DIFFERENCES IN TEST PASS COURSE COMPLETION IN THE UNITED STATES AIR FORCE PROFESSIONAL DEVELOPMENT PROGRAM

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Abstract

The U.S. Department of the Air Force spends countless hours and dollars trying to develop the most highly trained and educated personnel to accomplish the Air Force mission. The purpose of this study was to determine whether there were differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6), the extent of differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6), and whether airman having a secondary or higher AFSC category code or a CCAF degree affected the course pass/fail differences. The study was further designed to determine to what extent there were differences in the number of airmen who pass PME courses and whether the differences in the number of airmen among the PME courses were affected by the attainment of a CCAF degree. In addition, the study examined whether there was a difference in the number of airmen who pass CDC courses and the number of airmen who pass PME courses.

This study utilized a causal-comparative research design to examine whether airman passed or failed CDC and PME courses. The population for this study included professional, enlisted military personnel with 1-30 years of experience. The target group consisted of active duty and traditional guard members located at an Air National Guard base in the Midwest. Data were collected utilizing an Air Force computer program that provided information on PME and CDC course enrollment, completion, and pass/fail course completion for each Airman located at an Air National Guard Base in the Midwest from 2005 to 2010. Quantitative data were analyzed utilizing a χ^2 tests of equal percentages, and a *z* test for two proportions for the six hypotheses in this study.

The results of the study indicated that airmen tended to pass AFSC category code 1, 2, and 3 tests more than would be expected by chance. When examining airmen with a secondary or higher AFSC category code, no significant impact on AFSC category code pass or fail course completion was found. The results indicated having a CCAF degree did not affect the results among AFSC category codes (1-6) or Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA). Airmen tended to pass ALS and SCNOA tests more than would be expected by chance. Airmen pass AFSC category code tests (1-6) with greater frequency than did airmen completing ALS, NCOA, and SNCOA PME courses.

Dedication

This dissertation is dedicated to all of those who have supported me on this difficult journey of accomplishing my goal and dream of completing my doctorate. First, I want to say I appreciate and respect the challenges faced by military personnel in trying to complete training and education requirements while accomplishing the ongoing high-level operations tempo faced in the current world conditions. Each and every member of the military has my utmost respect for the sacrifices made to protect this great nation.

To my wonderful children, I say thank you for your love and support throughout this process. Kelsey Dru, I appreciate the evenings you sacrificed to stay with your brother, so I was able to attend class. I am grateful for our ongoing conversations, especially convincing me that quitting is not a trait allowed in our family. Jace Daniel, I am grateful for your continued patience while I spend countless evenings revising, typing, and muttering to myself. Both of your sacrifices as I have taken this journey are very much treasured. It is my hope that both of you know that hard work and determination will help you achieve your goals and dreams. Thank you for being so wonderful.

To my dear friend Thomas, I want to thank you for the ongoing positive energy and messages. I am grateful for the support you have provided me during this process and know that I value the wisdom and guidance your words provided. Michael, thank you for providing a little comic relief when needed. It is my hope I provide the same relief from frustration as you are finishing your journey. Angelia, thank you for helping me have faith in my ability and keeping me in prayer. Last, but certainly not least, to my Mom and Jim, thank you for believing in me.

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CHAPTER ONE

INTRODUCTION

Air Force Policy Directive 36-26 (U. S. Department of the Air Force, 2011) demonstrated the Air Force Continuum of Learning (AF CoL) and was developed to meet the challenges of a broad range of military operations by incorporating education, training, and experience to form a professional corps. Training content must focus on individual and total force development by utilizing career-long, deliberate processes. Incorporating the AF CoL directive translates to a military force better prepared to meet the Air Force (AF) mission requiring instructional programs to provide personnel skilled in air, space, and cyberspace power in the conduct of war (U. S. Department of the Air Force, 2011). Through these instructional programs, personnel acquire the skills and knowledge necessary to make calculated decisions and become strategic thinkers and planners, while strengthening the ability and skills of Air Force personnel to lead, manage, and supervise (U. S. Department of the Air Force, 2010a).

Developing Airmen through a deliberative process is one of the AF priorities (U. S. Department of the Air Force, 2011). The AF CoL practices focus on a Total Force Development (Total FD) concept consisting of education and training programs combined with hands-on experience. The Total FD concept is a policy directive driven by the Secretary of the Air Force. Air Force Instruction 36-2301 focuses military airman training to include Executive Education (EE), Professional Military Education (PME), Career Development Courses (CDC), as well as undergraduate and graduate degrees attained through civilian or military higher education institutions (U. S. Department of the Air Force, 2010a). Education programs focus on building knowledge through

ancillary training (Self-aid and buddy care, sexual assault programs, chemical biological warfare courses as well as numerous other additional courses), flying, and expeditionary (deployment) preparation (U. S. Department of the Air Force, 2010a). Experience is a culmination of education and training leading to active participation and involvement by an airman. Integrating this education process leads to educated airmen capable of meeting mission requirements. It is essential in today's military with elevated deployment tempo, high threat levels, and mission tasks that AF airmen be well trained and prepared for duty. By being prepared to meet the AF training priorities, airmen are better equipped to support national security and military objectives (U. S. Department of the Air Force, 2010a).

AF enlisted airmen higher education opportunities are unique in that individuals have a chance to receive an Associate in Applied Science degree from the Community College of the Air Force (CCAF) as part of the integrated training process (Alston, 2011). The CCAF program requires 64 credits for degree completion. An airman is required to complete 15 general education requirements (or credits) from a civilian institution in conjunction with the Air Force Specialty Code (AFSC) requirements. All enlisted airmen must achieve a Journeyman (5) level (on-the-job training) in the respective AFSC to qualify for degree completion (U. S. Department of the Air Force, 2010c). A journeyman level is an airman who is proficient in performing assigned military duties independently. The CCAF degree has the potential for transferring to a number of military friendly institutions (regionally and nationally accredited) to complete a bachelor degree with only 60 additional credit hours (Alston, 2011). In as little as 3-5 years, airmen who are

focused and committed to their education can achieve the highest levels of training required for the assigned duty AFSC as well as completion of college education.

PME and CDC courses assist in meeting Total FD requirements by providing the knowledge base for training and education by leading the member to execute on-the-job skill applications in a proficient manner (U. S. Department of the Air Force, 2011). In addition to meeting AF Total FD priorities, PME and CDC courses assist an airman in attaining rank, become competent with duty positions, and ensure a well-trained and educated force prepared to meet the evolving AF mission (U. S. Department of the Air Force, 2000). For training to meet the demanding levels established by the Secretary of the Air Force, there must be continual monitoring and evaluation of CDC and PME courses. Air Force Instruction 36-2201 (U. S. Department of the Air Force, 2010c) established training managers as key personnel assigned to evaluate and monitor the training progress of airmen. These individuals are responsible for ensuring the unit has highly competent and skilled personnel to perform duty positions.

All squadrons are required to have a training manager assigned. Tan (2010) reported right sizing of the Air Force could result in cutbacks for the Unit Training Manager (UTM) positions. If a full-time, assigned UTM position was cut, a training manager would become an additional duty position. Air Force Instruction 36-2201 stipulates the additional duty position should not detract from primary AFSC duty assignments (U. S. Department of the Air Force, 2010c). An individual appointed as an additional-duty training manager has an assigned duty AFSC, unrelated to training, but is required to monitor and evaluate training progress for a unit (or flight) in addition to the regular job assignment. This cut would result in an individual with a full-time duty

position being required to complete all duties an otherwise full-time training manager would perform and could create difficulties when trying to ensure high levels of training are occurring when personnel are filling two duty positions.

Air Force Instruction 36-2201 specifies that a Unit Training Manager (U. S. Department of the Air Force, 2010c):

- Functions as a key staff member responsible for overall management of the unit-training program.
- Operates as training consultants to unit members to determine if high-quality training programs are being utilized.
- Acquires an understanding of the unit mission as well, as how each work center contributes.
- Develops, manages, and conducts training to support mission requirements.
- Advises and assists commanders in executing training responsibilities.
- Prepares a budget to support training requirements.
- Interviews newly assigned personnel to explain training procedures and requirements.
- Initiates required training documents as stipulated by Air Force Instruction.
- Conducts a comprehensive trainee orientation…within 60 days (90 days for air reserve components).
- Develops and coordinates training policy and program changes.
- Ensures all work centers have a Master Training Plan.
- Conducts a Staff Assistance Visit (SAV) of training programs.

- Identifies training resources and coordinates training resources required from other training providers.
- Screens annual and out-of-cycle training request.
- Provides current Career Field Education Training Plans (CFETPs), Specialty Training Standards (STSs), and Air Force Job Qualification Standards (AFJQSs).
- Instructs the Air Force Training Course. (para. 6.6)

The UTM job description demonstrates the significant number of duties required of an individual performing the training position. Maintaining a high-quality program as well as performing with high levels of competency in the assigned AFSC can be extremely difficult for an additional-duty training manager. The additional-duty training manager, while trying to perform two full-time duty positions, can become overwhelmed and unable to maintain training records as designated in the instructional guide. This results in lower levels of competency and knowledge in Airmen (U. S. Department of Air Force, 2010c; J. Braman, personal communication, July 30, 2010). Significant issues might be created for the Commander in his role in managing training programs and upgrading proficiency training of trainees. If the assigned training manager is unable to adequately manage both their assigned AFSC and the additional duty UTM duties, this could cause difficulties in meeting the established AF CoL Total Force training requirements and timelines (U. S. Department of the Air Force, 2011; J. Braman, personal communication, July 30, 2010).

Background

The ideal training and developmental model supported by the AF includes rigorous education, and strong experience gained through CDC and PME courses (Geraghty, 2010). Upgrade training and on-the-job-training (OJT) are two mission essential pieces of Airmen development. "CDCs are designed to provide the information necessary to satisfy the career knowledge component of OJT" (U. S. Department of the Air Force, 2010b). Air Force Instruction 36-2201 provides the mandatory core tasks identified in the Airman's Career Field Education and Training Plan (CFETP) necessary to complete upgrade training. The CFETP is the comprehensive training document that specifies education and training requirements, training resources, and minimum core task requirements for all assigned AFSC (U. S. Department of the Air Force, 2011; U. S. Department of the Air Force, 2010c).

Every career field in the Air Force requires an airman to attend an initial skill level training referred to as Technical Training School. Members begin at skill level one, which is basic entry level in a career field (U. S. Department of the Air Force, 2010c). An example of the AFSC assignment process for the training of a newly appointed training manager would be an AFSC of 3S211, which this identifies the member as a one-skill level in the AFSC or job performance area.

An AFSC is a classification tool for training that identifies the area of duty a member is capable of performing. The first position of an AFSC is a Career Group. In the above-listed example, the number 3 identifies support. The second character, S, combined with the first provides career field, 3S. The third character, 2, used in conjunction with the first and second provide the career field subdivision, which in the

example is 3S2. The fourth identifying marker provides skill level, and the fifth is the specific AFSC marker. Utilizing the example from the previous paragraph, a newly graduated Technical School airman would move from a 3S211 to a 3S231 designation. At this level of training, the airman is classified an apprentice, or 3-level (U. S. Department of the Air Force, 2010c).

Once an airman completes training from the assigned technical school (3-level), training toward a journeyman (5-level) is automatic. At this point in training, an airman's enrollment in the AFSC specific CDC's occurs, and the individual begins on-the-job training. Skill level CDCs are professional development courses mandatory for progression in the assigned career field. As a journeyman, an airman is given a minimum of twenty-four months (twelve months if retraining) to complete the assigned UGT. For the example provided above, if the member completed the journeyman level UGT as required, the AFSC would change from 3S231 to 3S251, which makes the airman a 5-level journey.

The Craftsman level is the next stage in the upgrade training process. A member must be a Staff Sergeant (SSgt) who has completed all 7-level upgrade CDCs (if required) and applicable core tasks as identified in the CFETP. Some career fields require an in-residence skill level course in addition to the CDC and OJT to achieve the 7-level upgrade. Once an airman has completed a minimum of twelve months UGT (six-month minimum if retraining) and the requirements mentioned above, they are eligible to be upgraded (U. S. Department of the Air Force, 2010c). For the example provided, the airman would be assigned the AFSC 3S271. The tables found in Appendix A include the category codes for the six AFSC groups examined in this study.

The AF has designed the PME program to meet specialized knowledge requirements while improving the performance of airmen and preparing them to assume higher-level job responsibilities (U. S. Department of the Air Force, 2010a). PME courses at the ALS, NCOA, and SNCOA levels require completion for an airman to progress in rank structure. Air Force Instruction 36-3401 indicated the essential skills that would be acquired by completing PME courses, included intuition, imagination, and creative techniques increasing the ability to perform duty assignments more proficiently (U. S. Department of the Air Force, 2000). Information gained by participating in PME courses can be critical for success as an AF leader.

PME courses are designed for specific rank levels ensuring a member has adequate training and opportunities to understand leadership roles that may be expected once training has been fulfilled. The member is required to complete Airman Leadership School (ALS) for promotion to Staff Sergeant, Non-Commissioned Officer Academy (NCOA) to progress as a Master Sergeant, and Senior Non-Commissioned Officer Academy (SCNOA) for promotion to Senior Master Sergeant. Appendix B provides a full explanation of ALS, NCOA, and SNCOA courses. Members who successfully complete PME courses, which promote quality practices have demonstrated stronger leadership capabilities, support professional networks, and embrace new technologies (U. S. Department of the Air Force, 2000). Ultimately, professional development ensures a member has the tools for success and is prepared to meet the AF mission.

The population for this study included professional, enlisted military personnel consisting of active duty and traditional members of the Air National Guard stationed at an Air National Guard Base located in the Midwest. There were approximately 1,000

personnel assigned at this location. All personnel during their military career are required to complete CDC and PME courses. Personnel are required to utilize their UTM to schedule a testing session with the test control officer on the base.

The test control officer is required to enter biographically identifying student data into the E-Exam computer system establishing a user ID for each individual testing (J. Braman, personal communication, July 30, 2010). As personnel arrive at the testing center, each airman who is testing must provide an ID card that verifies identity. At the scheduled time of testing, the test control officer takes the members into the secured testing room where they are placed at assigned computers. Room assignment for testing is done randomly. If two people are taking the same exam, they are located where there will be no opportunity for test compromise. Once all airmen are in the testing room, the test procedures are provided. Each member receives instructions for logging onto the computer, the time allotted for the test they will be taking, and procedures to follow if they have questions during the exam. At that time, each airman verifies the exam number and course title to ensure the airman is taking the correct test. Once all airmen have verified the information is correct, the test proctor starts the timer (J. Braman, personal communication, July 30, 2010).

The test control officer (TCO) stays in the controlled testing facility during the administration of the exam. When an airman completes the exam, the requirement is to raise their hand to notify the TCO. The TCO enters the administrative password and provides the airman information on the percentage earned and whether the exam was a pass or fail. Once all tests are completed, the TCO compiles all test data and submits using a secure connection through the Internet to the Course Development, Student

Administration, and Registrar (CDSAR) program. The submitted scores are posted to the airman's CDSAR profile typically within 3-5 days from the date of the exam. The airman must wait until a score posts prior to taking another exam in the CDC or PME series (if there is more than one volume in the set). This process ensures each airman is given the same opportunity for success during testing (J. Braman, personal communication, July 30, 2010).

Statement of Problem

The purpose of Air Force Training is to ensure each individual is prepared to handle the AF mission (U. S. Department of the Air Force, 2010c). The core competencies include developing airmen, integrating operations, and achieving the technology to fight wars. PME and academic education enhance performance in each phase of an airmen's duty as they progress through upgrade training and CDC courses while building a foundation of leadership abilities (U. S. Department of the Air Force, 2000). Training Managers are integral for monitoring member development and assist supervisors in ensuring the education of airmen is a priority. For a training program to be successful, all stakeholders including the training manager(s), supervisors, trainees, commanders, and other personnel identified to assist in training must take an active role (U. S. Department of the Air Force, 2010c).

