 9

Military Rank Frequency

Rank	Frequency	Percent	Cumulative Percent
E5	20	16.8	16.8
E6	37	31.1	47.9
E7	18	15.1	63.0
E8	4	3.4	66.4
E9	1	0.8	67.2

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Table 9 (continued)

Military Rank Frequency

Rank	Frequency	Percent	Cumulative Percent
O1	14	11.8	79.0
O2	15	12.6	91.6
O3	7	5.9	97.5
O4	3	2.5	100.0
Total	119	100.0	

Table 10 illustrates that the majority of the military positions held by subjects are in the first four categories and range from Team Leader to Platoon Leader; 93 of the 119 total. These are the most important positions influencing soldiers within these ranks and where mentoring and developmental counseling are most advantageous and are encouraged. Therefore, it can be seen that as the instructional material is focused on Army Leadership at the level of first line leaders the subjects under study were appropriate as the target audience.

Table 10

Military Position Frequency

	Frequency	Percent	Cumulative Percent
Team Leader	20	16.8	16.8
Squad Leader	37	31.1	47.9
Platoon Sergeant	19	16.0	63.9
Platoon Leader	17	14.3	78.2
Company XO	5	4.2	82.4
Company Commander	3	2.5	84.9
Company 1st Sergeant	4	3.4	88.2
Battalion Staff	14	11.8	100.0
Total	119	100.0	

Preferred Learning Styles. Table 11 depicts the breakdown of the 119 subjects' preferred learning styles and shows an almost an equal breakdown of the four learning

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modalities. Thirty subjects were classified as 'Accommodators' (i.e., those learn best by "doing and feeling") while 33 subjects were labeled 'Divergers' (i.e., those that learn best by "feeling and watching"). There were also 26 subjects that are 'Assimilator' (i.e., those that learn best by "thinking and watching") while 30 subjects were labeled Convergers (i.e., those that learn best by "doing and thinking"). A complete discussion of these learning styles can be found in Chapter 1 ("Summary of Major Construct.").

Table 11

Preferred Learning Styles Frequency

	Frequency	Percent	Cumulative Percent
Accommodator	30	25.2	25.2
Diverger	33	27.7	52.9
Assimilator	26	21.8	74.8
Converger	30	25.2	100.0
Total	119	100.0	

Deployment. Table 12 shows the number of subjects among those tested that have been deployed for an overseas contingency operation in order to determine whether deployment overseas does or does not influence achievement level. Individuals that deployed receive additional training especially in the area of cultural awareness. This raises the subjects' awareness to the multicultural aspect of organizations and particularly those in the area in which soldiers are being deployed. The majority of this study group had been deployed and previously received this additional education. Specifically, 95 subjects were previously deployed and while 24 were not, equating to approximately 80% and 20% respectively.

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Table 12

Deployment Frequency

	Frequency	Percent	Cumulative Percent
No Deployment	24	20.2	20.2
Deployment	95	79.8	100.0
Total	119	100.0	

Computer Knowledge. Table 13 illustrates the range of subjects' computer skills and highlights the fact that the subjects tested had intermediate to advanced levels of technical knowledge. The fact that none of the subjects indicated that they were beginners or novices (i.e., most having experience using computer) was important because of the two training method required the use of the computer. Of the 119 subject, 114 individuals rated themselves 'Intermediate +' to 'Advanced +' as annotated on the subjects 'record form.

Table 13

Computer Knowledge Frequency

Computer Knowledge Value	Label	Frequency	Percent	Cumulative Percent
1	None	0	0.0	0.0
2	Low -	0	0.0	0.0
3	Low	0	0.0	0.0
4	Low +	0	0.0	0.0
5	Intermediate -	0	0.0	0.0
6	Intermediate	5	4.2	4.2
7	Intermediate +	52	43.7	47.9
8	Advanced -	33	27.7	75.6
9	Advanced	24	20.2	95.8
10	Advanced +	5	4.2	100.0
	Totals	119	100.0	

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Teaching Methods. Table 14 illustrates the number of subjects in each of the two training methods. The random assignment of subject into groups resulted in 61 subjects attending the traditional instructed classes (i.e., TI), while 58 subjects utilized the computer assisted instruction method (i.e., CAI).

Table 14

Teaching Methods Frequency (TI and CAI)

	Frequency	Percent	Cumulative Percent
Traditional Instruction (TI)	58	48.7	48.7
Computer Assisted Instruction (CAI)	61	51.3	100.0
Total	119	100.0	

Pre-Score. The range for these pre-test scores was 49 to 90 on a scale of 100. The mode of these scores is 75, which occurred eight times.

Post-Score. Table 15 illustrates the post-score range and training method frequency of all 119 subjects. The range for the post-test score was 54 to 96 on a scale of 100. A score of 82 occurred 20 times and was most frequent outcome.

Table 15

Post-Score by Training Method Frequency

Post-Score	Training Method		Total
	Traditional Instruction	Computer Assisted Instruction	
54	1	1	2
55	0	1	1
58	0	1	1
65	3	2	5
68	6	4	10
72	2	5	7
75	6	12	18
79	7	12	19
82	13	7	20
84	1	0	1

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Table 15 (continued)

Post-Score by Training Method Frequency

Post-Score	Training Method		Total
	Traditional Instruction	Computer Assisted Instruction	
85	1	0	1
86	5	8	13
93	4	1	5
96	2	4	6
	58	61	119

Table 16 illustrates the post-score range and learning styles preference frequency of all 119 subjects. The preferences are close to equally distributed (Accommodator=30, Diverger=33, Assimilator=26, Converger=30).

Table 16

Post-Score and Preferred Learning Style Frequency

	Preferred Learning Style				
Post-Score	Accommodator	Diverger	Assimilator	Converger	Total
54	0	1	0	1	2
55	0	1	0	0	1
58	1	0	0	0	1
65	2	2	0	1	5
68	5	3	1	1	10
72	1	4	0	2	7
75	5	5	6	2	18
79	5	4	5	5	19
82	8	4	4	4	20
84	0	0	0	1	1
85	0	1	0	0	1
86	2	3	3	5	13
89	0	4	2	4	10
93	1	1	1	2	5
96	0	0	4	2	6
	30	33	26	30	119

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Pearson Product Moment Correlation Matrix

Table 17 shows a Pearson Product Moment Correlation (i.e., one-tailed Pearson r) for all the study's variables.

Pre-Score Correlation. The matrix indicates correlation between the 47 subjects that were pre-tested and their post-test scores (r=.328, sig .012). In addition, there is a correlation with computer knowledge with an r =.292, sig. =.023.

Post-Score Correlation. The matrix indicates a correlation with pre--score r=.328, sig. =.012, and computer knowledge with r=.345, sig. =.000.

Table 17

Pearson Product Moment Correlation.

		Pre-Score	Post-Score	Age	Computer Knowledge
Pre-Score	Pearson Correlation	1	.328*	.084	.292*
	sig. (1-tailed)		.012	.287	.023
	N	47	47	47	47
Post-Score	Pearson Correlation	.328*	1	-.007	.345**
	sig. (1-tailed)	.012		.472	.000
	N	47	119	119	119
Age	Pearson Correlation	.084	-.007	1	-.470**
	sig. (1-tailed)	.287	.472		.000
	N	47	119	119	119
Computer Knowledge	Pearson Correlation	.292*	.345*	-.470*	1
	sig. (1-tailed)	.023	.000	.000	
	N	47	119	119	119

Research Questions Outcomes

Research Question 1. T-Test. Tables 18 through 21 illustrate the results of the T-Test for H1Null. An independent samples t test revealed a statistically non-significant difference in Post Scores between Traditional Instruction subjects M = 80.28 (8.91) and Computer Assisted

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Instruction subjects M = 78.41 (9.17), with (117) = 1.125, p = .263; the 95% CI of the mean difference 1.866 is (-1.42, 5.15). The TI group did not outperform CAI subjects to a statistically significant degree. Therefore, the H1Null was not rejected.