Developmental Education/Training spans a member's entire career and provides the knowledge necessary for a member to develop, employ, and command forces. Improving the success of airman completing CDC and PME courses would expand the ability to meet Air Force needs, lead to promotion opportunities, and ensure the training program is focused on achieving the Air Force Mission. It is important to know which

AFSC Category Codes and PME CDC programs are achieving the highest pass course completion. Learning the highest category code course pass completion may provide an opportunity to learn if there are differences in upgrade training conducted in career field areas achieving higher levels of success.

Purpose Statement

The first purpose of this study was to determine whether there are differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6). The second purpose was to determine to what extent the differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6) are affected by whether the airmen have a secondary or higher AFSC category code. The third purpose of the study looked at to what the extent of differences is in the number of airmen who pass CDC courses among the AFSC category codes (1-6) were affected by whether the airmen have a CCAF degree. The study further looked at what whether there were differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior-Non-Commissioned Officer Academy (SCNOA). The fifth purpose of the study was to determine whether the differences in the number of airmen among the PME areas of Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SNCOA) are affected by the attainment of a CCAF degree. The final purpose of the study was to determine whether there is a difference between the number of airmen who pass CDC courses and the number of airmen who pass PME courses.

Significance of the Study

A well-rounded training program ensures personnel are instructed at the highest level and are more capable of achieving the AF mission. High levels of training bring fundamental changes in the culture and delivery of training. If the UTM is carefully monitoring PME and CDC scores, this ensures desired learning outcomes for the AF mission (Leonard et al., 2001). A UTM who monitors CDC and PME scores establishes a guideline for testing to ensure a thorough training program exists, which helps members achieve success in their CDC or PME coursework. There is an expectation by the Air Force that CDC and PME course materials are primarily the responsibility of the airman.

However, supervisors and training managers must provide guidance and support that reinforces the subject material for an individual to be responsible for the learning experience (Boyce, Wisecarver, & Zaccaro, 2005). Given an inadequate amount of documentation in the area of military professional development, this study is a key to understanding which areas of CDC and PME result in the highest pass course completion. The data provide pass/fail course completion among AFSC areas. While enlisted personnel make up 80% of the Air Force workforce, the outcome of PME and education for enlisted personnel lack verifiable data outcomes. The Mission Support Group commander authorized the research study based on the perception that having an idea as to which AFSCs had higher pass course completion could benefit Base and Unit training managers in managing training programs. Data outcomes provide an opportunity for Base Education and Training Managers to work with UTMs and additional duty UTMs to determine if an airman's successfully completing AFSC courses is linked to career field, style of learning, reinforcement provided by supervisors, or another cause. The results of

this study could be used to examine the training programs of the ALS, NCOA, and SCNOA programs achieving higher pass course completion to improve training for those members who are not as successful in CDC and PME courses.

Delimitations

Delimitations of this study are boundaries established by the researcher to complete the study. The first confine for this study was the process of evaluating the success of student airmen. This process was limited by confining data to a list of personnel scores taken from Course Development and Student Administration/Registrar System (CDSAR) for CDC and PME courses. The second was utilizing scores from only members of the Air National Guard assigned to an Air National Guard Base in the Midwest enrolled in career correspondence courses from January 2005 to December 2010.

Assumptions

For this study, assumptions were defined as something taken for granted or believed to be accurate. The operational purpose of this study was deemed reputable by the databases and information reviewed. In accordance with this, the following assumptions are made:

1. The data for pass and fail completion acquired from the Air Force database were accurate.
2. Participants were briefed on how completing CDC and PME courses affects training programs and the mission. If an airman has an understanding as to why course completion enhances career training opportunities, it can influence an airman's willingness to complete the course material successfully.

3. The UTM (additional duty training manager), supervisor, and commander understood their role in the professional development of personnel.
4. Airmen were briefed on the scores required to pass correspondence courses. If an airman fails, they could be removed from duty or discharged from the military.
5. The knowledge airmen have of the PME/CDC course is reflected by the score received on the end of course exam.

Research Questions

The following research questions were examined to determine if there were any significant aspects identifiable that would affect the course pass/fail completion of CDC and PME training courses.

RQ1. To what extent are there differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6)?

RQ2. To what extent is the difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) affected by whether the airmen have a secondary or higher AFSC category code?

RQ3. To what extent is the difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) affected by whether the airmen have a CCAF degree?

RQ4. To what extent are there differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA)?

RQ5. To what extent are the differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA) affected by whether the airmen have a CCAF degree?

RQ6. To what extent is there a difference in the number of airmen who pass CDC courses and the number of airmen who pass PME courses?

Definition of Terms

There are military specific items related to professional developments that require further explanation. To minimize confusion and enhance the understanding of the military training program, this section provides definitions for those terms.

Air Force Specialty Code (AFSC). An AFSC is an alphanumeric code used by the Air Force to identify the assigned duty position of an airman. They consist of five characters that delineate individual training levels as well as duty specific position requirements (U. S. Department of the Air Force, 2010c).

Academic mission-related courses. These include courses offered by an academic institution, which meet current and projected performance requirements essential to the Air Force mission (U. S. Department of the Air Force, 2002a).

Career Development Course (CDC). A career development course has been designed as an independent study course for enlisted personnel. It was created to provide a comprehensive, content specific knowledge for on-the-job-training (U. S. Department of the Air Force, 2010c).

Career Field Education and Training Plan (CFETP). A CFETP is a comprehensive training document used to identify education and training requirements,

training resources, and minimum core task requirements for an AFSC (U. S. Department of the Air Force, 2010c).

Community College of the Air Force (CCAF). CCAF is an accredited institution of higher learning dedicated to the enlisted members of the United States Air Force (Alston, 2008).

Education Center. An education center is a facility on a military installation that includes offices, classrooms, laboratories, and other spaces necessary for the education of airmen. The center is staffed with professionally qualified personnel who are familiar with voluntary education programs (Department of Defense, 1997).

Formal Training Plans (FTP). FTPs are written documents established to outline a formal training and development program tailored to an individual's needs (U. S. Department of the Air Force, 2002a).

Internship. An internship is a performance-based, documented system based on an Air Force specialty code that may include correspondence courses, on-the-job training, and proctored examinations (Alston, 2008).

Master Task List (MTL). This is a list containing 100% of tasks performed within a work center. The MTL contains the CFETP and locally developed training requirements for duty and UGT performance (U. S. Department of the Air Force, 2010c).

Master Training Plan (MTP). MTL is a comprehensive plan developed to ensure completion of work center requirements established by a Master Task Listing. The MTP provides milestones for task and CDC completion and prioritized deployment tasks (U. S. Department of the Air Force, 2010c).

Mission. The goal of military education is to prepare graduates to develop, employ, command, research, and champion air, space, and cyberspace power at all levels by inspiring and developing enlisted leaders with the moral framework of integrity, service, and excellence (Alston, 2011).

On-the-Job Training (OJT). OJT is a hands-on training conducted to ensure personnel are certified in skill level and job qualification training (U. S. Department of the Air Force, 2010c).

Professional Military Education (PME). PME is a specialized professional continuing education program focusing on scientific, technological, managerial, and other professional expertise to meet Air Force needs. The PME course educates Airmen on the capabilities of air and space power and their role in national security. In addition, the course is designed to focus on the knowledge and abilities needed to develop, employ, command, and support air and space power at the highest levels (Alston, 2011).

Secondary or Higher AFSC Category Code. A secondary or higher AFSC category code refers to personnel who were assigned a duty position, completed all training necessary to meet the 5-level upgrade training (or were moved due to an AF mission critical need prior to achieving the 5-level) and were either moved or requested to transfer to a new duty position giving an individual an additional AFSC category code.

Total Force Development (Total FD). Total FD is a force developmental program that includes institutional and occupational components used to integrate education and training programs with experience (U. S. Department of the Air Force, 2008).

Training. Training is a structured plan designed to gain skills, knowledge, and attitudes necessary to meet AFSC performance requirements (U. S. Department of the Air Force, 2008).

Training Manager. This is an individual assigned to create, procure, and conduct training development programs while managing the budget, enhancing personnel skills, and helping achieve better business results (U. S. Department of the Air Force, 2010c).

Training office. This is the location on base where the training function and civilian education are located (U. S. Department of the Air Force, 2002a).

Specialty Training Standard (STS). STS is an AF publication that outlines task and knowledge training required at 3-5-7 skill levels for an enlisted AFSC (U. S. Department of the Air Force, 2010c).

Upgrade Training (UGT). UGT is a mandatory training program designed to lead a member to attain higher skill levels within an AFSC (U. S. Department of the Air Force, 2010c).

Overview of the Methodology

This study utilized a causal-comparative research design to examine course completion whether airman passed or failed CDC and PME courses. The population for this study included professional, enlisted military personnel with 1-30 years of experience. The target group consisted of active duty and traditional members located at an Air National Guard in the Midwest. Data were collected utilizing an Air Force computer program that provided information on PME and CDC course enrollment, completion, and pass/fail course completion for each Airman located at an Air National Guard Base in the Midwest from 2005 to 2010. Quantitative data were analyzed

utilizing, χ^2 tests of equal percentages, and a *z* test for two proportions for the six hypotheses in this study.

Organization of the Study

This study studied pass/fail course completion of three levels of Professional Military Education (PME) and six categories of Career Development Course (CDC) codes upon which airmen were assessed. Included in chapter one was an overview of essential aspects of the Air Force training mission. In addition, the delimitations of the study were reviewed. The research questions examined during the study were overviewed. A definition of terms necessary for understanding the military training process was included as well as an overview of the methods employed in the study. The literature available on professional development including adult learning styles, instructional methods for adult learners, and studies conducted on professional development for the military was presented in chapter two. The research methods for conducting the study are provided in chapter three. Chapter four includes the results of the data analysis. A summary of the study, an interpretation of the data analyzed, findings related to literature as well as additional recommendations for future research are provided in chapter five.

CHAPTER TWO

REVIEW OF LITERATURE

Research has shown that basic skills and education are critical to entry-level positions in the technically demanding Department of Defense (Levy, 2001). Learning must entice a person with interest and desire. Intrator and Kunzman (2007) demonstrated when planning professional development to increase capacity and skill, one must focus on engaging the soul. Continued education is a priority for all professional workers and must utilize engaging training and activities that cultivate greater consciousness, integrity, and self-awareness. This chapter focuses on military professional development by looking at leadership capabilities, professional networking, and technology impact on military professional development. Additionally, this chapter includes a review of adult learning styles, instructional methods for adult learners, studies related to military professional development, and professional military education examinations.

Military Professional Development

Professional development (PD) should begin by helping each person articulate a personal vision by fostering a sense of shared purpose to the organization and create a deeper level understanding of thinking (Intrator & Kunzman, 2007). PD can be delivered in multiple ways including hiring consultants, classes in-residence, online training courses, and attending workshops. Leadership can utilize essential elements of PD to align with requirements necessary for credentialing or enhancing qualifications to adapt and manage changing organizations for attaining or continuing employment (U.S. Department of the Air Force 36-2302, 2001). Educating personnel is vital to develop innovative thinking and to equip the armed services member for strategic change. The

military education system's intent is to develop personnel with operational capabilities and unparalleled intellect to prepare for greater responsibilities (U. S. Department of the Air Force, 2001b). To create a more effective management of personnel, professional military education was developed as a venue for future military leaders to absorb up-to-date knowledge regarding international relations, economics, and technology (Kenney, 1996). Since the early 19th century, PME in the United States has evolved through three models of development (Kimminau, 2004).

The first model of PME was essentially the beginning, the "why" PME is important, or the goal of having PME in the military. An understanding of the background and development helps understand the transformation and development of PME models. This theory can be attributed to Sylvanus Thayer and is referred to as the Thayer model. This process of investigation by Thayer led to the formal, disciplined, and focused based training implemented at West Point. Thayer's Model became the basic concept of US PME doctrine, which is dedicated to preparing a person for a military career (Kimminau, 2004). The formal, disciplined ideals incorporated in the Thayer Model created the bones of the how and why of the military education system. The model formulated the broad training design of military personnel to operate in the formal, distinct manner during their schooling.

The second model was developed from the aftermath of the Civil War through the Spanish-American War and was established by Secretary of War Elihu Root. This theory integrated ideas from Emory Upton after an investigation of the military system identified shortfalls in personnel leadership capabilities (Kimminau, 2004). This led to a focus on improving specialized schools in the Army and Navy. Root became heavily involved in

these schools by identifying significant issues with military leadership, which resulted in a focus on mid- and top-level leadership education by re-emphasizing functional education or what can be referred to as the progressive military education system.

According to Kimminau (2004), the third model or stage occurred after World War II and included philosophies from Lieutenant General Leonard Gerow, an Army war commander. The implementation of Gerow's ideas was an effort to guide personnel who understood the employment of forces and national mobilization characteristics to utilize stronger decision-making protocols. During this period, there was a need to develop leaders capable of dealing with complex associations. Where Root focused his model on functional levels of PME, Gerow concentrated on a pyramidal strategy. These approaches created PME that concentrated on smaller groups receiving specialized instruction in specific areas rather than large groups receiving the same mass instructional training. The three models reviewed by Kimminau (2004) provided the basic developmental stages to establish a foundation to build the current military PME process.

To continue creating capable leaders who adjust to post-Cold War operations, military education must adapt by transforming expeditionary forces, exploring new forms of warfare, and adapting technical demands. Kimminau (2004) proposed three new components (modularity, flexible timing, and deliberate selection) to guide present day PME doctrine. Modularity was defined as a method of military education that groups learning into packages while flexible timing was described as providing a variety of start times for a course. Deliberate selection focused on the kind of development needed as well as focusing on the career path best suited for that leader.

These new components adapt PME to a model focusing on specialized components, creating flexibility with a group of balanced military leaders having expertise in more than one competency capable of concentrated, purposeful training able to meet the high tempo of an expeditionary force. This adaptation is essential because developmental education "will gain by breaking the old molds for training, education, and experience will be a tremendous asset to the Air Force and will also better enable you to grow and succeed professionally" (Kimminau, 2004, p. 7). A balanced force does not use a cookie-cutter approach to making all leaders the same, but rather by mixes different personnel capabilities through differentiated learning and training to benefit the force as well as the individual.

PD can be considered "self-development" as training is reliant on individuals being responsible for their learning experiences. The individual assumes responsibility for this training by making the choice about learning as well as how the process of learning takes place. The general rule for PD to be relevant as a learning tool is for the activity to be at least seven (7) hours in length, to gain and retain clear knowledge and skill that results in lasting change in the individual, and to have a definitive beginning and ending (Boyce et al., 2005). The important factor of PD is to assist a person in learning how to think, not what to think (Paschal, 2006).

The above paragraph describes the basic requirements to ensure PD is relevant for expanding knowledge. Yet, several other factors must be considered to ensure the effectiveness of PD. These components include flexibility, cognitive complexity, cultural awareness, and motivation (Larsson et al., 2006). Flexibility is essential for training, especially for military personnel. The schedule and mission for military personnel

constantly changes. If training is static and unyielding, it will not meet the needs of personnel. In addition, time for training can be minimal because of mission requirements. Important elements of PD are being adaptable and flexible to meet the needs of the learner. Engaging personnel to learn is an equally important part of the educational process.

Engagement in the learning process has been shown to determine whether an individual maintains interest and desire to continue with the learning process. "Weaving a focus on purpose, passion, and hope into professional development is no small feat" but essential to effectively involve people (Intrator & Kunzman, 2007, p. 191). If a student feels connected to the topic and ideas, there is a higher level of successful completion. PD that provides reflection and an opportunity to examine the inner life is more engaging and supportive of an individual's interest, desire, and enthusiasm to learn (Intrator & Kunzman, 2007).

Cognitive complexity is key when looking at an individual's ability and willingness to learn and the intellectual maturity exhibited. Those who maintain a high level of intellectual maturity are more apt to seek out learning and opportunities. Those with higher cognitive function are more likely to determine if they are struggling with specific areas of learning (Boyce et al., 2005). Effective learners can expand cognitive complexity by identifying strengths and weaknesses by seeking ways to expand knowledge in their areas of weakness and continued growth in areas of strength. Growth and attainment of knowledge must include an understanding of the changing world.

The world is an ever-evolving environment. Cultural awareness is essential for the military learner (Williams, 2010). The United States military is frequently utilized in

National Atlantic Treaty Organization (NATO) operations as well as working in other countries (Iraq, Afghanistan, Saudi Arabia, etc.) as advisors to enhance and improve military practices (Paschal, 2006). Sibul (2011) stated that professional military education should focus not only on gaining insight on issues and trends involved with military contingencies, but must develop intellectual abilities to interact effectively with different cultures. All leaders must have a basic understanding and knowledge of different cultural environments to be effective, not offend, and continue to grow and improve international relationships by being open-minded to cultural differences.

The motivation a student has for their learning is an essential aspect of the effectiveness of PD. There are different theories surrounding what motivates an individual to seek learning opportunities. Boyce et al. (2005) stated the elements to determine motivation include expectancy, instrumentality, and valence. Expectancy focuses on the individual believing they can achieve a certain level of performance. Instrumentality is the individual's belief whether the secondary goal (becoming a better leader) can be accomplished. Valence focuses on the value the individual gives to being a better leader. Taking these considerations together reflect an individual's propensity to utilize PD to become a better leader through continued education. If motivation is low, a person may have little or no interest in gaining greater knowledge resulting in poor leadership abilities. The essential key to maintain and extend motivation is increasing the desire to learn as well as impacting a leader's ability (Kenney, 1996).

Fuller (2013) went on to express PME is an important part of leadership development, but can be perceived as a means of checking a box to achieve promotion. Requiring a superior to certify and provide an electronic signature offers an opportunity

for the supervisor to review and discuss subject matter with the learner. In so doing, it ensures that not only is the individual learning and understanding the material, but also presents an opportunity to evaluate the development of the leader. Further tracking and evaluating of PME maintains effectiveness. By creating an assessment piece to the independent study aspect of PME, a means of incentivizing military professional development would essentially be instituted minimizing the lackadaisical attitude and it is all about promotion mindset.

Walsh (1997) reported education costs, such as those associated with PME, could be a considerable expense. Due to the expense associated with PME programs, understanding the impact and importance PME has on leadership development is essential. In addition, following the research of Fuller (2013), leadership development, despite PME being an independent study program, could be enhanced if supervisors became integrally involved in the material being learned by airmen. Learning and understanding what creates success for airmen could lead to lower costs associated with PME, increase future CDC and PME course pass completion, and potentially increase motivation.

Professional networking can be a positive tool for motivating a future leader to seek learning opportunities. Kenney (1996) stated, "[e]ducation clearly is a critical component of managing and adapting to change in any organization" (p. 52). To increase an individual's knowledge base of learning, observing role models and getting feedback on performance is essential. Individual development entails interaction of the individual with the organizational development (Larsson et al., 2006). The core of professional

development is taking the theoretical perspective gained through education and integrating learning with experience.

Adult Learning Styles

"A wise man learns from his experience; a wiser man learns from the experiences of others" (Browne, 2003, p. 20). Zacharias and Van Der Werff (2012) expressed that the importance of understanding adult education is unequivocally key in helping a leader utilize critical thinking skills gained through PD. Lewis (2006) purported that a leader can better apply the knowledge gained by working as an intern in an area where the learning can be applied in a "real-world" environment rather than classroom practice only. This internship would enhance the learning experience of the person and reinforce the training received. Many colleges and universities have led by example in this area by having students serve in internships and practicums during an undergraduate, masters, or doctoral program. This practice not only provides an experience base for the training received, but also provides professional connections for the future. A key element is to teach the individual to think and reason critically and be able to act decisively when facing uncertainty and ambiguity (Kenney, 1996). Students can benefit from having mentors or professional connections they can resource with after completion of the learning process. In so doing, this also provides additional learning experiences for students in their training.

The most effective way to meet the needs of learners in an educational environment is to adapt coursework to align with the learning style of the individual. Learning style guides problem-solving abilities and decision-making skills, as well as having an impact on attitudes and behavior toward education (Thurber, 2003). Everyone

continues to learn throughout life, but the point of difference is a focus on how an individual understands what was instructed. We consistently learn, but we do not learn the same way (Thurber, 2003). Brookfield (1995) explained, "The gradual accumulation of experience across contexts of life is often argued as the chief difference between learning in adulthood and learning at earlier stages in the lifespan" (p. 4). Childhood learning can be a driving agent for the preference adults have in attaining knowledge (Russell, 2006). Therefore, the goal must be to meet the integrated processes of learning from childhood by connecting the educational training in adulthood to the preferred style of learning.

The most frequently used methods of describing learning styles are visual, auditory, and kinesthetic learning (Russell, 2006). When using a visual style of learning, an individual prefers seeing that which they are learning. Using pictures and images, they understand the ideas and information to develop a mental image to retain knowledge. Auditory learning focuses on hearing a message. This person prefers to have someone read information during the task or may talk through a task to meet the goal. Kinesthetic learners typically do not enjoy sitting in a class or being in a lecture type of setting. This individual can be described as the "does something" person. This individual prefers interacting and performing tasks to retain knowledge (Russell, 2006).

Thurber (2003) discussed the necessity of adapting visual, auditory, and kinesthetic learning styles, so teachers are better able to meet the needs of students. Throughout a K-12 education, teachers attempt to integrate the three styles of learning to meet the needs of students in the classroom through differentiated instructional techniques. Adults have typically experienced a combination of verbal, auditory, and

kinesthetic learning throughout their basic education. While these three basic learning styles can be an integral part of the education process, there have been several theories proposed about adult learning styles. Some of these theories include Transformational Learning Theory, Informal and Incidental Learning Theory, and the Experiential Learning Model (Thurber, 2003).

Thurber (2003) explained the focus of each theory. Transformational Learning Theory focuses on knowledge that is available for learning by an individual. How we know the information is more important than what we know. Informal and Incidental Learning Theory focuses on informative knowledge. Formal learning occurs through interpersonal interactions, or by completing specific tasks. The Experiential Learning Model focuses on a four-stage learning cycle providing staged conceptual ideas of adult learning processes that offer insight on how adults adapt to education settings: 1) diverging, 2) assimilating, 3) converging, and 4) accommodating (Thurber, 2003).

An individual with a diverging learning style tends to develop alternative ideas or concepts by adapting conventional concepts. This type of learner does better in brainstorming sessions and tends to enjoy being a part of a group activity (Thurber, 2003). They are typically imaginative, like to work in the arts, and have broad cultural interests. An assimilated learner has less interest in people and more interest with abstract concepts. The assimilated style individual tends to have a high level of inductive reasoning and prefers logical deduction. If an idea is not supported by facts, a new concept or idea may likely be investigated. Individuals with converging learning styles do best when there are specific problems that require finding a correct solution. This individual tends to be unemotional and prefers dealing with things rather than people.

Those with an accommodating learning style tend to be risk takers. They might excel where it is necessary to adapt to immediate circumstances. They prefer finding opportunities for new plans and experiments (Thurber, 2003). Each individual is unique in preference for learning and understanding knowledge. The preferred learning style may affect the type and style of learning in which an individual chooses to participate.

Essentially, an individual should have an understanding as to how they best retain information, yet instruction should take into consideration the impact different learning styles have on personnel. If PD is not seen as a tool for continued growth or development, it might not be utilized. Brookfield (1995) stated, "good educational practice always meets the needs articulated by the learners themselves and that there is a uniquely adult learning process as well as a uniquely adult form of practice" (p. 1). Meaningful learning can be motivating and essential if the drive to achieve an education goal is met to increase a leader's ability to be successful in professionally developing personnel (Russell, 2006). This gain of insight and knowledge can only be accomplished if learning styles are understood. Providing a learner the opportunity to utilize PD in becoming a stronger leader by choosing areas of learning could be motivating and beneficial.

Leadership development must integrate administrative, technical, interpersonal, political, and cognitive skills. These skills cannot fully develop without education, training, and experience (Browne, 2003). "If an adult learner has control over the nature, timing, and direction of the learning process, the entire experience is facilitated" (Russell, 2006, p. 2). However, if the need to change action or information is not recognized by the learner, there may be a barrier to overcome before the desired outcomes take place

(Russell, 2006). Learning styles may significantly impact the motivation and desire of a student seeking PD. In addition, accessibility and type of PD can contribute to a learner's willingness to pursue further educational opportunities.

Instructional Methods for Adult Learners

A number of instructional methods can be utilized to provide PD. These include case studies, consultations, coaching, and distance learning (Department of Defense, 2007). While there are not right or wrong means of delivery, it is important to consider the learner when designing PD (Brookfield, 1995). As established through the discussion of learning styles, some students do well in a classroom, while others are not successful in this type of environment. Many individuals learn best utilizing a hands-on approach. The key is developing PD that meets the need for all who are enrolled. Virtual learning tools have become the "go to" method of providing PD in many organizations to minimize cost and delivery associated with providing education and training to personnel. Brookfield (1995) stated that distance learning has been regarded as a key means of how adult learning occurs. Distance learning is designed "to enhance an individual's professional development with challenging course study" appropriate to their education and experience level (U. S. Department of the Air Force, 2010a, p. 46).

Suggested benefits of distance learning include enhancements to training and personnel readiness, the ease of delivery on short notice, reduced travel costs, ease of access, and more timely training than an in-residence course. While positive aspects can be identified, there are risks identified with virtual PD. Monitoring implementation is necessary to ensure the quality of training is maintained, and the desired learning outcomes are met (Leonard et al., 2001). Kenney (1996) stated educational technologies

can deliver a great deal of information, yet the struggle comes when delivering information in facts alone is not sufficient. There must be focused direction or guidance by the instructor or program on utilizing critical thinking and analytical skills when delivering PD via distance learning if depth of learning is to be achieved.

Despite distance learning demonstrating a decline in cost to an organization and the ability to provide training to more people at a greater distance, it is important to keep in mind, "students learning from each other and absorbing the experience of their predecessors – clearly remains paramount, but this can and must be facilitated" (Kenney, 1996, p. 61). An organization must, when designing PD, find a balance between the needs of the organization while meeting the learning needs of those receiving training. Brookfield (1995) indicated that it is critical to provide adult learning that empowers, offers opportunities for critical reflection, experience, and collaboration in order to be an effective educational tool. Developmental education for adult learners needs to eliminate focus on ease of delivery, but rather benefit individual learning needs (Kimminau, 2004). The military development of PD is to enhance leadership abilities of personnel by creating personal and educational growth resulting in the implementation of PME programs.

The military designed PME programs "to enhance an individual's professional development with challenging course study" (U. S. Department of the Air Force, 2010a). To remain cost-effective and increase the efficiency of instruction, the military created an interactive, multimedia method of delivering course materials including electronically delivered training products utilizing graphics, text, audio, and video. The use of interactive multimedia can be used as a two-fold method of instruction. The course can

be a self-paced standalone program or part of an on-the-job enhancement-training program (U. S. Department of the Air Force, 2004).

Air Force training doctrine stipulated that it is imperative for people to receive proper education and training at the appropriate time to prepare forces for combat, conduct activities for all levels of war, provide special attention for joint missions, and be as realistic as possible. The goal of the Instructional System Design (ISD) process was to eliminate irrelevant knowledge while ensuring the needed skills and knowledge were acquired by students. There were four generations or roots of instructional processes proposed by Tennyson that created the basis for the Air Force ISD (U. S. Department of the Air Force, 1993). The ultimate goal of ISD is enhancing the learning experience.

The first generation of development focused on the behavioral patterns of learning and consisted of four components. These included objectives, pretest, instruction, and posttest. This system was designed to be all-inclusive with an evaluation loop for revision. The second generation adopted systems theory to manage and control the increasing complexity of the ISD processes. Behavioral learning patterns maintained a presence but became secondary to instructional development (U. S. Department of the Air Force, 1993).

The third generation of development determined ISD processes as being inflexible by not providing justification for differences in applications or situations. From this, a new model was developed to account for situational differences, by implementing phases of ISD. This manipulation allowed entry to the model at any point based on the level of the learner. At this point, cognitive theory began having an impact by utilizing cognitive skill for decision-making. The fourth generation of ISD led to advancements and

understanding about the way one learns and the growth of educational technologies such as content analysis, strategy, cost effectiveness, and management. This fifth and final model considers the complexity of ISD by implementing a troubleshooting process as well as continuous evaluation (U. S. Department of the Air Force, 1993).

The first ISD developed by the Air Force occurred in 1965 integrating concepts from system engineering, instructional technology, and behavioral and cognitive psychology to provide a consistent quality instruction product. Air Force Manual 36-2234 (U. S. Department of the Air Force, 1993) provided five steps for the original Air Force model. The first step implemented a plan for evaluating system requirements resulting in measurement of conditions, behavior, and standards for task performance. The second step, which defined the requirements for training and education, was completed by conducting a needs analysis to determine the need for training, the target population and characteristics, and the selection of instructional tasks utilizing the factors of frequency of performance, learning difficulty, and criticality.

The third step in the model was the creation of the objectives and tests determining what students should be able to do after they complete the instructional materials. This stage created the conditions under which assessment would take place as well as determining the acceptable standard of performance. The fourth step in the process is to plan, develop, and validate instruction. Course materials are produced, and the materials are given to students using the established criterion to ensure students can meet course objectives. The final or fifth step in the developmental process is an evaluation of instruction. Assessment is continued through the life of the course to determine if change, updates, or improvements need to be implemented. Through

continued evaluation and growth of the Air Force ISD Model, the process has increased the effectiveness of instruction by providing the best instruction, at the lowest possible expense, and improving time-efficiency (U. S. Department of the Air Force, 1993). Barriers to learning can exist. Identifying the situations that create obstacles and making every attempt to adapt instruction to resolve the identified issues, is the way to overcome the impediments.

Several learning conditions were identified in the Air Force Handbook 36-2235, Volume 12 that could be potential difficulties for students (U. S. Department of the Air Force, 2002b). The first difficulty identified was complex components. If a student is unable to practice or be tested on certain learning behaviors in an objective, it could be more difficult to learn or master the objective. The next difficulty is interference from previous learning. If there is a behavioral response to a previous instructional condition, it can be difficult to be receptive to a new manner of learning. Another struggle for students could be the length of memorization. If there are long lists, rules, or guidelines to be remembered, the longer the list, the more difficult it could be to retain.

If there are a number of cognitive processes to be used, it can make it difficult to retain information such as perceiving and encoding processes, making behavioral judgments, making judgments regarding a learning behavior, and identifying dissimilarity of the inputs can impede completing the learning behavior. Another issue identified could be the similarity or dissimilarity of cognitive information as well as the number of attributes that must be perceived and encoded to evaluate learning processes (U. S. Department of the Air Force, 2002b). The difficulties in learning conditions for students can be addressed with a viable success plan.