Table 18

Group Statistics

	Training Method	N	Mean	Std. Deviation	Std. Error Mean
Post-Score	Traditional Instruction	58	80.28	8.908	1.170
	Computer Assisted Instruction	61	78.41	9.166	1.174

Table 19

Independent Sample Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
Post-Score	Equal variances assumed	0.014	0.907	1.125	117.000
	Equal variances not assumed			1.126	116.941

Table 20

T-test for Equality of Means

		Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower
Post-Score	Equal variances assumed	0.263	1.866	1.658	-1.418
	Equal variances not assumed	0.262	1.866	1.657	-1.416

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Table 21

T-test for Equality of Means

		t-test for Equality of Means 95% Confidence Interval of the Difference Upper
Post-Score	Equal variances assumed	5.150
	Equal variances not assumed	5.148

Research Questions 2. ANOVA. Tables 22 through 24 illustrate a One Way ANOVA that examined the difference in the Post Test Scores between the four Learning Style groups (Accommodator, Diverger, Assimilator, and Converger), yielding a statistical significant result with F = 4.093 p = .008. There are statistical significant differences in the subjects' achievement level due to individual learning style preferences from subjects in this study. An F value greater than 1 suggests that the Null should be rejected (Larson & Farber, 2012). Hence we reject the H2Null. Assimilator had the highest mean score (82.85) among the four learning styles.

Table 22

One Way ANOVA for RQ 2

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound
Accommodator		30	76.37	7.712	1.408	73.49
Diverger		33	77.03	9.551	1.663	73.64
Assimilator		26	82.85	7.918	1.553	79.65
Converger		30	81.73	9.329	1.703	78.25
Total		119	79.32	9.052	0.830	77.68
Model	Fixed Effects			8.715	0.799	77.74
	Random Effects				1.622	74.16

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Table 23

Descriptive Statistics

		95% Confidence Interval for Mean Upper Bound	Minimum	Maximum	Between-Component Variance
Accommodator		79.25	58	93	
Diverger		80.42	54	93	
Assimilator		86.04	68	96	
Converger		85.22	54	96	
Total		80.96	54	96	
Model	Fixed Effects	80.90			
	Random Effects	84.48			7.915

Table 24

One Way ANOVA (Post-Scores)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	932.678	3	310.893	4.093	0.008
Within Groups	8735.188	115	75.958		
Total	9667.866	118			

Tables 25 and 26 below illustrate a Least Significant Difference (LSD) post-hoc analysis to identify the statistical significant learning styles pairs, yielding: Accommodator/Assimilator p = .006; Accommodator/Diverger p = .019; Diverger/Assimilator p = .012; and Diverger/Converger p = .035.

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Table 25

LSD Post-hoc Analysis (Post-Scores)

(I) Preferred Learning Style	(J) Preferred Learning Style	Mean Difference (I-J)	Std. Error	Sig.
Accommodator	Diverger	-0.664	2.199	0.763
	Assimilator	-6.479*	2.335	0.006
	Converger	-5.367*	2.250	0.019
Diverger	Accommodator	0.664	2.199	0.763
	Assimilator	-5.816*	2.285	0.012
	Converger	-4.703*	2.199	0.035
Assimilator	Accommodator	6.479*	2.335	0.006
	Diverger	5.816*	2.285	0.012
	Converger	1.113	2.335	0.635
Converger	Accommodator	5.367*	2.250	0.019
	Diverger	4.703*	2.199	0.035
	Assimilator	-1.113	2.335	0.635

Table 26

LSD Multiple Comparisons (Post-Scores)

(I) Preferred Learning Style	(J) Preferred Learning Style	95% Confidence Interval	
		Lower Bound	Upper Bound
Accommodator	Diverger	-5.02	3.69
	Assimilator	-11.11	-1.85
	Converger	-9.82	-0.91
Diverger	Accommodator	-3.69	5.02
	Assimilator	-10.34	-1.29
	Converger	-9.06	-0.35
Assimilator	Accommodator	1.85	11.11
	Diverger	1.29	10.34
	Converger	-3.51	5.74
Converger	Accommodator	0.91	9.82
	Diverger	0.35	9.06
	Assimilator	-5.74	3.51

*The mean difference is significant at the 0.05 level.

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Research Question 3. Linear Regression. Tables 27 through 32 illustrates the linear regression that examined demographics and the results on post scores. For H3Null, a linear regression was run to examine demographics on post scores. The test yielded a regression model that was statistically significant with an $F = 4.550$ $p < .001$ (sig), $R^2 = .223$ and an adjusted $R^2 = .174$. However, all of the coefficients failed to achieve statistical significance. It is understandable in the context of the homogeneous nature of the sample; soldiers are more alike than different vis-a-vis the other demographics variables studied here.

Table 27

Linear Regression RQ 3 (Descriptive Statistics)

	Mean	Std. Deviation	N
Post-Score	79.32	9.052	119
Age	32.28	8.183	119
Military Rank	3.71	2.461	119
Military Position	3.38	2.213	119
Deployment	0.80	0.403	119
Computer Knowledge	7.76	0.963	119
Military Education	3.06	1.643	119
Civilian Education	2.77	1.123	119

Table 28

Linear Regression RQ 3 (Correlations)

		Post-Score	Age	Military Rank	Military Position
Pearson Correlation	Post-Score	1.000	-0.007	0.352	0.365
	Age	-0.007	1.000	0.037	0.266
	Military Rank	0.352	0.037	1.000	0.862
	Military Position	0.365	0.266	0.862	1.000
	Deployment	0.046	0.390	-0.154	-0.066
	Computer Knowledge	0.345	-0.47	0.471	0.332
Sig. (1-tailed)	Military Education	0.333	0.020	0.970	0.844
	Civilian Education	0.405	-0.089	0.828	0.737

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Table 28 (continued)

Linear Regression RQ 3 (Correlations)

		Post-Score	Age	Military Rank	Military Position
Pearson Correlation	Post-Score	.	0.472	.000	.000
	Age	0.472	.	0.343	0.002
	Military Rank	.000	0.343	.	.000
	Military Position	.000	0.002	.000	.
	Deployment	0.311	.000	0.047	0.239
	Computer Knowledge	.000	.000	.000	.0000
	Military Education	.000	0.416	.000	.000
	Civilian Education	.000	0.168	.000	.000
Sig. (1-tailed)	Post-Score	119	119	119	119
	Age	119	119	119	119
	Military Rank	119	119	119	119
	Military Position	119	119	119	119
	Deployment	119	119	119	119
	Computer Knowledge	119	119	119	119
	Military Education	119	119	119	119
	Civilian Education	119	119	119	119
N					

Table 28 (continued)

Linear Regression RQ 3 (Correlations)