The Air Force has introduced methods to impact complications identified in student learning, which include introducing specialized technical skills, increasing memorization ability, concrete and defined concept intellectual skills, and rule-learning intellectual skills. The philosophies to overcome difficulties with learning procedural skills include providing several demonstrations of procedures or going step-by-step through material, begin with the goal and working with the student by going backward through the steps to help retain longer sets of knowledge items, providing frequent practice opportunities, identify interference, make the student aware, and encourage the desired behavior. In addition, providing knowledge on all modules of a needed skill, practicing component exam items, and exposing the student to an intellectual skill prior to introducing the entire skill might help ensure complete understanding of the provided instructional materials (U. S. Department of the Air Force, 2002b).

If there are struggles in learning verbal information, there are tools that could assist the student. If there are lengthy memorization pieces, the information could be broken into smaller components. As the elements are retained, there can be a gradual introduction until the entire component is memorized. There could be a pre-education session on similar material. In addition, a practice session on verbal memorization components could be established as well as utilizing instructional materials such as video, audio, or graphic cues to assist in identifying differences in material that may be confusing (U. S. Department of the Air Force, 2002b).

If there are difficulties in learning discriminating intellectual skills, there are practices that could be utilized. The first process that could be used is exaggerating differences. Have the student define the input, output, and process for identification.

There could be practice opportunities initiated in operational succession so students can identify differences in material, and provide practice on embedded test items. Finally, if a student is struggling with learning concrete and defined concept intellectual skills, the trainer could introduce an advance organizer that draws attention to previously learned differences between problem-solving skills or elements. There could be tasks developed for all component parts of the instruction, and the student could be taught how to combine a number of procedures by learning how to break down tasks using subtasks, steps, and actions to achieve a particular goal (U. S. Department of the Air Force, 2002b). The Air Force established definitive concepts and ideas for ideal instruction to assist students to become strong learners leading to the ultimate goal of an educated, well-rounded leader.

Browne (2003) stipulated that while the world stage becomes more complex and continually evolves, it is essential for leadership to remain constant. Browne (2003) reported that force development and leadership doctrine would be the key role in determining that leaders are prepared for their role. The Air Force defines a leader as "[o]ne who takes on responsibility and is able to motivate others to accomplish a mission or objective" (Browne, 2003, p. 5). While leadership is an essential component of today's Air Force, the focus must be on building the leader through formal training and responsibility through developing intellectual skills, attitudes, and knowledge that embrace the Air Force ethos. "Knowledge is power and learning is the means by which we put this knowledge in the hands of Airmen" (U. S. Department of the Air Force, 2008, pg. 10). Quality education can be achieved when an airman knows how to acquire this knowledge.

Studies Related to Military Professional Development

A student's ability to acquire knowledge and enhance educational opportunity will be impacted by maintaining effective faculty in the professional military education (PME) establishment. Effective faculty can have an impact the success of the airman as well as the institution. According to the United States Government Accountability Office (GAO) (2004), the Department of Defense (DOD) does not have specific performance goals or metrics for evaluating PME effectiveness. DOD accreditation has focused primarily on the quality of facilities, student-faculty ratios, and education process inputs. The Community College of the Air Force (CCAF) was activated in 1972 and is the only two-year institution focused on serving enlisted personnel with the goal of delivering educational opportunities to support the increased mid-level managerial responsibilities formally completed by the officer corps. CCAF serves the educational needs of enlisted Air Force personnel by enhancing the mission, assisting in retention, contributing to recruiting, and supporting career transition (Havron, 1998).

Niemiec (1987) reported, "[t]he Community College of the Air Force plays an important role in the development of the USAF enlisted force" (p. vii). In addition, a CCAF degree plays a vital role in keeping the USAF a viable and strong force. The research conducted by Niemiec (1987) evaluated what impact a CCAF degree would have on enlisted personnel promotion potential. Niemiec (1987) found significant relationships between early promotion and having a CCAF degree. The data in this study showed that if an individual with the rank of Staff or Technical Sergeant completed their CCAF degree early in their career, promotion opportunities occurred quicker than counterparts with similar training attributes without a CCAF degree.

Interestingly, the Niemiec (1987) study did not find similar results for enlisted personnel at the Master Sergeant level. For those that held the rank of Master Sergeant when acquiring a CCAF degree, earlier promotion potential did not occur as frequently. This study supports the benefit for enlisted personnel to pursue civilian (not just technical military training) early in their careers. Niemiec (1987) established that a CCAF degree could positively impact the career of enlisted personnel.

According to Havron (1998), the purpose of the Utah Project was to verify whether Air Force Training materials were equitable (or advanced) to other postsecondary occupational education programs available. Havron (1998) concluded that although the "Air Force training materials and curricula were equal to and in most cases, superior to those in general use" (p. 2), the Air Force lacked a system to apply the academic value of Air Force training. To address this shortfall, a meeting was held with Air Training Command, the Air Force Academy, and Air University leaders. At this conference, recommendations had been made for the formation of an Air Force Community College known as the Community College of the Air Force (CCAF), resulting in the formation of the academic institution in 1972 (Havron, 1998).

As SNCO's became responsible for performing higher-level duties, deficiencies in background and education were identified by the lack of effective leadership and managerial abilities. Havron (1998) proposed a three-fold importance for researching CCAF including producing quality technicians to meet high technology fields, skill development can be continually enhanced, and perceptions of the Air Force career can be enhanced. By guiding enlisted personnel to obtain high quality, relevant career education decisions that develop master technicians better able to meet the mission, the goal can be

accomplished. There is strong encouragement for enlisted personnel to pursue PME and formal civilian education.

Havron (1998) examined if participating in CCAF programs contributed to promotion; whether race, gender, or marital status affected promotion selection; and whether degree status, time in grade, and age contributed to promotion selection. The results of the study indicated CCAF participants and degree recipients had significantly higher levels of promotion. In addition, more time in grade led to higher levels of promotion. The research supported that PME and voluntary education programs supported by CCAF degree programs created managers who are more efficient and thus provided increased promotion potential for SNCO's.

Dike (2001) examined perceptions of critical thinking by faculty members as it pertained to instructing critical thinking in Air Force officer PME courses. According to the results of this study, critical thinking is an essential skill to have as the influence of technology and globalization of threats to the United States required quicker action. The time needed by leaders to develop contingency action plans has diminished. Dike (2001) showed that before technology played a central role in military actions, leaders had several days in which to act or react to situations.

Today, in the world of the "here and now" a leader must be able to react within hours. The United States requires a force of well-educated, competent, well-educated personnel who can adapt to and meet challenges. In his study, Dike (2001) examined whether there was a universal understanding of the definition of critical thinking, what instructional strategies and evaluation methods best fostered critical thinking, and if faculty members foster additional insights for teaching and assessing critical thinking.

The study included an examination of whether faculty worked to enhance critical thinking skills in the Air Force officer PME courses as well as evaluating instructional strategies and perceptions on the best means of expanding critical thinking among students. The majority of PME faculty educators understand the term critical thinking. Instructors believe in the importance of providing a well-rounded understanding of critical thinking to students and feel an established definition of the term "critical thinking" should exist. This definition could result in the creation of effective instructional materials (Dike, 2001).

Dike (2001) further established that the meaning and understanding of the Air Force definition regarding critical thinking skills should be introduced early in an officer's career. In addition, faculty requested workshops that would further their ability to teach instructional and evaluation skills. Most notably, assessment of the acquisition of critical thinking skills varied greatly amongst the faculty reports. This assessment should be unified within the PME institutions to ensure critical thinking skills are enhanced throughout the officer's career (Dike, 2001). Officer PD has been much more widely covered through research. There have been limited studies conducted on enlisted PD.

The United States Army faces continual high-tempo deployment and contingency factors. In order meet the operational demands, Smith (2009) and Weston (2010) recommended Army education systems are available anytime through any venue to increase participation and success. The Army education system was designed to educate, prepare, and train leaders to take on roles of greater responsibility. Primarily, the Army system currently utilizes the traditional learning process requiring students to sit in

classrooms with instructor-led classes. Given the deployment cycle of Army personnel, classroom-based instruction can be a challenge. Education courses must be adaptable to different worldwide environments (Smith, 2009).

Weston (2010) stated, "The Profession of Arms requires a flexible, military education system capable of educating military professionals wherever assigned" (p. 3). In the Army, effective training processes must be the highest priority for the institution and senior leaders to ensure professional development occurs. Priorities should emphasize creating and developing quality PME courses focused on student learning provided in an anytime, anywhere, and flexible environment utilizing skills of high-quality instructors (Smith, 2009; Weston, 2010). Continued growth and advancement of students is critical to the success of training programs, and this can only be achieved by effective, value based instruction and teachers (Smith, 2009). Lifelong learning could provide the framework to meet training and education needs for the Future Force (Wilson, 2006).

When reviewing Army PME, the evaluation process should examine the role of the organization, support provided by instructors, the content and delivery method, and the impact on student learning and achievement (Smith, 2009). Singularly, change in the education process must be guided by personal guidance of educators and leaders to affect instructional improvement. Change in education is critical to meet the demands of the student, with the goal being an improvement of the academic goals. Senior leaders have suggested desired outcomes for PME courses are lacking the anticipated leadership skill improvement due to change occurring at such a rapid implementation it is difficult for leaders and instructors to manage. As such, the Army's education system must create a

balance to maintain a combat ready, successful organization while maintaining an education system that successfully develops the soldier (Smith, 2009).

The Army's leadership has focused on an organizational learning-based process that has allowed for continuous curriculum assessment and adjustments to the learning program. Through review, Army leadership noted that adult learners must be self-directed, prefer work related and problem-solving environments, and be motivated to learn. As such, the environment encourages actions by the student to meet organizational goals. Smith (2009), following a concept introduced by McCausland and Martin, recommended 1) in order to embrace a lifelong learning concept, the Army must adapt its educational approach, 2) the Army must train and educate leaders how to think broadly, rather than just at the strategic level, and 3) distance learning technology must be provided to the leaders in order to adapt the Army educational system to meet the growing demands of junior officers and non-commissioned officers. Leader development is critical to the success of an organization. To develop quality leaders, a number of strategies have been implemented including formal mentorship, competency mapping, and 360-degree feedback assessments (Smith, 2009).

Forsyth and Muller (2011) stipulated that the integration of knowledge in the PME process should be the student's responsibility. They further purported that the shortfall for the PME institution can be related to the inability to hire and retain quality faculty as well as the requirement to conduct research, data collection, and outcome assessment.

Filiz and Jean-Pierre (2012) described employee development as a transformation of an employee's physical or cognitive abilities occurring at a personal or professional

level. Professional development focuses on expanding knowledge and skills that may enhance individual ability. Military environments have specialized technical training and skill requirements that cannot be obtained in a civilian market. Due to this, the military organization must invest in professional development of personnel. Filiz and Jean-Pierre (2012) examined how the United States Navy (USN) provides professional development and the Royal Navy's LSI 360 program. The Naval Education and Training Command (NETC) oversee the USN organization. Under this command, the Center for Personal and Professional Development (CPPD) provides oversight for the development of personnel leadership training and personal and professional development. The mission of CPPD is accomplished by providing education and training courses to officers and enlisted personnel. The delivery of programs is broken into voluntary education, personal development, and professional development (Filiz & Jean-Pierre, 2012).

Filiz and Jean-Pierre (2012) purported that voluntary education programs afford educational opportunities to sailors and their respective families to participate in college or academic skill courses. Personal development programs focus on command drug and alcohol program advisor; alcohol and drug abuse for leaders, supervisors, and trainers, personal responsibility and values education and training; command management equal opportunity; alcohol abuse; personal financial management; Navy military training; and bearings. Voluntary education programs offer sailors the opportunity to self-develop and gain further knowledge working toward college degree programs. Personal development programs provide the sailor a baseline understanding of military regulations as well as assisting them in areas identified as potential problem areas for the USN.

Professional development in the USN is focused on improving knowledge and skills through journeyman instructor training, workspace trainer, command training team indoctrination, command master chief/chief of the boat, petty officer selectees leadership course and chief selectee training programs for enlisted and officer personnel. Additionally, the PD includes a major command course, command leadership course, executive officer course, division officer leadership course, and department head leadership course parts I and II, which focus solely on officer personnel (Filiz & Jean-Pierre, 2012).

The USN training process was introduced in the 1960s upon identification of shortfalls with leadership and management skills for middle management level personnel. The Navy has historically utilized lecture, case study, role-playing, group discussion, individual homework, individual in-class presentations, and simulated activities. The USN appears to have a grasp of skill levels and knowledge required for officers to not only move up in position, but professional development by creating the Navy Leadership Competency (NLCM) that directs PD in five core competencies of leading people, leading change, accomplishing mission, working with people, and resource stewardship (Filiz & Jean-Pierre, 2012).

The goal of USN creation of the NLCM was clarification of workforce standards, create empowerment by improving performance, develop focused, equitable decisions, align individuals with the organization's business strategy, instill excellent behavior standards, and increase the effectiveness of Navy training (Filiz & Jean-Pierre, 2012). The USN PD plan is to enhance career development by retaining talented personnel, providing mentorship, and having higher levels of readiness for the mission. A premium

is placed on leadership development. Measurement of personal and professional development has relied on the fitness report and counseling record (which are at the discretion of each officer-in-charge to conduct performance counseling). The objective of the USN for this program included providing feedback and motivation (Filiz & Jean-Pierre, 2012).

The implementation of the Royal Navy's LSI 360-degree feedback model stemmed from industrial and organizational psychology. The goal was initiating an employee feedback model that allowed the individual to review personal strengths and weaknesses in comparison with superiors, peers, customers (if evaluated), and subordinates. This system adapts the traditional models of feedback to provide an all-inclusive picture of growth and development. The 360-feedback model identifies the strategic needs of an individual as evaluated by group input (Filiz & Jean-Pierre, 2012). The Navy PD model focused strongly on areas of officer development as well as Senior Non-commissioned officers. Lower-level enlistees may not fully grasp the importance of PD models, as personal development seems to be the higher priority for the USN lower-level enlistee. Neither the Army nor the USN PME models provided specific guidance on women academia needs working in or around the military.

Brown and Syme-Taylor (2012) focused on PME as seen through experience and reflections of academic staff. PME, as academia and the military, are primarily male dominated arenas. This study looked at how female academics experience PME from the female, civilian, and academic perspective. In this study, PME curriculum was targeted at developing professional capacity focused on specialist knowledge with intensive

socialization. Brown and Syme-Taylor (2012) proposed PME influences on trained personnel are a reflection of wide military culture.

O'Brien (2012) provided three distinct elements for educating the Air Force officer. Components of officer training align directly with the desired professional leadership training outcomes sought in enlisted personnel. These include technical or professional training, military instruction, and general education. Unless an airman is given an opportunity to develop qualities outside their comfort zone, the Air Force might not fully meet potential. To expand thought processes, it is essential for an airman to learn "how" to think for success in PME. Dike (2001) expressed PD as a balance of training, experience, personal effort, and education. This process must be a career-long progression for each Air Force member.

Lucchesi (2013) examined Air Force Senior Non-Commissioned Officer (SCNO) development in relationship to career development and leadership. His study proposed an evaluation of enlisted leadership skill to assess effectiveness as a leader. He further suggested that organization success is contingent on the development of a leader's ability to resolve complex issues and aid personnel. PME programs that enhance critical thinking skills can accomplish this. The question becomes whether SCNOs are being sufficiently developed to meet personnel and organizational requirements.

Lucchesi (2013) suggested the Air Force consider providing development in advanced skills and competencies in addition to advancements in PD competencies. PD can be costly, yet the investment monetarily for developing more efficient, better-prepared enlisted leadership may have a monetary return. Despite enlisted personnel

making up 80% of the Air Force workforce, the outcome of PME and education for enlisted personnel lack verifiable data outcomes.

In the Lucchesi (2013) study, there was a leadership competency design introduced to serve as the basis of organizational PD programs. The Lucchesi (2013) model proposed building aptitude in the areas of personal leadership, lead people/team, and leading the institution. Lucchesi (2013) provided that "personal leadership competencies include exercising sound judgment, adapting and performing under pressure, inspiring trust, assessing self, fostering effective communication, and leading courageously" (p. 22). Leading Teams and People focused on performance, mentoring and coaching, influencing a win/win situation, collaborating programs to maximize results, and building collaborative teamwork. Institutional leadership skills centered on organizational mission, execution and drive, shaping Air Force strategy and direction, embrace change and transformation as well as attract, train, and develop talent (Lucchesi, 2013).

The results of the Lucchesi (2013) study found training in the Air Force has failed to build strategic thinking, management, planning, and negotiation skills. The proposed leadership development program could be effective if leaders received the necessary training. In addition, it was found that PME supports the leader's career expertise by increasing depth of knowledge, exposure to new ideas, and development of an effective leader. If any of the key elements of development (training, experience, or professional training) fail to be developed, the leader may lack necessary skills for success. Individual training can be improved utilizing the Community College of the Air Force (CCAF) to achieve voluntary education goals as part of the required PME process.

Murray (2014) reported that due to PME requiring mandatory attendance, there are selectees who were not prepared, nor capable of handling the high-level critical thinking required in a PME course. One example provided was the 250 course hours required by the Command and General Staff Officer Course (CGSOC). Only 100 hours of this course focused on critical thinking. This process has rarely changed over the life course of PME despite being an essential component for successfully adapting course material to leadership function. Murray (2014) discussed a white paper article written by General Dempsey linking attendance at PME with successful growth in the military. In Dempsey's article, it was stipulated that faculty be excellent teachers. The criteria should not be focused on graduation from a PME institution to become an instructor, but rather the ability to successfully teach course material and have an understanding of the material to be taught.

Murray (2014) indicated that General Dempsey's guidance in the white paper article suggested PME include 1) selecting the brightest and best for attendance at PME, 2) instructors who would be high-quality instructors from military and civilian life, and 3) classroom instruction that would be more focused on improving critical thinking in the classroom. Murray (2014) stated, "The difference in student performance in a single academic year from having a good as opposed to a bad teacher can be more than one full year of standardized achievement" (p.13). The impact of instructor influence would be easy to relate to student attainment based on the urgency to recruit well-qualified instructors to lead PME courses, limit attendance to those who have been assessed for successful completion, and provide quality time to think about what has been learned. Forsyth and Muller (2011) stated, "We wouldn't trust our children's education to

amateurs, so why not hold PME to the same standard?" PME is essential, and the courses must be maintained to high standards and be defended regardless of whether it is deemed fashionable. This section examines literature based on Army and Navy professional development ideas, professional military education, and Air Force PME perspectives.

Professional Military Education Examinations

Air Force Handbook 36-2235 (U. S. Air Force, 2002b) identified the purpose for Air Force test development was "to assess student attainment of the behaviors specified in the terminal and enabling objectives" (p. 5). The additional objectives of testing include indicating if a class is meeting the designated objectives, identifying weaknesses or issues with instruction, evaluating an instructor's ability, and reviewing the effectiveness of the medium to facilitate learning. The two main types of assessment created by the Air Force include predictive and performance tests. A performance test requires the student to complete the function of the material learned while a predictive exam evaluates operational behavior. Testing evaluations can provide a big picture overview of student learning. The following studies are an overview of the research studies relating to military testing.

Barnhill (1991) attempted to estimate test score aptitudes of the minority U.S. Navy enlisted force. The study examined the dispersal relationship of black, Hispanic, and white enlisted personnel across U.S. Navy occupational specialties by aptitude test scores. The initial implementation of the Navy's Affirmative Action Plan (NAAP) was established in 1983 and has continued since its inception. Barnhill (1991) reported that "test scores remained a key to training and assignment" (p. 11). The Navy utilized the ASVAB test for determining if the newly enlisted minority recruits were qualified for

career field and training programs. Many new sailors joining the Navy during the post-Vietnam era were unable to qualify for technical positions. The results of the Barnhill (1991) study showed that ASVAB test scores could not be attributed to the sole disparity among occupational assignments.

Duncan (1994) suggested an approach to the Weighted Airman Promotion System (WAPS) test scores for promotion that would evaluate the impact of "double-weighing the PFE portion of the WAPS formula" (p. 2) as compared to the current evaluation system to determine if it could reduce effects of extraneous variables in impacting promotion. WAPS was created in 1968, but not fully implemented until 1970. Duncan (1994) introduced "WAPS as being composed of six weighted factors that combine measures of professional knowledge, job performance, and experience (longevity); Specialty Knowledge Test (SKT), Promotion Fitness Exam (PFE), Enlisted Performance Reports (EPR), Time in Grade (TIG), Time in Service (TIS), and Decorations" (p. 1). These factors are calculated creating a score that ranks a member in comparison to their peers for promotion purposes.

Duncan (1994) found "TIS are not as prominent for more junior enlisted personnel (E-5s) as they are when seeking promotion to E-6 and E-7" (p. 5). Data identified "if more weight were applied on the knowledge portion of the WAPS formula, less senior personnel would be promoted" (p. 5). Thus, if the approach Duncan (1994) introduced were applied, there would be more junior grade personnel selected for promotion. Duncan (1994) further provides "those more senior in SKT-exempt AFSCs appear to be more effected by the increased reliance on TIG and TIS" (p. 12). This

reliance results in less junior personnel who score well on PFE having less opportunity for promotion.

Duncan (1994) indicated that the double-weighting system approach could be "easier to understand by the enlisted force than applying a statistical adjustment" (p. 15). There is not an easy answer for determining the most effective means for the promotion of the enlisted force. For change to occur with the current system of using TIG and TIS as part of the system, it would be difficult and timely to educate personnel. It could be useful to consider using AFSC test scores, education attainment, and job performance as key portions toward promotion.

Wielsma (1996) provided that the goal of the Marine Corp is to achieve an effective fighting force by hiring and retaining the most qualified officer and enlisted personnel. The Marine Corp in their education and training processes for officer training parallel the education and training process for AF enlisted personnel. Wielsma (1996) stated Marine Corps officers are required to complete Officer Candidate School (OCS). OCS was designed as a tool to determine a Marine's desire for service. After completing the course, the officer is required to attend a six-month training course to evaluate military, leadership skills, and academic abilities. Once the six-month period is completed, total scores from highest to lowest rank the officers. These personnel are then equally distributed across the various career fields to keep an equitable balance of skills amongst all career fields.

The AF Enlisted AFSC specialty code process is designed to achieve a similar result as the Marine OCS assignment. The airmen, in basic training, are placed into high-need career fields as necessitated by the AF. Once initial training is complete, they

attend the technical training school assignment by AFSC. When the technical school specialized training is complete, the airmen move to their duty assignments and are enrolled in their on-the-job training as well as the AFSC specialty code CDCs. The airman completes on-the-job training and the end-of-course (EOC) for their assigned AFSC.

Picano, Roland, Williams, and Rollins (2006) evaluated whether "a sentence completion test (SCT) differentiates completion course for high demand military missions" (p. 207). An "SCT is considered a projective test in that the response is believed to be in part a projection of psychologically meaningful and personally relevant information" (Picano et al., 2006, p. 208). The two identifying components were resistant responding due to flippant responses and constricted or inhibited responding. Those with higher SCT verbal responses were distant from their feelings, had lower agreeableness, and experienced less positive emotions than their counterpart's experience.

Measures examined "omissions, denial, comments about the test, flippant responses, redundancies, and simple associations" (Picano et al., 2006, p. 210). The assessment candidates were evaluated using the same military skills exam and standardized psychological tests. Results demonstrated that "candidates who are high in SCT verbal defensiveness are significantly less likely to complete a rigorous military selection course" (Picano et al., 2006, p. 215). Individuals with high SCT verbal defensiveness could leave a challenging course before an individual who is low in SCT verbal defensiveness. There were no correlations identified between SCT verbal defensiveness and the elimination from courses. Additionally, it was noted, that no

relation was found between the traditional measure of personality and completion of military courses.

Picano et al. (2006) discussed that the "propensity to resist complying with the demands of SCT may be likely also to resist conforming their behaviors to expectations in the selection course" (p. 216) resulting in lower interview assessments when evaluated by psychologists for high demand missions. The findings resulted from an in-house SCT for special warriors such as Navy Seals, Army Rangers, Force Reconnaissance, and Special Forces. Before "applying these results to other operational areas, a relationship between verbal defensiveness to outcome" (p. 216) for that population must be identified (Picano et al., 2006). SCT verbal defensiveness could be used in the future to examine how effective it applies to less strenuous career fields in the military.

The Air Force Officer Qualification Test (AFOQT) is a selection tool designed to select college graduates for entry-level officer positions in the Air Force. This test is a significant tool for not only the officer corps but also the enlisted corps. Some enlisted personnel take the AFOQT with the plan to convert to the officer corps. . Due to the propensity for enlisted personnel to take the AFOQT (some successfully, others not), understanding the influence this tool impacts the Air Force career could be significant to provide a total picture of the education and training processes impacting enlisted personnel.

The test evaluates quantitative and verbal aptitudes as a predictor for officer potential. Examining the results of those in the enlisted force who take the exam could provide insight into passing course completion on AFSC exams. The AFOQT is not the only tool used by the Air Force. The Armed Services Vocational Aptitude Battery

(ASVAB) is an additional assessment utilized, but it was designed solely for placement of enlisted military personnel. There have been concerns raised as to whether there is bias against minorities and women as well as if it accurately predicts any important aspects of Air Force training (Hardison, Sims, & Wong, 2010).

The current edition of the AFOQT began being utilized in 2005. "The AFOQT consists of eleven subtests used to form five composite scores that are computed from weighted combinations of different subtests" (Hardison et al., 2010, p. 3). The subtests are "verbal abilities, arithmetic reasoning, word knowledge, math knowledge, instrument comprehension, block counting, table reading, aviation information, general science, rotated blocks, and hidden figures" (Hardison et al., 2010, p. 4). The scores from the AFOQT are used to select officers for specialized career fields, select officers in officer-commissioning sources, and awarding college scholarships. The AFOQT is considered a high-stakes test due to being the determining factor for career options (Hardison et al., 2010).

Finegold and Rogers (1985) "found that the AFOQT significantly predicts a person's passing or failing the course and his or her course grades and class rank in Air Weapons Controller training" (p. 14). Hardison et al. (2010) presented information on the most comprehensive study of AFOQT validity. This study was an examination of "9,029 nonrated officers in 37 different technical training courses between 1979 and 1983. The results of the study demonstrated that academic composites, as well as verbal and quantitative skills, have statistically significant relationships (Hardison et al., 2010). Additional information provides evidence that the AFOQT has predictive validity for a variety of officer jobs.

Hardison et al. (2010) provided further data examining the relationship between training scores and AFOQT for pilot trainees. The results show a correlation between AFOQT and job knowledge acquired during pilot training. Thus, higher performance training and success as a pilot should occur when using AFOQT verbal and quantitative scores. Due to the evidence provided, Hardison et al. (2010) supported usage of the AFOQT as an effective predictor for some duty positions and should be used to select officers. The AFOQT is presented as a useful, valid test for predicting training success without bias towards the status of an individual.

Summary

This section looked at the progress in professional development. An overview of how PD can be an essential learning tool was discussed. There was a review of how PD can benefit adult learners, but can be a hindrance if not designed to meet the needs of the all those taking the course. Adult learning styles were considered that included how the early educational influences can affect an adult learner. The manner in which PD can be delivered was presented as well as the impact distance learning has had on an organization's choice of training. This section also reviewed studies conducted on professional military education as well as an overview of PME examinations. The following chapter introduces the methods used for this study.

CHAPTER THREE

METHODS

The first purpose of this study was to determine whether there are differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6), the extent of differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6) and whether the airmen have a secondary or higher AFSC category code or a CCAF degree. The study was further designed to look at the extent there were differences in the number of airmen who pass PME among the schools and whether the differences in the number of airmen among the PME areas were affected by the attainment of a CCAF degree as well as whether there is a difference between the number of airmen who pass CDC courses and the number of airmen who pass PME courses. This chapter describes the methodology used in conducting the research study. Included in this chapter are sections describing research design, population and sample, sampling, instrumentation including measurement, validity and reliability, as well as data collection, data analysis and hypothesis testing, limitations, and summary.

Research Design

A casual-comparative research method was utilized to review categories of pass/fail rates on the different CDC/PME course levels from 2005 to 2010. According to Schenker and Rumrill (2004), casual-comparative research is designed to "examine the magnitude of differences between or among groups" (p. 117) without manipulating an independent variable. This research method was selected because it allowed a comparison of what occurred with CDC/PME testing from 2005 to 2010. The intent behind the design of the study was a review of the impact education, AFSC, and prior

CDC/PME scores would have over a five-year period on the CDC/PME end of course exam pass/fail completion. The independent variables included the types of courses and degrees, rank, and AFSC levels being tested. The dependent variable was the CDC/PME course pass/fail completion for airmen.

Population and Sample

The population for this study included all Air Force enlisted personnel who were active duty or traditional guard members stationed at an Air National Guard base in Missouri who had a minimum of one year and a maximum of 30 years of duty who completed a CDC or PME course. The sample included professional, enlisted military personnel ranging from 1 to 30 years of experience who were members of the Missouri Air National Guard.

Sampling Procedures

Purposive sampling was utilized in this study because of the researcher's experience and knowledge of an Air National Guard Base in the Midwest. A military alpha roster list of personnel assigned to the Air Wing from 2005 to 2010 from a sensitive military computer system was requested. Each person's name listed on the Master Alpha Roster was looked up in the Course Development and Student Administration/Registration System (CDSAR) to determine if they had completed either a PME or CDC exam from 2005 to 2010. Each member who took an exam during this time period was included in the study.

Instrumentation

The study is comparing the highest course pass/fail completion of testing materials utilized for AFSC category codes (1-6) as well as PME levels of ALS, NCOA,

and SNCOA (See Appendix B). Air Force Handbook 36-2234 established the goal for the instructional design of AFSC and PME courses is to establish sequences of learning that create a productive environment measuring the performance for each objective supported (U. S. Department of the Air Force, 1993). Tests are designed to ensure the material adequately evaluates desired outcomes by identifying problems or weaknesses in course material. When standards in CDC and PME courses meet desired objectives and proficiency in training occurred, the program is evaluated as effective (U. S. Department of the Air Force, 1993).

The CDC and PME testing materials contain sensitive and in some instances classified content. Due to the sensitive nature of the material and safeguarded security procedures required to avoid test compromise, it is not possible to provide example questions. The CDC test requirements can vary based on the AFSC requirements and job duties. A typical CDC course contains one to five volumes with an end-of-course exam containing approximately 100 multiple choice, short answer, or fill-in-the-blank questions. If the AFSC requires more than one set of CDCs for course completion (set A, B, and C), there is an end-of-course exam for each set of CDCs. The airman must attain 65% on each EOC exam to pass the course.

Professional Military Education Courses are based on the level of PME. The Airman Leadership Course (ALS) and Non-Commissioned Officer Academy (NCOA) require one end-of-course exam to complete the program. The tests consist of approximately 100 multiple-choice, short answer, or fill-in-the-blank questions for exam completion. The airman must achieve a 70% or higher score to pass. Senior Non-Commissioned Officer Academy (SCNOA) varies from the other leadership courses in

that it has five exams that must be completed before passing the course. There are five volumes in this course. The EOC for Volumes A-E contains between 10-25 multiple-choice, short answer, and fill-in-the-blank questions. Each of the five EOC exams must be passed with a 70% or higher for the Airman to pass the course (See Appendix B).