		Deployment	Computer Knowledge	Military Education
Pearson Correlation	Post-Score	0.046	0.345	0.333
	Age	0.390	-0.470	0.020
	Military Rank	-0.154	0.471	0.970
	Military Position	-0.066	0.332	0.844
	Deployment	1.000	-0.233	-0.20
	Computer Knowledge	-0.233	1.000	0.459
	Military Education	-0.200	0.459	1.000
	Civilian Education	-0.139	0.569	0.852
Sig. (1-tailed)				

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Table 28 (continued)

Linear Regression RQ 3 (Correlations)

		Deployment	Computer Knowledge	Military Education
Pearson Correlation	Post-Score	0.311	.000	.000
	Age	0.000	.000	0.416
	Military Rank	0.047	.000	.000
	Military Position	0.239	.000	.000
	Deployment	.	0.005	0.015
Sig. (1-tailed)	Computer Knowledge	0.005	.	.000
	Military Education	0.015	.000	.
	Civilian Education	0.065	.000	.000
N	Post-Score	119	119	119
	Age	119	119	119
	Military Rank	119	119	119
	Military Position	119	119	119
	Deployment	119	119	119
	Computer Knowledge	119	119	119
	Military Education	119	119	119
	Civilian Education	119	119	119

Table 29

Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.472[a]	0.223	0.174	8.227	0.223	4.550	7

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Table 30

Regression Model Summary

Model	Change Statistics	
	df2	Sig. F Change
1	111	0

a. Predictors: (Constant), Civilian Education, Age, Deployment, Computer Knowledge Military Position, Military Rank.

Table 31

Regression Model Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2155.685	7	307.955	4.550	.000[b]
	Residual	7512.181	111	67.677		
	Total	9667.866	118			

a. Dependent Variable: Post-Score

b. Predictors: (Constant), Civilian Education, Age, Deployment, Computer Knowledge, Military Position, Military Rank, Military Education.

Table 32

Regression Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	54.548	10.613		5.140	.000
	Age	0.023	0.134	0.021	0.174	0.862
	Military Rank	0.559	1.395	0.152	0.400	0.690
	Military Position	0.983	0.784	0.240	1.253	0.213
	Deployment	2.247	2.150	0.100	1.045	0.298
	Computer Knowledge	2.099	1.140	0.223	1.842	0.068
	Military Education	-1.863	2.136	-0.338	-0.872	0.385
	Civilian Education	2.247	1.431	0.279	1.570	0.119

a. Dependent Variable: Post-Score

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Research Question 4. Tables 33-38 below illustrates a multivariate linear regression following a hierarchical method which was run for H4Null. The test yielded a regression model that was statistically significant with an $F = 3.524$ $p < .001$ (sig), $R^2 = .266$ and an adjusted $R^2 = .190$. However, the coefficients did not show any statistically significant contribution to the achievement. This is understandable in the context of the homogeneous nature of the sample; soldiers are more alike than different vis-a-vis the other demographics variables studied here.

Table 33.

RQ 4 Descriptive Statistics

	Mean	Std. Deviation	N
Post-Score	79.32	9.052	119
Civilian Education	2.77	1.123	119
Military Education	3.06	1.643	119
Computer Knowledge	7.76	0.963	119
Deployment	0.80	0.403	119
Military Position	3.38	2.213	119
Military Rank	3.71	2.461	119
Age	32.28	8.183	119
PLS3	0.22	0.415	119
PLS2	0.28	0.450	119
PLS1	0.25	0.436	119
TM2	0.51	0.502	119

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Table 34

RQ 4 Correlations

		Post-Score	Civilian Education	Military Education	Computer Knowledge
Pearson Correlation	Post-Score	1	0.405	0.333	0.345
	Civilian Education	0.405	1	0.852	0.569
	Military Education	0.333	0.852	1	0.459
	Computer Knowledge	0.345	0.569	0.459	1
	Deployment	0.046	-0.139	-0.200	-0.233
	Military Position	0.365	0.737	0.844	0.332
	Military Rank	0.352	0.828	0.970	0.471
	Age	-0.007	-0.089	0.020	-0.470
	PLS3	0.207	0.071	0.080	0.193
	PLS2	-0.157	-0.126	-0.183	-0.063
	PLS1	-0.190	-0.211	-0.246	-0.180
	TM2	-0.103	-0.063	0.086	-0.029
Sig. (1-tailed)	Post-Score	.	.000	.000	.000
	Civilian Education	.000	.	.000	.000
	Military Education	.000	.000	.	.000
	Computer Knowledge	.000	.000	.000	.
	Deployment	0.311	0.065	0.015	0.005
	Military Position	.000	.000	.000	.000
	Military Rank	.000	.000	.000	.000
	Age	0.472	0.168	0.416	.000
	PLS3	0.012	0.222	0.192	0.018
	PLS2	0.044	0.086	0.023	0.247
	PLS1	0.019	0.011	0.004	0.025
	TM2	0.131	0.250	0.175	0.378
N	Post-Score	119	119	119	119
	Civilian Education	119	119	119	119
	Military Education	119	119	119	119
	Computer Knowledge	119	119	119	119
	Deployment	119	119	119	119
	Military Position	119	119	119	119
	Military Rank	119	119	119	119
	Age	119	119	119	119
	PLS3	119	119	119	119

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Table 34 (continued)

RQ 4 Correlations

	PLS2	119	119	119	119
N	PLS1	119	119	119	119
	TM2	119	119	119	119

		Deployment	Military Position	Military Rank	Age	PLS3
	Post-Score	0.046	0.365	0.352	-0.007	0.207
	Civilian Education	-0.139	0.737	0.828	-0.089	0.071
	Military Education	-0.200	0.844	0.970	0.020	0.080
	Computer Knowledge	-0.233	0.332	0.471	-0.470	0.193
	Deployment	1	-0.066	-0.154	0.390	-0.190
	Military Position	-0.066	1	0.862	0.266	0.048
	Military Rank	-0.154	0.862	1	0.037	0.063
	Age	0.390	0.266	0.037	1	-0.125
	PLS3	-0.190	0.048	0.063	-0.125	1
	PLS2	-0.063	-0.217	-0.163	-0.178	-0.328
Pearson Correlation	PLS1	0.147	-0.249	-0.254	0.023	-0.307
	TM2	-0.029	0.045	0.096	0.017	-0.013
	Post-Score	0.311	.000	.000	0.472	0.012
Sig. (1-tailed)	Civilian Education	0.065	.000	.000	0.168	0.222
	Military Education	0.015	.000	.000	0.416	0.192
	Computer Knowledge	0.005	.000	.000	.000	0.018
	Deployment	.	0.239	0.047	.000	0.019
	Military Position	0.239	.	.000	0.002	0.303
	Military Rank	0.047	.000	.	0.343	0.246
	Age	.000	0.002	0.343	.	0.087
	PLS3	0.019	0.303	0.246	0.087	.
	PLS2	0.248	0.009	0.038	0.027	.000
	PLS1	0.055	0.003	0.003	0.402	.000
	TM2	0.376	0.313	0.150	0.429	0.443

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Table 34 (continued)

RQ 4 Correlations

		Deployment	Military Position	Military Rank	Age	PLS3
N	Post-Score	119	119	119	119	119
	Civilian Education	119	119	119	119	119
	Military Education	119	119	119	119	119
	Computer Knowledge	119	119	119	119	119
	Deployment	119	119	119	119	119
	Military Position	119	119	119	119	119
	Military Rank	119	119	119	119	119
	Age	119	119	119	119	119
	PLS3	119	119	119	119	119
	PLS2	119	119	119	119	119
	PLS1	119	119	119	119	119
	TM2	119	119	119	119	119