Measurement

For RQ1, RQ2, RQ3, and RQ6, the number of airman who passed the CDC courses among the AFSC category codes (1-6) was measured using data from the Course Development, Student Administration, and Registrar (CDSAR) system, which shows the number of airman passing by category code for the years 2005 to 2010. For RQ2, the determination of whether an airman has a secondary or higher AFSC category code was found by individually reviewing each airman's testing data through the CDSAR system. For RQ3 and RQ5, the determination of whether an airman has a CCAF degree was found by individually reviewing each airman's virtual education system record utilizing the Air Force Portal (2010). For RQ4, RQ5, and RQ6, the number of airmen who pass the PME courses among the Airmen Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SNCOA) was determined by gathering the data from the CDSAR system, which shows the number of airman passing the category code for the years 2005 to 2010.

Validity and reliability

To ensure test validity, the United States Air Force (2002) has adopted the following procedures. The process includes defining what test validity means on an AF test. Understanding the AF definition of validity is the most important aspect, as test items are a direct reflection of the course objective, and there is an equitable sample

distribution of the objectives covered in the course materials. The AF has determined a test item is valid when a student shows intellectual performance, skills can be performed from an intellectual standpoint, and the objective has been scored according to the standards established in the course objective. Test validity is evaluated by reviewing how well the test items measure the objectives, and that the test encompasses all course material within the course material, not just a limited component of the course material (U. S. Department of the Air Force, 2002b).

Air Force Handbook 36-2235 provided that test reliability in the AF is evaluated by student assessment (U. S. Department of the Air Force, 2002b). If the test items (1-5) covering each objective are reliable, and students have mastered the skill, the students always pass the objective. On the other hand, if a student fails the test items covering an objective, the test items are reviewed for reliability. There are a number of methods adopted by the Air Force to ensure test reliability. The same students are given the same test on two separate occasions, and the scores are compared to see if student outcome is the same. Important to note is that reliability can be impacted by the amount of time between tests, and how much additional content knowledge the student has acquired since the last exam session. In addition, reliability is maintained by keeping test conditions and instructions the same Air Force wide, the scoring procedures of the tests are standardized, and the length and time of the test are consistent (U.S. Department of the Air Force, 2002b).

Data Collection Procedures

The Commander of the Air National Guard Wing in the Midwest in charge of the Mission Support Group, Colonel Norman R. Brosi, Commander authorized the research comparing AFSC and PME pass/fail course completion. Written verification was provided October 24, 2011 via email (see Appendix C). An Institutional Review Board (IRB) request was submitted to Baker University (see Appendix D). Once approval was obtained from the Baker University IRB committee (see Appendix D), Air National Guard supervisor, John Braman was notified the project had been approved.

To retrieve the data, a list of Airmen located at the Air National Guard Base from 2005 thru 2010 was exported from the Military Personnel Data System (MilPDS). For each individual on the list from MilPDS, the social security number was accessed so that each airman was retrieved individually in the CDSAR military testing score site. Data were collected from MilPDS for all military members stationed at the Air National Guard Base from 2005 to 2010. Members stationed at Air National Guard Base were looked up in the CDSAR computer system. This computer system maintains names and course numbers for each CDC and PME exam completed by a military member during the AF career. If the member had taken at least one exam during the 5-year period, each course number and score were recorded. A list was created from the names with course exams taken and scores received. Once the data were documented on the spreadsheet, it was exported from Excel into IBM SPSS® Statistics Faculty Pack 23 for Windows to complete the data analysis and hypothesis testing.

Data related to the six research questions examining the pass rate course completion for CDC and PME courses was reviewed; first, secondary, or tertiary AFSCs

the airmen held; and whether the individuals had obtained a CCAF degree. In addition, an Air Force computer program titled MilPDS was utilized to determine the rank of the military member. MilPDS is an internal AF computer program containing personally identifiable information on all military members. Usage of MilPDS data is limited to only those individuals who have a need to access the data as it contains sensitive information. The Mission Support Group commander authorized the research study based on the perception that having an idea as to which AFSC and PME had higher course pass completion could benefit Base and Unit training managers in managing training programs.

Data Analysis and Hypothesis Testing

This study utilized a causal-comparative methodology for data collection and analysis. Hypothesis tests were conducted utilizing χ^2 tests of equal percentages, and a z test for two proportions.

RQ1. To what extent are there differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6)?

H1. There are differences in the number of airmen who pass CDE courses among the AFSC category codes (1-6).

A χ^2 test of equal percentages was conducted to test H1. The observed frequencies were compared to those expected by chance. The level of significance was set at .05.

RQ2. To what extent is the difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) affected by whether the airmen have a secondary or higher AFSC category code?

H2. The difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) is affected by whether the airmen have a secondary or higher AFSC category code.

A χ^2 test of equal percentages was conducted to test H2. The observed frequencies were compared to those expected by chance. The level of significance was set at .05.

RQ3. To what extent is the difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) affected by whether the airmen have a CCAF degree?

H3. The difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) is affected by whether the airmen have a CCAF degree.

Prior to conducting the hypothesis test for RQ3, the data was disaggregated by whether the airmen had a CCAF degree. A χ^2 test of equal percentages was conducted to test H3 for the airmen who had a CCAF degree. The observed frequencies were compared to those expected by chance. The level of significance was set at .05.

RQ4. To what extent are there differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA)?

H4. There are differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA).

A χ^2 test of equal percentages was conducted to test H4. The observed frequencies were compared to those expected by chance. The level of significance was set at .05.

RQ5. To what extent are the differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA) affected by whether the airmen have a CCAF degree?

H5. The differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA) are affected by whether the airmen have a CCAF degree.

Prior to conducting the hypothesis test for RQ5, the data was disaggregated by whether or not the airmen had a CCAF degree. A χ^2 test of equal percentages was conducted to test H5. The observed frequencies were compared to those expected by chance. The level of significance was set at .05.

RQ6. To what extent is there a difference between the number of airmen who pass CDC courses and the number of airmen who pass PME courses?

H6. There is a difference between the number of airmen who pass CDC courses and the number of airmen who pass PME courses.

A χ^2 test of equal percentages was conducted to test H7. The observed frequencies were compared to those expected by chance. The level of significance was set at .05.

Limitations

Limitations are classified as characteristics of the research or method design that may influence results of this study. This study had the following limitations:

1. The training managers and supervisors may have different styles and methods for training their airmen. This could make it more difficult for certain members to acquire the skills necessary to be successful complete the course in training.
2. The commanders could have different priorities for the individual unit-training program resulting in members from various units receiving different types of assistance or understanding of CDCs.

Summary

This chapter reviewed purposes of the study and provided the research questions. The selection of AF personnel was done utilizing purposive sampling. A casual-comparative research design was employed for this inquiry. Instrumentation of the study looked at testing materials for AFSC category codes 1-6 as well as PME levels of ALS, NCOA, and SCNOA. The measurement section examined how each of the variables in the research questions would be measured. The validity and reliability established for AF testing examined in this study were provided. Procedures for data collection were discussed. Data analysis and hypothesis testing were described, and the limitations of the study were reviewed. The following chapter discusses data analysis results.

CHAPTER FOUR

RESULTS

The purpose of this study was to determine whether there are differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6), the extent of differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6) and whether the airmen have a secondary or higher AFSC category code or a CCAF degree. The study further designed to look at what extent there are differences in the number of airmen who pass PME courses and whether the differences in the number of airmen among the PME areas were affected by the attainment of a CCAF degree as well as whether there is a difference in the number of airmen who pass CDC courses and the number of airmen who pass PME courses. Chapter four contains the results of the data analysis and hypothesis testing. The results of the χ^2 tests of equal percentages and *z* test for two proportions are presented.

Hypothesis Testing

The population for this study included professional, enlisted military personnel with 1-30 years of experience. The target group consisted of active duty and traditional reserve members located at an Air National Guard base in the Midwest. The IBM® SPSS® Statistics Faculty Pack 23 for Windows statistical program was used to analyze the data for this research study.

RQ1. To what extent are there differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6)?

H1. There are differences in the number of airmen who pass CDE courses among the AFSC category codes (1-6).

A χ^2 test of equal percentages was conducted to test H1. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 154.843$, $df = 5$, $p = .000$. The observed frequency for passing category 1 tests ($n = 89$) was higher than the expected frequency ($n = 50$) (see Table 1). The observed frequency for passing category 2 tests ($n = 260$) was higher than the expected frequency ($n = 156$). The observed frequency for passing category 3 tests ($n = 160$) was higher than the expected frequency ($n = 93$). Airmen tend to pass category 1, category 2, and category 3 tests more than is expected by chance.

Table 1

AFSC Category Codes (1-6) Pass Frequencies

	AFSC Category Codes (1-6)					
	1	2	3	4	5	6
Observed	89.0	260.0	160.0	25.0	5.0	14.0
Expected	50.0	156.0	93.0	21.0	2.5	8.5

RQ2. To what extent is the difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) affected by whether the airmen have a secondary or higher AFSC category code?

H2. The difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) is affected by whether the airmen have a secondary or higher AFSC Category code.

Prior to conducting the hypothesis test for RQ2, the data was disaggregated by whether the airmen have a secondary or higher AFSC category code. A χ^2 test of equal

percentages was conducted to test H2 for the airmen who had a secondary code. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 23.398$, $df = 5$, $p = .000$. The observed frequency for passing category 2 tests ($n = 16$) was higher than the expected frequency ($n = 9.5$) (see Table 2). The observed frequency for passing category 3 tests ($n = 9$) was higher than the expected frequency ($n = 5.5$). Airmen who had a secondary or higher AFSC category code tend to pass category 2 and category 3 tests more than is expected by chance. However, sample size issues caused expected values less than 5 in 50% of the six categories. Interpreting the results of this analysis is potentially compromised.

Table 2

Secondary or higher AFSC Category Codes (1-6) Course Pass Frequencies for Airmen Who Have a Secondary or higher AFSC Category Code

	AFSC Category Codes (1-6)					
	1	2	3	4	5	6
Observed	1.0	16.0	9.0	2.0	0.0	1.0
Expected	0.5	9.5	5.5	1.5	0.5	17.5

A second χ^2 test of equal percentages was conducted to test H2 for the airmen who did not have a secondary or higher AFSC Category code. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 147.170$, $df = 5$, $p = .000$. The observed frequency for passing

category 1 tests (n = 88) was higher than the expected frequency (n = 49.5) (see Table 3). The observed frequency for passing category 2 tests (n = 244) was higher than the expected frequency (n = 146.5). The observed frequency for passing category 3 tests (n = 151) was higher than the expected frequency (n = 87.5). Airmen tend to pass category 1, category 2, and category 3 tests more than is expected by chance. However, sample size issues caused expected values less than 5 in one of the six categories. Interpreting the results of this analysis is potentially compromised. Despite the sample size issues, the results of the two χ^2 tests were similar indicating that having the secondary or higher specialty code did not affect the difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6).

Table 3

AFSC Category Codes (1-6) Course Pass Frequencies for Airmen Who Do Not Have a Secondary or higher AFSC Category Code

	AFSC Category Codes (1-6)					
	1	2	3	4	5	6
Observed	88.0	244.0	151.0	23.0	5.0	13.0
Expected	49.5	146.5	87.5	19.5	2.5	8.0

RQ3. To what extent is the difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) affected by whether the airmen have a CCAF degree?

H3. The difference in the number of airmen who pass CDC courses among the AFSC category codes (1-6) is affected by whether the airmen have a CCAF degree.

Prior to conducting the hypothesis test for RQ3, the data was disaggregated by whether the airmen had a CCAF degree. A χ^2 test of equal percentages was conducted to test H3 for the airmen who had a CCAF degree. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 12.487$, $df = 5$, $p = .011$. The observed frequency for passing category 2 tests ($n = 13$) was higher than the expected frequency ($n = 7.5$) (see Table 4.3). The observed frequency for passing category 3 tests ($n = 16$) was higher than the expected frequency ($n = 9.5$). Airmen tend to pass category 2 and category 3 tests more than is expected by chance. However, sample size issues caused expected values less than 5 in four of the six Secondary or Higher AFSC category codes. Interpreting the results of this analysis is potentially compromised.

Table 4

AFSC Category Codes (1-6) Pass Frequencies for Airmen Who Have a CCAF Degree

	AFSC Category Codes (1-6)					
	1	2	3	4	5	6
Observed	3.0	13.0	16.0	4.0	1.0	2.0
Expected	1.5	7.5	9.5	2.0	0.5	2.0

A χ^2 test of equal percentages was conducted to test H3 for the airmen who did not have a CCAF degree. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 =$

145.030, *df* = 5, *p* = .000. The observed frequency for passing category 1 tests (*n* = 86) was higher than the expected frequency (*n* = 48.5) (see Table 5). The observed frequency for passing category 2 tests (*n* = 247) was higher than the expected frequency (*n* = 148.5). The observed frequency for passing category 3 tests (*n* = 144) was higher than the expected frequency (*n* = 83.5). Airmen tend to pass category 1, category 2, and category 3 tests more than is expected by chance. However, sample size issues caused expected values less than 5 in one of the six categories. Interpreting the results of this analysis is potentially compromised. Despite the sample size issues, the results of the two χ^2 tests were similar indicating having the CCAF degree did not affect the results among the AFSC category codes (1-6).

Table 5

AFSC Category Codes (1-6) Pass Frequencies for Airmen Who Do Not Have a CCAF Degree

	AFSC Category Codes (1-6)					
	1	2	3	4	5	6
Observed	86.0	247.0	144.0	21.0	4.0	12.0
Expected	48.5	148.5	83.5	19.0	2.0	6.5

RQ4. To what extent are there differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA)?

H4. There are differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA).

A χ^2 test of equal percentages was conducted to test H4. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 140.273$, $df = 2$, $p = .000$. The observed frequency for passing ALS tests ($n = 189$) was higher than the expected frequency ($n = 106.5$) (see Table 6). The observed frequency for passing category 2 tests ($n = 70$ was higher than the expected frequency ($n = 75$. The observed frequency for passing category 3 tests ($n = 237$ was higher than the expected frequency ($n = 135.5$). Airmen tend to pass ALS and SNCOA tests more than is expected by chance.

Table 6

PME Course Pass Frequencies by School

	Schools		
	ALS	NCOA	SNCOA
Observed	189.0	70.0	237.0
Expected	106.5	75.0	135.5

RQ5. To what extent are the differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA) affected by whether the airmen have a CCAF degree?

H5. The differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA) are affected by whether the airmen have a CCAF degree.

Prior to conducting the hypothesis test for RQ5, the data was disaggregated by whether or not the airmen had a CCAF degree. A χ^2 test of equal percentages was conducted to test H5 for the airmen who had a CCAF degree. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 10.32035$, $df = 2$, $p = .003$. The observed frequency for passing ALS tests ($n = 19$) was higher than the expected frequency ($n = 10.5$) (see Table 7). The observed frequency for passing SNCOA tests ($n = 17$) was higher than the expected frequency ($n = 11$). Airmen tend to pass ALS and SNCOA tests more than is expected by chance.

Table 7

PME Course Pass Frequencies by School for Airmen Who Have a CCAF Degree

	Schools		
	ALS	NCOA	SNCOA
Observed	19.0	12.0	17.0
Expected	10.5	13.5	11.0

A χ^2 test of equal percentages was conducted to test H5 for the airmen who did not have a CCAF degree. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. The results of the test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 130.496$, $df = 5$, $p = .000$. The observed frequency for passing ALS tests ($n = 170$) was higher than the expected frequency ($n = 96$) (see Table 8). The observed frequency for

passing NCOA tests (*n* = 58) was higher than the expected frequency (*n* = 61.5). The observed frequency for passing SCNOA tests (*n* = 220) was higher than the expected frequency (*n* = 124.5). Airmen who did not have a CCAF degree tend to pass ALS, and SCNOA tests more than was expected by chance. The percentage results between those with a CCAF degree and those not having a CCAF degree are similar.