		PLS2	PLS1	TM2
Pearson Correlation	Post-Score	-0.157	-0.190	-0.103
	Civilian Education	-0.126	-0.211	-0.063
	Military Education	-0.183	-0.246	0.086
	Computer Knowledge	-0.063	-0.180	-0.029
	Deployment	-0.063	0.147	-0.029
	Military Position	-0.217	-0.249	0.045
	Military Rank	-0.163	-0.254	0.096
	Age	-0.178	0.023	0.017
	PLS3	-0.328	-0.307	-0.013
	PLS2	1	-0.360	0.153
	PLS1	-0.360	1	-0.092
	TM2	0.153	-0.092	1
Sig. (1-tailed)				

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Table 34 (Continued)

RQ 4 Correlations

		PLS2	PLS1	TM2
Pearson Correlation	Post-Score	0.044	0.019	0.131
	Civilian Education	0.086	0.011	0.250
	Military Education	0.023	0.004	0.175
	Computer Knowledge	0.247	0.025	0.378
	Deployment	0.248	0.055	0.376
	Military Position	0.009	0.003	0.313
	Military Rank	0.038	0.003	0.150
	Age	0.027	0.402	0.429
	PLS3	0	0	0.443
	PLS2	.	0	0.048
	PLS1	0	.	0.160
	TM2	0.048	0.160	.
Sig. (1-tailed)	Post-Score	119	119	119
	Civilian Education	119	119	119
	Military Education	119	119	119
	Computer Knowledge	119	119	119
	Deployment	119	119	119
	Military Position	119	119	119
	Military Rank	119	119	119
	Age	119	119	119
	PLS3	119	119	119
	PLS2	119	119	119
	PLS1	119	119	119
	TM2	119	119	119
N				

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Table 35

RQ 4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.472[a]	0.223	0.174	8.227	0.223	4.550	7
2	.511[b]	0.262	0.193	8.130	0.039	1.881	3
3	.516[c]	0.266	0.190	8.144	0.004	0.641	1

Table 36

RQ 4 Model Summary

Model	Change Statistics	
	df2	Sig. F Change
1	111	0
2	108	0.137
3	107	0.425

a. Predictors: (Constant), Age, Military Education, Deployment, Computer Knowledge, Civilian Education, Military Position, Military Rank
b. Predictors: (Constant), Age, Military Education, Deployment, Computer Knowledge, Civilian Education, Military Position, Military Rank, PL3, PLS1, PLS2
c. Predictors: (Constant), Age, Military Education, Deployment, Computer Knowledge, Civilian Education, Military Position, Military Rank, PL3, PLS1, PLS2, TM2

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Table 37

RQ 4 Multivariate Linear Regression Model Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2155.69	7	307.955	4.550	.000[b]
	Residual	7512.18	111	67.677		
	Total	9667.87	118			
2	Regression	2528.62	10	252.862	3.825	.000[c]
	Residual	7139.25	108	66.104		
	Total	9667.87	118			
3	Regression	2571.10	11	233.737	3.524	.000[d]
	Residual	7096.76	107	66.325		
	Total	9667.87	118			

a. Dependent Variable: Post-Score
b. Predictors: (Constant), Age, Military Education, Deployment, Computer Knowledge, Civilian Education, Military Position, Military Rank
c. Predictors: (Constant), Age, Military Education, Deployment, Computer Knowledge, Civilian Education, Military Position, Military Rank, PL3, PLS1, PLS2
d. Predictors: (Constant), Age, Military Education, Deployment, Computer Knowledge, Civilian Education, Military Position, Military Rank, PL3, PLS1, PLS2, TM2

Table 38

RQ 4 Regression (*Coefficients)*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	54.548	10.61		5.140	.000
	Civilian Education	2.247	1.431	0.279	01.57	0.119
	Military Education	-1.860	2.136	-0.338	-0.872	0.385
	Computer Knowledge	2.099	1.140	0.223	1.842	0.068
	Deployment	2.247	2.150	0.100	1.045	0.298
	Military Position	0.983	0.784	0.240	1.253	0.213
	Military Rank	0.559	1.395	0.152	0.400	0.690
	Age	.0230	0.134	0.021	0.174	0.862

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Table 38 (Continued)

RQ 4 Regression (Coefficients)

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	59.393	11.08		5.359	.000
	Civilian Education	2.523	1.421	0.313	1.775	0.079
	Military Education	-2.330	2.134	-0.423	-1.092	0.277
	Computer Knowledge	1.617	1.146	0.172	1.412	0.161
	Deployment	2.790	2.156	0.124	1.294	0.198
	Military Position	0.813	0.785	0.199	1.036	0.302
	Military Rank	0.808	1.389	0.220	0.581	0.562
	Age	0.002	0.135	0.001	0.012	0.990
	PLS3	2.650	2.323	0.121	1.141	0.257
	PLS2	-1.934	2.320	-0.096	-0.834	0.406
	PLS1	-2.226	2.337	-0.107	-0.953	0.343
3	(Constant)	59.904	11.119		5.387	.000
	Civilian Education	2.220	1.473	0.275	1.507	0.135

Table 38 (Continued)

RQ 4 Regression (Coefficients)

	Military Education	-2.156	2.149	-0.391	-1.003	0.318
	Computer Knowledge	1.631	1.148	0.174	1.422	0.158
	Deployment	2.842	2.160	0.127	1.315	0.191
	Military Position	0.799	0.786	0.195	1.017	0.312
	Military Rank	0.855	1.393	0.233	0.614	0.540
	Age	0.003	0.135	0.002	0.020	0.984
	PLS3	2.762	2.331	0.127	1.185	0.239
	PLS2	-1.602	2.360	-0.080	-0.679	0.499
	PLS1	-2.160	2.342	-0.104	-0.922	0.359
	TM2	-1.272	1.589	-0.071	-0.800	0.425

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Table 39 summarizes all the statistical analyses conducted that on Research Questions 1-4.

Table 39

Summary of the Study

Research Question	Hypothesis	IV	DV	Statistical Test + Effects Size
RQ1: What is the best method to instruct the Army Leadership Manual (ADRP 6-22) to subjects during a time-constrained Unit Professional Development Program in the Army National Guard?	H1	Teaching Method (TM)	Post Score (PS)	**T-Test** t=.1.125 sig.=.263 **Not Reject the Null**
RQ2: Is a subject's individual learning style related to achievement during the Unit Professional Development Program in the Army National Guard?	H2	Learning Style (LS)	Post Score (PS)	**ANOVA** F=.4.093 sig.=.008 **Reject the Null**
RQ3: To what degree do demographics of the subjects have an effect on achievement during the Unit Professional Development Program in the Army National Guard?	H3	Demographics Age (Age) Rank (Rank) Position (Pos) Deployment (Exp) Computer Knowledge (Tech) Military Education (MilEd) Civilian Education (CivEd)	Post Score (PS)	**Regression** F= 4.550 Sig.000 R^2. = .233 Adj. R^2. = .174 **Reject the Null**

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Table 39 (Continued)

Summary of the Study

Research Question	Hypothesis	IV	DV	Statistical Test + Effects Size
RQ4: To what degree do teaching methods, learning styles and demographics of the subjects have on achievement during the Unit Professional Development Program in the Army National Guard?	H4	Teaching Methods (TM) Learning Styles (LS) Demographics	(PS)	**Multivariate Linear Regression** F=3.524 sig.=.000 R^2 = .266 Adj. R^2. = .190 **Reject the Null**

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CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Discussion and Implications of the Research

The 119 subjects in this experimental design were selected from the 2nd Battalion 113th Infantry Regiment, New Jersey Army National Guard through their participation in a required annual professional development event. This professional development program was conducted using two teaching methods (i.e., Traditional Instruction and Computer Assisted Instruction) during repeated five hour sessions over several months, and conducted at the Joint Training and Training Development Center (JT2DC) at Fort Dix, New Jersey. The Department of the Army (DA) published a new Leadership Manual (Field Manual 6-22) in October 2006 and an update in September 2012 Army Doctrine Release Publication 6-22 which was the training manual and materials used during the unit professional development program. Specifically, this study compared two different teaching methods within an Army National Guard Professional Development Program and the interaction of learning styles and the influence on achievement level. Particular emphasis was placed on Field Manual 6-22 which focused extensively on "Developmental Counseling."

The specific training material used was a developmental counseling package produced by the Center for Army Leadership (CAL). Inasmuch as the counseling process is extremely important, the Army Techniques Publication (ATP) 6-22.1 outlines that counseling is required by all Army leaders and should occurs at various times throughout the training year (ATP 6.22.1, 2014). In 2014, the Commanding General for Forces Command, General Daniel Allyn articulated the importance of counseling in his guidance to Army Leadership.

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> He stated, "Counseling is the key to developing our junior leaders. Battalion and Brigade Teams must develop leaders who possess the attributes and competencies identified in the 'Leader Requirements Model' of ADP 6-22 and can build effective teams to meet future challenges. We must walk the walk here. Over the past dozen years of war, our collective counseling skills atrophied as noted in the recent Center for Army Leadership Annual Survey of Army Leadership (CASAL) report." (Allyn, 2014)

Thus, the Army's leadership at all levels has mandated that all military leaders understand and apply this new manual to unit personnel. But time is a precious commodity in the Army National Guard. There are many training requirements that must be balanced and, at times, can be overwhelming for soldiers. Maximizing this limited time to conduct unit professional development is the obligation of the Commander, albeit a very challenging one.

In February 2015 the Strategic Studies Institute (SSI) and United States Army War College Press published a study titled, *Lying to Ourselves: Dishonesty in the Army Profession* by Dr. Wong and Dr. Gerras. The following quote highlights the relationship between their research and the problem statement mentioned as explicated in the introduction of this study (see chapter One).

> "The suffocating amount of mandatory requirements imposed upon units has been well documented—units and individuals are literally unable to complete the demands placed upon them. Given that it is impossible to comply with every requirement, how do units and individuals reconcile the impossible task of accomplishing all requirements with a bureaucracy that demands confirmation that every directive was accomplished?" (Wong & Gerras, 2015)

This current study also explored the subjects' preferred learning styles and possible impact on achievement level. The subjects were leaders in the 2nd Battalion 113th Infantry Regiment that ranged from E-5 (Sergeant) through 0-4 (Major). This was the intended target audience for receiving the Army Leadership principles and counseling techniques because it is at their level of interaction with all soldiers that mentoring, counseling, and teaching gain the most positive results.

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The theoretical orientation and conceptual framework of this study described Kolb's learning theory, and various leadership theories. The model used in this study was the traditional Solomon four-group experimental design as described by Nachmias and Nachmias (1979). This study was concerned with two instructional methods (i.e., treatments), Traditional Instruction (TI), Computer Assisted Instruction (CAI), and their effect on achievement level. The importance of this study lies in its ability to provide unit leadership a deeper understanding on how to employ more effective method(s) of instruction when conducting to conduct professional development programs assigned to educate our future leaders in a time compressed environment.

The multiple analyses in this study of the hypotheses showed varying results. It was demonstrated that there was no statistically significant difference between the two teaching methods (F=.1.250, sig, .263) which required the HNull1 for Research Question 1 to not be rejected. H1Null effect size was small (.21) with very low power (.31). For Research Question 2 it was demonstrated that there was a statistically significant difference with achievement levels due to learning style preferences (F=4.093, sig, .008) which required the HNull2 for Research Question 2 to be rejected. H2Null effect size was small (.096) with very low power (.12). For Research Question 3, the H3Null was rejected based on F=4.550, sig, .=.000, R^2 = .233, and an adjusted R^2 = .174. The H3Null effect was small (.15) with a high power of .87, due to the fact that no individual coefficient achieved statistical significance. In addition, the H4Null was rejected based on F=3.524, sig. =.000, R^2 = .266, and an adjusted R^2 = .190. H4Null effect size was small (.27); the power was, however, very strong (.99). This said, the individual coefficients did not show any statistically significant contribution to achievement levels.

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Teaching Methods

Table 40 illustrates the small statistical difference between the two methods of instruction employed in this study. The Traditional Method of Instruction had a post-score mean of 80.28 while the Computer Assisted Instruction method had a 78.41, a minimal improvement of less than two points on a scale of 100. The implications of this finding were meaningful with regards to training since more and more Army training requirements are computer based. Commanders can therefore feel a degree of confidence that soldiers using computer based training are receiving effective instruction.

Table 40

Summary of Teaching Methods and Scores (Outcomes)

Training Method		Pre-Score	Post-Score
Traditional Instruction	Mean	70.64	80.28
	N	22	58
	Std. Deviation	10.201	8.908
Computer Assisted Instruction	Mean	66.84	78.41
	N	25	61
	Std. Deviation	9.136	9.166
Total	Mean	68.62	79.32
	N	47	119
	Std. Deviation	9.732	9.052

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Learning Styles

Learning style was the independent variable for Research Question 2. The current study indicates that there was a statistically significant impact on achievement levels based on learning style preferences of the subjects. This is an area that should be explored further in future research to gather more details on why it was significant. Because subjects were not grouped according to their learning style as this would have been incongruent with the requirement for the random assignment of subjects. However, study results tells us that, at a minimum, leaders should understand that learning style preferences of subjects should be kept in mind when developing any unit professional development program or unit training in general. "Understanding how a student prefers to learn can help the teacher lead the student in developing existing and adapting new individual learning strategies" (Smith, 1990). In other words, a student-centered approach to the teaching-learning process should replace the outmoded concept of the teacher as the 'sage on the stage.'

Education Level

Education level was one of seven demographic variables in this study. As extrapolated from the subject's record form, most of the subjects in this study have used either all or some of the educational benefits offered by the state and federal governments through the GI Bill and/or State Tuition Free programs. These programs are available to National Guard members and most of the subjects having earned college credits and/or degrees using the educational benefits they earned. Leaders at all levels, whether in the National Guard or other military components, always reinforce to all service members the need to continue their civilian education and to use the benefits they have rightfully earned.

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Age

The variance in the subjects' age in this study ranged from 20 through 54 years old. This demographic was important in order to determine whether there was a difference in the achievement level (i.e., scores) due to age. This demographic variable showed no significance in achievement level but does, however, highlight two other points. First, the fact that a subject was older did not necessarily predict higher examination scores just because they have more time in service and experience. And second, younger subjects did not necessarily score higher using computer based training even though they are usually more 'tech' savvy. This is a fertile area for possible future research.

Deployment

This study was conducted within a year following a large deployment of service members from the New Jersey Army National Guard. Prior to deployment, additional training was required in the area of cultural awareness, or other requirements, many of which were computer based. Accordingly, it is not surprising that nearly 80% of the subjects had deployment experience and were considered veterans.