Table 8

PME Course Pass Frequencies by School for Airmen Who Do Not Have a CCAF Degree

	Schools		
	ALS	NCOA	SNCOA
Observed	170.0	58.0	220.0
Expected	96.0	61.5	124.5

RQ6. To what extent is there a difference between the number of airmen who pass CDC courses and the number of airmen who pass PME courses?

H6. There is a difference between the number of airmen who pass CDC courses and the number of airmen who pass PME courses.

A *z* test for two proportions was conducted to test H6. The two sample proportions were compared. The level of significance was set at .05. The results of the *z* test for two proportions indicated a statistically significant difference between the two values, $z = 2.429$, $p = .015$ (See Table 8). The sample proportion for the CDC courses ($p = 553/662 = .835$) was higher than the sample proportion for PME courses ($p = 496/634 = .782$) indicating that airmen who take CDC courses have higher course pass completion than those completing PME programs.

Table 9

CDC and PME Pass Frequencies

	CDC	PME
Passed	553	496
Failed	109	138
Total	662	634

Summary

Chapter Four contained the results of the data analysis and hypotheses testing related to course pass/fail completion of AF CDC and PME curriculum and whether having a CCAF degree would impact CDC and PME course pass completion. The results of χ^2 tests of equal percentages and a *z* test for two proportions were presented. Chapter Five includes Study Summary, Findings Related to the Literature, and Conclusions.

CHAPTER FIVE

INTERPRETATION AND RECOMMENDATIONS

Chapter five includes a summary of the study by providing an overview of the problem, the purpose statement and research questions, the methodology, and major findings of this research. A discussion of the findings related to literature is covered. The implications for action, recommendations for future research, and concluding remarks end the chapter.

Study Summary

The section includes an overview of the problem. Additionally, the purpose of the study and a restatement of the research questions is provided. A review of the methodology and the major findings is included provided in the data analysis. Finally, findings related to research will be covered in this segment.

Overview of the Problem

The purpose of Air Force Training is to ensure each individual is equipped physically and mentally to handle the AF mission (U. S. Department of the Air Force, 2010c). The AF core competencies include developing airmen, integrating operations, and achieving the technology to fight wars. PME and academic education enhance performance in each phase of an airmen's duty while building a foundation of leadership abilities (U. S. Department of the Air Force, 2000).

Developmental Education spans an airman's career. Training and education provide the knowledge necessary to mature, expand, and develop subordinates. Improving the success of airman completing CDC and PME courses would expand the ability to meet Air Force needs, lead to promotion opportunities, and ensure the training

program is focused on achieving the Air Force Mission. It is essential to implement effective education and training protocols to know the AFSC category codes (1-6) achieving the highest course pass completion pass. Acquiring this information provides an opportunity to examine if there are differences in upgrade training conducted in AFSC category code career field areas (1-6) leading one group to achieve higher levels of success.

Purpose Statement and Research Questions

The first purpose of this study was to determine whether there are differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6). The second purpose was to determine to what extent the differences in the number of airmen who pass CDC courses among the AFSC category codes (1-6) are affected by whether the airmen have a secondary or higher AFSC category code. The third purpose of the study looked at what extent the differences is among the number of airmen who pass CDC courses among the AFSC category codes (1-6) were affected by whether the airmen have a CCAF degree. The study further examined whether there were differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA). The fifth purpose of the study was to determine whether the differences in the number of airmen among the PME areas of Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SNCOA) were affected by the attainment of a CCAF degree. The final purpose of the study was to determine whether there was a difference in the number

of airmen who passed CDC courses and the number of airmen who passed PME courses. Research questions were developed related to each purpose within the study.

Review of Methodology

This study utilized a causal-comparative research design to examine whether airman passed or failed CDC and PME courses. The population for this study included professional, enlisted military personnel with 1-30 years of experience. The target group consisted of active duty and traditional reserve members located at an Air National Guard base in the Midwest. Data were collected utilizing an Air Force computer program that provided information on PME and CDC course enrollment, completion, and pass/fail rates for each Airman located at an Air National Guard Base in the Midwest from 2005 to 2010. Quantitative data were analyzed utilizing χ^2 tests of equal percentages and a *z* test for two proportions for the six hypotheses in this study.

Major Findings

The results of this study indicated that airmen tended to pass AFSC category code 1, 2, and 3 tests more than would be expected by chance. This would demonstrate those who are completing AFSC category code 1, 2, and 3 tests are having higher levels of success with the covered content. When examining airmen with a secondary or higher AFSC category code (H2), airmen who had a secondary or higher AFSC category code tended to pass category 2 and category 3 tests more than is expected by chance. However, sample size issues caused expected values less than 5 in half of the six categories. Interpreting the results of this analysis is potentially compromised. Despite the sample size issues, the results of the tests were similar indicating having a secondary or higher specialty code did not affect the difference in the number of airmen who pass

CDC courses among the AFSC category codes (1-6). Thus, having a secondary or higher specialty code has no significant impact on AFSC category code course pass completion.

The results of the hypothesis testing related to what extent the differences among airmen who pass CDC courses among AFSC Category Code (1-6) were affected by whether the airmen have a CCAF degree (H3) indicated that airmen tended to pass category 2 and category 3 tests more than is expected by chance. However, sample size issues caused expected values less than 5 in four of the six Secondary or Higher AFSC category codes. Interpreting the results of this analysis is potentially compromised. Despite the sample size issues, the results indicated having a CCAF degree did not affect the results among AFSC category codes (1-6) demonstrating no significance regarding whether airmen did or did not have a CCAF when completing AFSC category code (1-6) tests.

The results of the analysis related to whether there was a difference in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA) indicated that airmen tended to pass ALS and SCNOA tests more than would be expected by chance. Those airmen completing ALS and SCNOA were found to be more successful in passing the tests resulting in a significant finding. The differences in the number of airmen who pass PME courses among the Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA) and whether the airmen course pass completion were affected by a CCAF degree were determined with results indicating that

having a CCAF degree had no significant impact. In this instance, the limited sample size could be a potential compromise to the accuracy of the result.

Finally, the results of the data analysis related to whether airman passed AFSC category code tests (1-6) with greater frequency than airmen who completed ALS, NCOA, and SNCOA PME courses. Airmen who completed AFSC category codes (1-6) were more successful in passing tests than those in ALS, NCOA, and SCNOA providing a significant result. This result could be related to the mandatory training nature of the AFSC category code course completion.

Findings Related to the Literature

This section examines this study's findings as they relate to the literature regarding outcomes for CDC and PME course completion for AF enlisted personnel. There were difficulties comparing the current study to past research as identified in chapter two. At the time of this study, there was no identifiable educational research on the pass/fail course completion of CDC and PME course completion for enlisted military personnel. The current study provided a step in filling the void for future research. Since no research exists in the literature concerning student outcomes from CDC and PME course pass/fail completion, the findings from the current study could not be compared to any other studies.

There have been studies conducted regarding the benefits of civilian education and airman success. These beneficial studies provide insight into the benefits of the CCAF degree program. Niemiec (1987) conducted a study that found Staff or Technical Sergeants who completed their CCAF early in their career had better quicker promotion opportunities than did their counterparts with similar skills and abilities without a CCAF

degree. Conversely, the results in the Niemiec (1987) study found those individuals who held the rank of Master Sergeant when awarded the CCAF degree did not achieve swifter promotion chances.

Although the results of Havron's (1998) study indicated CCAF participants and degree recipients had significantly higher levels of promotion, the results of this study indicated having a CCAF degree did not affect the course pass completion among AFSC category codes (1-6) or Airman Leadership School (ALS), Non-Commissioned Officer Academy (NCOA), and Senior Non-Commissioned Officer Academy (SCNOA). In addition, Lucchesi (2013) reported individual training could be improved when using the CCAF to achieve voluntary education goals as part of the required PME process.

Conclusions

The following includes the implications for actions section, which reviewed processes that need to be revamped, edited, or improved so that airmen find success with AF course completion. The recommendations for future research area will look at the benefits of examining PME and CDC course completion processes as well as discuss research related to the role of a CCAF degree. This section will finish with concluding remarks.

Implications for Action

The results of the current research study indicated that AFSC Category Codes (1-6) have groups of personnel with higher course pass completion. As stated in chapter one, there are specific guidelines that should be followed for an airman enrolled in AFSC specific CDC courses. By evaluating the training protocols supervisors/trainers are using, it could offer insight as to why there are pass rate differences among the AFSC

Category Code (1-6) groups. Determining if one category code of AFSC (for example Category Code 1) were given different processes, activities, or behaviors for learning CDC material than another AFSC (Category Code 2), would help determine if the shortfall between the category codes was linked to the training process received by airmen. By looking at the effective practices, supervisors and trainers can implement these concepts to increase future course pass completion for airmen.

In addition, based on the results of the study, trainers and supervisors could review training procedures for those completing CDCs in AF Category Codes (1-6) to see if the processes used by the airman during independent study time are different, what the airman used to achieve success, and the processes utilized to maintain motivation. The best practices for successfully completing the CDCs could be based on the actions and behaviors of the airman. In looking at what caused the individual airman to find success, there is a potential to assist other airman in reaching the same goals.

To become a Non-Commissioned Officer (NCO), an airman must pass ALS. In simple terms, to move from a Senior Airman (SrA) to a Staff Sergeant (SSgt), the required PME, ALS must be successful. Equally, for a Technical Sergeant (TSgt) to achieve the Master Sergeant stripe (MSgt), the airman must complete NCOA. Both of these promotions are significant for an airman's career. Forsyth and Muller (2011) further purported that the shortfall for the PME institution can be related to the inability to hire and retain quality faculty as well as the requirement to conduct research, data collection, and provide outcome assessment. It would be beneficial to evaluate the impact these PME deficits have on the effectiveness of PME.

Competent instruction can be the key to success for students. Murray (2014) reports the ability to successfully teach course material and have a comprehensible understanding of the information is essential to success. To accomplish these goals, PME needs to ensure 1) selecting the brightest and best for attendance at PME, 2) instructors who would be high-quality from civilian to military life, and 3) classroom instruction that would be more focused on improving critical thinking. These essential skills for PME instruction must become an integrated part of virtual PME for students to achieve success (Murray, 2014).

Recommendations for Future Research

There is limited research available on enlisted personnel CDC and PME course pass completion, but considerable studies have been done with officer professional development. This research study takes a first step in closing the gap between enlisted personnel course pass completion and officer studies. Walsh (1997) reported education costs, such as those associated with PME courses, cost a considerable amount of money. To control costs and improve course success for the Air Force, there are several recommendations for future research.

One future area of research could be an examination of protocols performed by supervisors for assisting airmen to complete AFSC Course Codes (1-6). This potential study would provide a basis for whether one category code of airmen is receiving better preparation for EOC completion than another category code. Supervisors becoming integrally involved in the material being learned by the airman could lead to the learning and understanding what creates success for airmen.

Finegold and Rogers (1985) conducted a study using AFOQT as a selection factor for weapons comptroller training, which found a significant relationship between the scores achieved on the AFOQT and successful completion of training. It is recommended future research look at the protocols in place for airman completing AFSC Course Codes (1-6). This research could provide information as to whether supervisors among the AFSC category codes are preparing airman in similar or different ways, which could lead to improvements in the AF enlisted training process.

As discussed in chapter one, Air Force Instruction 36-2301 (U. S. Department of the Air Force, 2010a) training for enlisted airmen should include Executive Education (EE), Professional Military Education (PME), and Career Development Courses (CDC) as well as undergraduate and graduate degrees attained through civilian or military higher education institutions. Research has demonstrated military personnel who achieve higher levels of education become more proficient, successful leaders. This results in having more success with their enlisted careers (Niemiec, 1987). Despite the current study not showing an impact on course pass completion by having a CCAF degree, due to the research conducted by Niemiec (1987), future research could be done to see what benefit the CCAF degree has on an enlisted member's success as a leader.

Another area of research to consider would be professional development for military personnel. PME should be focused on developing an individual as a leader (Fuller, 2013). The AF has created a correspondence program for PME that is voluntary to participate. If an individual has a desire to be promoted, they must ultimately complete the corresponding PME. Fuller (2013) stated, "Marines have institutionalized self-study and make it a part of the rating system for enlisted personnel" (p. 12). The AF,

on the other hand, expects the airman to complete the PME self-study program independently without supervisor guidance or input. It would be beneficial to evaluate the success of the monitored rating system of the Marine Corps in comparison to the AF process. A future area of research could be a comparison of the AF PME model to the Marine PME model to see if one of the models has higher course pass completion.

Fuller (2013) reported PME could be perceived as a check to mark for promotion purposes. One could speculate if the perception of personnel regarding PME processes in the AF is truly about promotion, rather than leader development. The current research showed that ALS and SNCOA course pass completion are greater than would be expected by chance. Keeping Fuller's (2013) statement in mind, the benefits of completing PME for promotion purposes could be the perception of personnel. To become a Non-Commissioned Officer (NCO), an airman must pass ALS. In simple terms, to move from a Senior Airman (SrA) to a Staff Sergeant (SSgt), the required level of PME (ALS) must be successfully completed. Equally, for a Technical Sergeant (TSgt) to achieve the Master Sergeant stripe (MSgt), the airman must complete NCOA. Both of these promotions are significant for an airman's career. Due to the course pass completion being higher for significant promotable areas, future research should focus on the perceptions of airmen for the purpose of improving PME completion.

In examining course pass completion of AFSC Category Codes (1-6) and ALS, NCOA, and SNCOA, the AFSC Category Codes showed higher course pass completion than expected. As stated above, due to the mandatory nature of AFSC Category Code, there could be a higher level of importance placed on CDC completion. Airmen must do on-the-job training, complete the required CDC for the respective AFSC, and go through

an evaluation process with the trainer and/or supervisor. ALS, NCOA, and SCNOA are voluntary, independent study programs. It is not mandatory for an airman to complete the respective PME course. There is no chance of future promotion without completing the required PME, but it may be that airmen are not concerned with future promotion and choose not to complete the required PME courses. Mahoney-Norris and Ackerman (2012) report the lack of concern in regards to PME is puzzling. Due to the current research study finding higher CDC course pass completion than PME course pass completion, it could be beneficial for future research to look at airmen perceptions of the priority between CDC and PME course completion.

Finally, the impact civilian education has on military enlisted personnel would be another area for consideration. Niemiec (1987) reports, "evaluation of CCAF curriculum effectiveness could benefit both the USAF and the CCAF students" (p. 1). While the results of this study found no statistically significant impact on AFSC category code as well as ALS, NCOA, and SNCOA course pass completion by having a CCAF degree, the influence of education on job performance and training prospects should still be an area for consideration. The AF AFSC Category Code courses may be refined to meet a specific career field focus and need. ALS, NCOA, and SCNOA programs could also be tied to specific goals the military wishes to see enhanced depending on the level the airman is trying to achieve. Therefore, the recommendation would be conducting a study comparing CCAF civilian course completion to each level of CDC and PME course completion to see if any of the five civilian courses required to complete the CCAF degree would have an impact on course pass completion to enhance AF training processes.

Concluding Remarks

Education and training are an integral part of enlisted military professional development. AFSC Category Code training should be reviewed for procedural processes to learn best practices for successful CDC course pass completion. It is essential for ALS, NCOA, and SCNOA course completion to be monitored and reviewed by supervisors regardless of the independent, voluntary nature of enrollment. In addition, research revealed Non-Air Force branches of the military have instituted specific guidelines regarding enlisted professional development that would be beneficial to enhance AF operations.