Computer Knowledge

Within the last few years, the Army has required additional training using Structured Self-Development (SSD) which was added as a prerequisite to attend resident military education courses. SSD is computer-based on line training. Coupled with deployment training, subjects' experience using computer based training it was not at all surprising that subjects had a substantial amount of experience on computers ranging from intermediate to advanced expertise.

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LIMITATIONS ON GENERALIZABILITY

This study was conducted with a sample of 119 officers and non-commissioned officers of the New Jersey Army National Guard, one of the 54 states and territories that have National Guard organizations. The study utilized leaders of the 2nd Battalion 113th Infantry Regiment (NJARNG); not all solders of the rank of E-5 (Sergeant) and above were available to participate in the study due to numerous other requirements that also must get accomplished (e.g., field training, periodic health assessments, military schooling, and civilian employment conflict, etc.). Therefore, the small number in the sample, while not negating the results described in this chapter may have an impact on the extent to which this study's results can be generalized.

Secondly, given that the subjects are required to participate in a mandatory unit professional development program conducted annually, it was totally voluntary on the part of the subjects to use the collected data. 119 out of 125 subjects completed all requirements, including consent forms, which equates to 95% completion rate. Any effort to generalize this study group to the overall population of military leaders must keep this in context.

Lastly, the generalizability of this study may be constrained by the fact that it only considered two training methods whereas there are many others that might have been included (e.g., small group instruction, etc.). However, the two chosen for this study, traditional instruction (i.e., face to face) and computer based training, are most those frequently used in the New Jersey Army National Guard.

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OTHER LIMITATIONS

The limitations in this study were primarily due to the nature of the research within an organization operating in a time-constrained learning environment. Limitations include the training distracters that can and did, delay the study. Professional development programs historically are delayed or cancelled due to other training requirements that take priority. This is exactly what occurred in this case. Originally, more of the unit leadership would have received this important instructional material but that was not the case due to competing requirements. The time frame from data collection to analysis did span several years, however the data still provided meaningful information to analyze and interpret.

DELIMITATIONS

A potential participant bias was addressed through the randomness of the placement of students. Instructors' biases were addressed and eliminated because the instruction was the same with both methods of teaching. The instructor taught/proctored the content and the subjects did their own work. There were no benefits to the instructor or the subjects if their actions/scores are positive or negative. Gender and ethnicity were not used in this study due to the researcher's perspective, that "a soldier is a soldier" regardless of race and gender. It is also important to note that the material and teaching methods used in this study were gender-neutral, hence the absence of gender in the demographics. Confidentiality and privacy was adhered to because the researcher used coding to identify each participant and their associated exam(s) scores. Rank, age and other demographics was used in the study. While the unit commanders were not provided the scores of the subjects, participants were able to get a copy of their exams scores if they requested them. They knew that the scores were not be sent to their commanders unless the subjects' requested them to be sent.

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SIGNIFICANCE

The study results can provide the unit leadership with a deeper understanding on how to implement the most effective method to conduct professional development programs to our future leaders in a time-constrained environment. There are many teaching methods and individual learning styles and this study can provide whether a difference will occur in a military organization. The focus of this research was to assist commanders in understanding this fact and placing emphasis on future leader development program designs. Since time is a precious commodity in the Army National Guard and the fact that there are many training requirements, this study may help leaders maximize the efficacy of this limited time. With computer based instruction on the rise in the National Guard, this study could also provide senior leaders with confidence this particular training is valuable and viable.

IMPLICATIONS FOR UNIT SENIOR LEADERS

As technology continues to improve unit leaders need to capitalize on it. There is an enormous number of training requirements conducted annually for which computer based training is a viable training modality, in that it improves both efficiency and effectiveness. In a 2012 study conducted by the Center for Army Leadership as part of their Annual Survey of Army Leadership (CASAL), recommendations to increase "instruction on the development of leadership as a skill and increasing emphasis on leaders developing subordinates." (Riley, Hatfield, Paddock, and Fallesen, 2013) Again, time is a precious commodity in the National Guard. The training products that the Center for Army Leadership (CAL) provides can be incorporated in unit training programs (e.g., professional development programs, etc.), the 'developmental counseling' training material used in this study was developed by CAL. This leadership skill is so important that a new publication (Army Techniques Publication (ATP)

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6.22.1) was produced in July 2014. In the last decade or so, the operational tempo (i.e., pace of operational support) has been so high, that leadership counseling skills have atrophied (Allyn, 2014). The need to get back to 'developmental counseling' is that important. Future unit development programs must include it, and leaders must understand its importance and add it to future training programs. The challenge for leaders therefore, is to, find time to conduct this training.

RECOMMENDATIONS

The fact that the population in this study showed nearly no difference in outcomes due to the two training methods is encouraging for senior leaders. Some leaders and soldiers in the military today still have some bias which is not complimentary toward computer based learning, in general, and distance learning, in particular. One study showed that officers were not convinced computer based training and distance learning was beneficial and just added to a soldier's overall requirements (Army Training Leader Development Panel, 2003).

This study provides senior leaders with reassurances that computer based training has a positive impact as traditional instructor-led methods. Due to the numerous requirements, today's Army has moved moves many requirements toward computer based training due to resource constraints and limited time. Requirements that service members have to conduct on their personal time are often overwhelming. With reference to this study, the results indicate that teaching "developmental counseling" could have been done at alternate locations, at the service members' own pace, and, possibly, as personal self-development. This allows Commanders and other Senior Leaders to concentrate on more demanding/pressing requirements.

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Commanders and Senior Leaders at all levels have been advocating that service members should use their well-deserved and earned educational benefits to seek civilian educational opportunities. They need to continue advocating this position.

Learning Styles Preferences

As it has been emphasized that time is precious in the National Guard with the many training requirements, it is recommended that Commanders and Senior Leaders take time to understand the learning style preferences of their service members. According to DiBartola (2006), "Kolb's Learning Style Inventory (LSI) is a well-used tool that educators have used to increase their understanding of the learning process and to incorporate effective strategies to adapt learning methodologies to meet the needs of all students." (DiBartola, 2006) It is also recommended that leadership review Kolb's LSI so that they not only understand that soldiers have preferred learning modalities, but also so they can instruct the soldiers in ways to improve individual achievement level. While one does not always get the opportunity to choose the delivery method of instructional material, there are ways to compensate for this, a fact well documented by Kolb's LSI. This is important for leaders to understand as they plan future training events as it is very likely to save time and other resources, again, improving both efficiency and effectiveness.

FUTURE RESEARCH

As technology evolves, it is important to continue exploring ways to incorporate technology into the overall training strategy for leaders at all levels. As mentioned previously, understanding the learning preference style of individuals is critical to determine the degree to which technology will meet their needs in the future. Future research needs to include soldier and leader views on computer based training, distance learning, and learning style

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preferences. As training times continued to be compressed due to the enormous number of training requirements, gathering this information will assist in the development of a more balanced approach to training. However, learning style preferences and teaching methods could benefit from further exploration. At a minimum, leaders should understand that learning preference of subjects should be kept in mind when developing any professional development or training.

Size of sample. The sample size in this study included 119 subjects. The data collected were useful and conformed to normal distributions while making an adjustment for a small sample population allowed for appropriate analyses. Competing training requirements did not allow the time necessary to garner a larger population. Optimally a larger study population size would have been beneficial and in future studies should be sought. With relatively new senior level directives that outline that 'developmental counseling' needs emphasis at all levels, this may provide the impetus for future researchers access not only to larger samples, but incentives to continue looking at better ways to educate our members in a time and resource constrained environment.

Other demographics. This study considered eight demographic characteristics: preferred learning styles, age, military rank, military position, deployment experience, computer knowledge, military education, and civilian education which were sufficient to answer the research questions. Future research might explore additional demographic factors such as gender, race, and ethnicity among many other possibilities.

Meta-analysis. Future studies that replicate the work of this study should also consider a review of the research literature on meta-analysis. Paul Ellis (2012) in his publication, *The Essential Guide to Effect Sizes Statistical Power, Meta-Analysis, and the*

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Interpretation of Research Results provides excellent guidance on future research and future researchers are encouraged this review this publication prior to exploring replication studies. Ellis (2012) provides a plethora of guidance on types of meta-analyses its use as a tool for theory development, replication research and much more. Future researcher using the meta-analysis method for their study should keep in mind, "that a meta-analytic approach is not only conceptually sound, feasibly practical, but also the 'appropriate' method for synthesizing multiple studies." (Shachar, 2002)

Training requirements and Critical Thinking. Finally, while the issue of multiple training requirements and time constraints may not be considered a "complex problem" to some, it may, in fact, be time to apply critical thinking skills to balance the extraordinary number of requirements in the Army National Guard. Leaders should have a creative and critical thinking attitude. As stated by Dr. Gerras' article titled, *Thinking Critically About Critical Thinking: A Fundamental Guide for Strategic Leaders:*

> "A well-cultivated critical thinker raises vital questions and problems, gathers and assesses relevant information, and can effectively interpret it; comes to well-reasoned conclusions and solutions, testing them against relevant criteria and standards; thinks open-mindedly within alternative systems of thought, recognizing and assessing, as need be, their assumptions, implications, and practical consequences; and communicates effectively with others in figuring out solutions to complex problems." (Paul and Elder, 2001)

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APPENDIX A

PARTICIPANT'S RECORD FORM

Last Name _____First Name _____ MI _____

Last Four (SSN) _____

Unit _____

Position (Circle One) TL / SL / PSG / PL / Co XO / 1SG / Co CDR / Staff

Rank (Circle One) E-5 / E-6 / E-7 / E-8 / E-9 / 01 / 02 / 03 / 04 / 05

Age _____

Highest Military Education (Circle One) WLC / ALC / SLC / OBC / AOC / CCC / ILE

Highest Civilian Education (Circle One) HS / AA / BS / BA / MA / MS / PhD

Deployment (s) OIF / OEF / None

Computer Knowledge (Circle One)

Beginner (no experience) Novice (minimal experience)
Intermediate (some experience) Advance (experienced)
Expert (knowledgeable in all computer applications)

Informed consent:

The purpose of this study is to compare different teaching methods and the results on achievement level during an Army National Guard Unit Professional Development Program. Your participation in this research is extremely important. It is your choice whether to participate or not. You are asked to take part in this research because your experience as a unit leader can contribute to an understanding of unit professional development programs and the results on achievement level. By signing below you content to your participation. ***Your names will not be used in the study.***

Signature of Participant _____

Do not write below this line (Researcher Only)

Group 1 Group 2 Group 3 Group 4

1 = Accommodator 2 = Diverger 3 = Assimilator 4 = Converge

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APPENDIX B

PRE-TEST

_____ _____ _____ _____
Name (Last Name, First Name) Rank Unit Last 4

1. The new Army Leadership Field Manual is which of the following:
    a. FM 22-100
    b. FM 7-0
    c. FM 6-22
    d. TC 6-22
    e. None of the above

2. Direct Level Leadership interacts as the lowest levels in the Army. (T/F)

3. Which of the following is the Developmental Counseling Form:
    a. DA 67-9-1
    b. DA 67-9-1a
    c. DA 4856
    d. DA 2166-8-1
    e. None of the above

4. The Army Leadership Requirements Model contains the following:
    a. Attributes
    b. Competencies
    c. Be, Know, Do
    d. All of the above
    e. None of the above

5. List the Seven Army Values:
_____,_____

_____,_____,_____

_____,_____

6. Counseling is not just an occasional or quarterly task. Counseling is about taking care of your subordinates on a regular basis. (T/F)

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7. Based on your experience and your understanding of developmental counseling, select the following item(s) that is/are a component of developmental counseling:
   a. Two-Way Communication
   b. Subordinate-Centered
   c. Goal Setting
   d. Action-oriented
   e. All of the above
   f. None of the above

8. More than providing feedback or direction, counseling is a type of communication that leaders use to that leaders use to produce a plan outlining action that subordinates must take to achieve goals. (T/F)

9. As a leader, you must ensure that developmental counseling is:
   a. One-way
   b. A shared effort
   c. Superior driven
   d. None of the above
   e. All of the above

10. Effective counseling hinges on your ability to:
   a. Direct
   b. Communicate clearly
   c. Free your calendar
   d. All of the above
   e. None of the above

11. Why should leaders perform developmental counseling on a regular basis?
   a. To let soldiers know about all of their deficiencies
   b. To let soldiers know you are always watching them
   c. To help develop soldiers to become future leaders
   d. All of the above
   e. None of the above

12. Developmental counseling is an essential part of growing leaders in the Army. Being able to counsel effectively is a skill that must be practiced for maximum efficacy. (T/F)

13. When counseling a subordinate in recognition of superior performance, you should:
   a. Be specific about the performance worthy of recognition
   b. Be sincere in offering praise
   c. Document the specific information on the counseling form
   d. All of the above
   e. None of the above

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14. Which is not an example of event-oriented counseling?
    a. Promotion
    b. Superior performance
    c. Crisis
    d. Career development
    e. All of the above
    f. None of the above

15. What should you do if a soldier's performance is unsatisfactory because of a lack of knowledge or ability?
    a. Wait until the quarterly review to address the subject
    b. Conduct adverse separation counseling
    c. Put a note in the Soldier's record that mentions the deficiency, do not discuss
    d. Develop a plan for improvement that includes corrective training
    e. None of the above

16. For all soldiers, the counseling cycle begins in the first 90 days and documented on the support form. (T/F)

17. Professional growth counseling is focused on the soldier's:
    a. Past performance
    b. Future performance
    c. Past and future performance
    d. All of the above
    e. None of the above

18. What type of counseling is conducted to assist subordinates in achieving organization and individual goals:
    a. Event-oriented
    b. Performance
    c. Professional growth
    d. All of the above
    e. None of the above

19. Which is an attribute?
    a. Loyalty
    b. Enforce standards
    c. Provide purpose and direction
    d. All of the above
    e. None of the above

20. Which is a competence?
    a. Mental agility
    b. Warrior ethos
    c. Communicates
    d, Warrior ethos
    e. All of the above

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APPENDIX C

POST TEST

_____	_____	_____	_____
Name (Last Name, First Name)	Rank	Unit	Last 4

1. Which of the following are major categories of developmental counseling?
    a. Event-oriented counseling
    b. Performance counseling
    c. Professional growth counseling
    d. b and c
    e. All of the above
    f. None of the above

2. Leadership is influencing people b providing purpose, motivation, and direction while operating to accomplish the mission and improve the organization. (T/F)

3. Counseling is the process used by leaders to review with a subordinate the subordinate's demonstrated performance and potential. (T/F)

4. Counseling is one of the most important leadership development responsibilities for Army leaders. (T/F)

5. All of the following are examples of event-oriented counseling except:
    a. Instances of superior or substandard performance
    b. Reception and integration counseling
    c. Crisis and referral counseling
    d. Promotion and adverse separation counselling
    e. None of the above

6. When counseling a subordinate for a specific performance, the following actions are taken:
    a. Explain the purpose of the counseling
    b. Address the specific unacceptable behavior
    c. Actively listen to the subordinate's response
    d. Remain neutral
    e. b and c
    f. All of the above
    g. None of the above

7. Caring and empathetic Army leaders should counsel all new team members when they join the organization. (T/F)

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8. FM 6-22 defines developmental counseling as:
    a. Superior-centered action oriented
    b. Subordinate-centered communication that produces a plan outlining action
    c. One-way communication from the superior to the subordinate
    d. An adverse action
    e. All of the above
    f. None of the above

9. Reception and integration counseling include the following point except:
    a. Chain of command familiarization
    b. Organizational standards
    c. Security and safety issues
    d. Non-Commissioned Officer (NCO) support channel
    e. Organizational history, structure, and mission
    f. None of the above
    g. All of the above

10. Crisis counseling includes getting a soldier through a period of shock after receiving negative news, such as the notification of the death of a loved one. (T/F)

11. Crisis counseling focuses on the subordinate's long-term needs. (T/F)

12. Leaders may assist the subordinate by lecturing the soldier in need. (T/F)

13. Assisting can also mean referring the subordinate to a support activity or coordinating for external agency support, such as obtaining emergency funding for a flight ticket or putting them in contact with a chaplain. (T/F)

14. Referral counseling helps subordinates:
    a. Work through a personal situation
    b. Prevent a problem from becoming unmanageable
    c. Find appropriate resources, such as Army Community Services (ACS), a chaplain, or an alcohol and drug counselor
    d. All of the above
    e. None of the above

15. Effective Army leaders make use of a four-stage counseling process; identify the correct four stages in order:
    a. Prepare for counseling, identify the need for counseling, follow up, conduct counseling
    b. Identify the need for counseling, prepare for counseling, conduct counseling, follow up
    c. Identify the need for counseling, conduct counseling, document counseling, follow up
    d. None of the above

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16. Army leaders must conduct promotion counseling for all specialists and sergeants who are eligible for advancement without waivers but not recommended for promotion to the next higher grade. (T/F)

17. Adverse separation counseling may involve informing the soldier of the administrative actions available to the commander in the event substandard performance continues and of the consequences associated with those administrative actions. (T/F)

18. Face-to-face performance counseling between the rater and the rated NCO is optional under the non-commissioned officer evaluation reporting system. (T/F)

19. To be effective, developmental counseling must be a shared effort. Leaders assist their subordinates in identifying strengths and weaknesses and creating plans of action. (T/F)

20. While it is not easy to address every possible counseling situation, leaders' self-awareness and an adaptable counseling style focusing on key characteristics will enhance personal effectiveness as a commander. These key characteristics include:

a. Focus, Determination, Listening, Mentoring, Recommending
b. Purpose, Flexibility, Respect, Communication, Support
c. Support, Listening, Determination, Communication, Drive
d. None of the above

21. Army leaders must demonstrate certain qualities to be effective commanders. These qualities include:

a. Empathy, cultural and self-awareness, good listener, good lecturer
b. Respect for subordinates, self and cultural awareness, empathy, and credibility
c. Knowledge, approachability, flexibility, credible, sympathetic
d. None of the above

22. One challenging aspect of counseling is selecting the proper approach to a specific situation. (T/F)

23. Active listening helps communicate reception of the subordinate's message verbally and nonverbally. (T/F)

24. All of the following are key elements of active listening except:

a. Eye contact and body posture
b. Head nods and facial expressions
c. Verbal expressions
d. Lecturing
e. None of the above

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25. What roles do leaders play?
    a. Team leader
    b. Warrior
    c. Ambassador
    d. Humanitarian
    e. Training and Mentor
    f. None of the above
    g. All of the above

26. There are three levels of leadership. Which of the following is not a level of leadership?
    a. Strategic
    b. Tactical
    c. Operational
    d. Organizational
    e. Direct
    f. b and c
    g. None of the above

27. A leader of character includes all of the following except:
    a. Army Values
    b. Mental agility
    c. Warrior ethos
    d. Empathy
    e. None of the above

28. A leader with presence includes the following except:
    a. Composed, confident
    b. Innovative
    c. Military bearing
    d. Physically fit
    e. Resilient
    f. None of the above

29. A leader with intellectual capacity includes the following except:
    a. Mental agility
    b. Composed, confident
    c. Interpersonal tact
    d. Sound judgement
    e. Domain knowledge
    f. None of the above

30. The leadership requirement model includes attributes and core leader competencies. It also defines the BE, KNOW, DO concept. Of the following, what fall in the DO category?
    a. A leader of character
    b. A leader of presence
    c. Leads, Develops, Achieves
    e. A leader of intellectual capacity
    f. None of the above

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31. The Army values are enduring as the foundation for Army Leadership. Select the seven Army values.

a. Leadership, Duty, Respect, Selfless Service, Honor, Integrity, Personal Courage
b. Loyalty, Duty, Response, Selfless Service, Honor, Integrity, Personal Courage
c. Loyalty, Duty, Respect, Selfless Service, Honor, Integrity, Personal Courage
d. Loyalty, Duty, Respect, Selfish Service, Honor, Integrity, Personal Courage
e. None of the above

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APPENDIX D

LSI APPROVAL

Hi Mark,

Congratulations! Your request regarding use of the Learning Style Inventory (LSI) has been approved. Attached you will find the following documents:

· MCB200C: This is a copy of the LSI 3.1 test. You may print a copy of this as needed for your research

· MCB200D: The profile sheet contains the answer key for the test as well as the profiling graphs for plotting scores. This document may produce as necessary for your research. The AC-CE score on the Learning Style Type Grid is obtained by subtracting the CE score from the AC score. Similarly, the AE-RO score = AE minus RO.

These files are for data collection only. This permission does not extend to include a copy of these files in your research paper. It should be sufficient to source it.

We also have the LSI 3.1 and LSI 4.o available online for a minimal fee - the LSI 3.1 is $3 per participant and the LSI 4.0 is $5 per participant. As with the paper-based version participants will not have access to their results. If you are interested in the online version for your research please let me know and I can get you more information on both.

We wish you luck with your project and look forward to hearing about your results. Please email a copy of your completed research paper to Polly_flinch@haygroup.com or mail it to the following address:

LSI Research Contracts
c/o Polly Flinch
Hay Group
116 Huntington Ave, 4th Floor
Boston, MA 02116

Please let me know if you have any questions.

Best,

Polly Flinch

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APPENDIX E

PROFESSIONAL DEVELOPMENT TRAINING AGENDA

Professional Development Training Agenda

Pre-Test (Selected Groups)

Introduction to FM 6-22 *Army Leadership "An Overview"* (1 hour)

Types of counseling (1 hour)

- Event Counseling
  - Superior or substandard performance
  - Reception and integration counseling
  - Crisis counseling
  - Referral counseling
  - Promotion counseling
  - Separation counseling
- Performance Counseling
- Professional Growth Counseling

The Leader as a Counselor (1 hour)

- The qualities of the counselor
  - Active Listening
  - Responding
  - Questioning
  - Counseling Error

Adaptive approaches to counseling (1 hour)

Counseling Techniques (1 hour)

- The four-staged counseling process
- Summary- The counseling process at a glance

Post-Test (All)

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