Finally, the impact of civilian education is an integral part of personal development. Research has identified the benefit of attaining additional civilian education. It is vital in looking at future research opportunities to explore the impact and benefit of acquiring higher levels of civilian education from the associates to graduate level. Further education could improve morale, create new opportunities for airman, and improve the overall quality of life for airmen. In conclusion, the future success of training and education for AF personnel depends on a willingness to alter the current status quo by implementing positive change to current training processes.

REFERENCES

Air Force Portal-Air Force Virtual Education Center (2010). *CCAF degree program and requirements.* Retrieved October 12, 2010 from https://www.my.af.mil/afvecprod/afvec/Pages/ViewContentItem.aspx?ID=39.

Alston, Y. (Ed.). (2008). Community College of the Air Force General Catalog 2008-2010. Retrieved October 12, 2010, from http://www.au.af.mil/au/barnes/ccaf/catalog/2008cat/2008_2010_General_catalog

Alston, Y. (Ed.). (2011). *Community College of the Air Force GENERAL CATALOG 2011-2013.* Maxwell-Gunter AFB, Alabama: United States Air Force.

Barnhill, J. T. (1991). *An assessment of the relationship between aptitude test scores and representation of Blacks and Hispanics in U.S. Navy occupations.* Retrieved April 1, 2015 from http://calhoun.nps.edu/bitstream/handle/10945/28005/assessmentofrela00barn.pdf?sequence=1

Bounds, G. L. (1985). *Military history and professional development: Suggestions to units and formations.* Fort Leavenworth, KS: U.S. Army Command and General Staff College.

Boyce, L. A., Wisecarver, M. M., & Zaccaro, A. J. (2005). *Understanding, predicting, and supporting leader self-development.* Retrieved October 21, 2010 from http://www/hqda.army.mil/ari/pdf/TR1173text.pdf

Brookfield, S. (1995). Adult learning: An Overview. *International Encyclopedia of Education.* Retrieved 11-25-2014 from http://nlu/edu/ace/Resources/Documents/AdultLearning.html

Brown, K. B., & Syme-Taylor, V. (2012) Women academics and feminism in professional military education. *Equality, Diversity and Inclusio*n: *An International Journal*, *31*(5/6), pp.452 – 466. Retrieved from www.emraldinsight.com/2040-7149.htm on 01-15-2015

Browne, J. S. (2003). *Air Force leadership development transformation's constant.* Retrieved 10-21-2010 from http://firstsearch.ocle.org/WebZFSFETCH?fetchtype=fullrecord:sessionid=fsapp4-4342

Department of Defense (2007). *Directive 1322.08E: Voluntary education programs for military personnel.* Retrieved October 21, 2010 from http://www.dtic.mil/whs/directives/corres/pdf/132208p.pd

Department of Defense (2009). *Directive1322.18*: *Military Training* . Retrieved October 12, 2010 from http://www.dtic.mil/whs/directives/corres/pdf/132218p.pdf

Department of Defense (1997). *Instruction 1322.25*: *Voluntary education programs.* Retrieved December 21, 2014 from http://www.dtic.mil/whs/directives/corres/pdf/132225p.pdf

Dike, S. E. (2001). Air Force professional military education: Faculty perceptions of critical thinking. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses Database. (UMI No. 3028893).

Duncan, R. E. (1994). *An approach for equalizing test scores or skt-exempt AFSCs.* Retrieved April 1, 2015 from http://www.dtic.mil/dtic/tr/fulltext/u2/a284677.pdf

Filiz, C., & Jean-Pierre, M. (2012). *An analysis of personal and professional development in the United States Navy.* Monterey, CA: Naval Postgraduate School. Retrieved September 29, 2014 from http://calhoun.nps.edu/handle/10945/6793?show=full\

Finegold, L., & Rogers, D. (1985). Relationship between Air Force officer qualifying test scores and success in air weapons controller training. *Air Force Human Resources Lab, 85*(13), 2-21. Retrieved March 9, 2015 from http://www.dtic.mil/dtic/tr/fulltext/u2/a158162.pdf

Forsyth Jr., J. W., & Muller, R. R. (2011). We were deans once…and young. *Air & Space Power Journal*, *25*(3), 91-99.

Fuller, C. (2013). Squadron Officer School and Professional Military Education Checking Boxes or Building Leaders? Retrieved June 1, 2015, from http://www.afjag.af.mil/shared/media/document/AFD-131219-083.pdf

Geraghty, J. (2010). *The nature and nurture of military genius: Developing senior strategic leaders for the postmodern military.* Maxwell AFB, AL: Air University.

Hardison, C. M., Sims, C. S. & Wong, E. C. (2010). *The AIR FORCE officer qualifying test validity fairness bias.* Retrieved April 1, 2015 from http://www.rand.org/content/dam/rand/pubs/technical_reports/2010/RAND_TR744.pdf

Havron, S. L. (1998). *Pilot investigation of participation levels in the community college of the Air Force and promotion to senior master sergeant.* Retrieved January 21, 2015 from http://search.proquest.com.bakeru.idm.oclc.org/pqdthss/docview/304448947/357F948D22DA4420PQ/1?accountid=26368

Intrator, S. M., & Kunzman, R. K. (2007) Starting with the soul. How can we nurture teachers for the long haul? Stop putting subsistence strategies ahead of deeper needs. In F. Schulz (Ed.) *Education* (pp. 190-193). Dubuque, IA: McGraw-Hill.

Kenney, S. H. (1996). Professional military education and the emerging revolution in military affairs. *Airpower Journal*. Retrieved September 2, 2015 from http://www.airpower.maxwell.af.mil/airchronicles/apj/apj96/fall96/kenney.pdf

Kimminau, J. A. (2004). One Challenge of Force Development: Development education and PME. *Air & Space Power Journal*. Retrieved October 21, 2010 from http://www.airpower.au.af.mil/airchronicles/cc/kimminau.html

Larsson, G., Bartone, P., Bos-Bakx, M., Danielsson, E., Jelusic, L., Johansson, E., & Moelker, R. (2006). Leader Development in Natural Context: A Grounded Theory Approach to Discovering How Military Leaders Grow. *Military Psychology, 18*, 69-81. Retrieved December 23, 2011, from http://ehis.ebscohost.com/eds.pdfviewer/pdfviewer?vid=11&hid=4&sid=d9cdce77-3a98

Leonard, H. A., Winkler, J. D., Hove, A., Ettedgui, E., Shanley, M. G., & Sollinger, J. (2001). *Enhancing stability and professional development using distance learning.* Santa Monica, CA*:* RAND.

Levy, D. G. (2001). *Strategic and Performance planning for the office of the chancellor for education and professional development in the Department of Defense.* Retrieved October 21, 2010 from http://www.rand.org/publications/MR/MR1234/

Lewis, C. (2006). *Army officer professional military education system reform to produce leader competency for the future*. Retrieved October 21, 2010, from https://www.google.com/#q=army officer professional military education system reform to produce leader competency for the future

Lucchesi, M. D. (2013). *Air force senior enlisted leadership development: A strategic level examination.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Thesis database. (UMI No. 3567588).

Murray, N. (2014). The Role of Professional Military Education in Mission Command. *JFQ: Joint Force Quarterly*, (72), 10.

Niemiec, G. (1987). The effect of community college of the air force participation on enlisted promotions in selected career fields. Retrieved June 15, 2015, from https://www.researchgate.net/publication/235058498_The_Effect_of_Community_College_of_the_Air_Force_Participation_on_Enlisted_Promotions_in_Selected_Career_Fields

Paschal, D. G. (2006). *Irregular Warfare: Impact on future professional military education*. Carlisle Barracks, PA: U.S. Army War College.

Picano, J. J., Roland, R. R., Williams, T. J. & Rollins, K. D. (2006). Sentence Completion Test Verbal Defensiveness as a Predictor of Success in Military Personnel Selection. *Military Psychology 18*(3), 207-218.

O'Brien, R. (2012). Air Officer's Education. *Air & Space Power Journal*, *26*(4), 129-148. Retrieved January 21, 2015 from http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.dtic.mil%2Fcgi-bin%2FGetTRDoc%3FAD%3DADA565059&ei=grgLVc6aO4i-ggSNrIKABA&usg=AFQjCNGfoOnexISykiciHa6K_Bci_iJ3cw&bvm=bv.88528373,d.eXY

Russell, S. S. (2006). *An overview of adult learning processes.* Retrieved January 21, 2015 from http://www.medscape.com/viewarticle/547417_print

Schenker, J. D., & Rumrill, P. D., Jr. (2004). *Perspectives on scientific inquiry causal-comparative research designs.* Retrieved December 23, 2011 from http://ehis.ebscohost.com/eds/pdfviewer/pdfviewer?vid=2&hid=4&sid=d9cdce77-3a98-4

Sibul, E. A. (2011). Military history, social sciences, and professional military education. *Baltic Security and Defence Review,* 13(1). Retrieved December 23, 2011 from http://ehis.ebscohost.com/eds/pdfviewer?sid=d9cdce77-3a98-45c2-af55-45775

Smith, M. A. (2009). *Evaluation of the leadership professional development program in the U.S. army's education system* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Thesis database. (UMI No. 05176792).

Tan, M. (2010). Right airman in right job. *Air Force Times,* 30(pgs. 30-31).

Thurber, J. (2003). *Adult learning styles.* Retrieved December 23, 2011 from https://www.npma.oeg/Archives/15-1-Thurber.pdf

United States Department of the Air Force (1993). *Education/Training. Instructional systems development* (AFMAN 36-2234). Retrieved 12-20-2011 from https://www.my.af.mil/gcss-af/USAF/search?text=AFM+36-2234

United States Department of the Air Force (2000). *Personnel. Air Force mentoring* (AFI 36-3401). *Air Force Mentoring.* Retrieved October 18, 2010 from http://www.af.mil/shared/media/epubs/AFI36-3401.pdf

United States Department of the Air Force. (2001a). *Personnel. Technical and basic military training development* (AETCI 36-2203). Retrieved October 21, 2014 from http://static.e-publishing.af.mil/production/1/aetc/publication/aetci36-2203/aetci36-2203.pdf

United States Department of the Air Force (2001b). *Professional development (advanced academic degrees and professional continuing education* (AFI 36-2302). Retrieved October 21, 2010 from http://static.e-publishing.af.mil/production/1/af_a1/publication/afi36-2302/afi36-2302.pdf

United States Department of the Air Force (2002a). *Personnel. Employee training and development* (AFI 36-401). Retrieved October 11, 2010 from http://www.af.mil/shared/media/epubs/AFI36-401.pdf

United States Department of the Air Force. (2002b). *Personnel: Information for designers of instructional systems. Test and measurement handbook (*AFH 36-2235 V.12). Retrieved December 20, 2011 from http://www.au.af.mil/au/awc/awcgate/edref/afh36-2235v11.pdf

United States Department of the Air Force. (2004). *Development and maintenance of interactive multimedia instruction (AETCI 36-2209).* Retrieved October 11, 2010 from http://www.au.af.mil/au/awc/awcgate/edref/aetci36-2209.pdf

United States Department of the Air Force. (2008). *On learning; the future of Air Force education and training* (AETC). Retrieved October 11, 2010 from http://www.au.af.mil/au/awc/awcgate/aetc/afd-080130-066.pdf

United States Department of the Air Force (2010a). *Personnel. Developmental education* (AFI 36-2301). Retrieved October 21, 2010 from http://www.au.af.mil/au/awc/awcgate/edref/afi36-2301.pdf

United States Department of the Air Force. (2010b). *Personnel. Technical and basic military training administration (*AETCI 36-2215). Retrieved October 21, 2014 from http://static.e-publishing.af.mil/production/1/aetc/publication/aetci36-2215/aetci36-2215_.pdf

United States Department of the Air Force. (2010c). *Air Force training program* (AFI 36-2201). Retrieved October 11, 2010 from http://static.e-publishing.af.mil/production/1/af_a1/publication/afi36-2201/afi36-2201.pdf

United States Department of the Air Force (2011). *Total force development* (AFPD 36-26). Retrieved February 22, 2014 from http://www.ang.af.mil/shared/media/document/AFD-111108-003.pdf

United States Government Accountability Office (2004). *Military education DOD needs to develop performance goals and metrics for advanced distributed learning in professional military education.* Retrieved January 12, 2015 from http://www.gpo.gov/fdsys/pkg/GAOREPORTS-GAO-04-873/html/GAOREPORTS-GAO-04-873.htm

Walsh, D. (1997). Joint Professional Military Education and its effects on the Unrestricted Line Naval officer career. Retrieved June 1, 2015, from https://archive.org/stream/jointprofessiona00wals#page/n5/mode/2up

Weston, D. (2010). *Study of student perceived effectiveness of the delivery of distance education instruction at the United States Army command and general staff college.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Thesis database. (UMI No. 3408158)

Wielsma, R. (1996). An analysis of factors affecting promotion, retention, and performance for USMC officers: A graduate education perspective. Retrieved June 1, 2015 from http://hdl.handle.net/10945/32209.

Williams, T. R. (2010). *Culture-we need some of that: cultural knowledge and Army officer professional development.* Retrieved October 21, 2010 from http://handle.dtic.mil/100.2/ADA448821.

Wilson, K. J. (2006). *Transformation of the noncommissioned officer education system: leveraging education to improve noncommissioned officer professional development.* Retrieved October 21, 2010 from http://handle.dtic.mil/100.2/ADA449413

Zacharias, J., & Van Der Werff, J.A. (2012). *The future of adult education in the military.* Retrieved January 21, 2015 from http://onlinelibrary.wiley.com/doi/10.1002/ace.20038/pdf

APPENDICES

APPENDIX A: AIR FORCE SPECIALTY CODES

Table A1

Career Development Course Categories (1)

Category	Course Title	Description
(1A)	Aircrew Operations	This course covers enlisted aircrew AFSCs, military command structures, aircrew training, and standardization including flight operations and authorizations.
(1C)	Command Control Systems Operations	The course overviews the functions involved in aerospace surveillance, vehicle detection, missile warning systems, controlling, and plotting (Powers, 2014).
(1N)	Intelligence	This Category is Classified. No Description can be provided for this area of courses.
(1S)	Safety	In this category, the focus is on planning, organizing, and directing safety activities.
(1W)	Weather	The course provides an overview of meteorology, weather operations, and radar functions (Powers, 2014).

Table A2

Career Development Course Categories (2)

Category	Course Type	Description
(2A)	Manned Aerospace Maintenance	Installing, maintaining, removing, and repairing aerospace equipment used with aircraft and weaponry (Powers, 2014).
(2E)	Communications Systems	An overview of electromagnetic principles covering radar, digital systems, deployable systems, and general aircraft control principles are covered in this course (Powers, 2014).
(2F)	Fuels	This course explains the maintenance, operations, and preparation for fuel equipment and products (Powers, 2014).
(2G)	Logistics Plans	The course encompasses monitoring, formulating, developing, and evaluating logistics plan systems (Powers, 2014).
(2M)	Missile and Space Systems Maintenance	An overview of techniques and skills necessary to operate, test, and troubleshoot missile, booster, and satellite functions (Powers, 2014).
(2P)	Precision Measurement Equipment Laboratory	This provides the overview necessary to repair, calibrate, and certify diagnostic equipment (Powers, 2014).
(2R)	Maintenance Management	The course examines planning, scheduling, and operating management information systems, aircraft, and missile equipment (Powers, 2014).
(2S)	Material Management	Functions of this course include managing supply systems, including warehouses, equipment and records (Powers, 2014).
(2T)	Transportation and Vehicle Management	Operational features of this program involve transportation for moving personnel, material, and household goods (Powers, 2014).
(2W)	Munitions and Weapons	This course looks at assembling and maintaining nonnuclear and nuclear munitions including inventory, storing, and delivery processes (Powers, 2014).

Table A3

Career Development Course Categories (3)

(3C)	Communications-Computer Systems	An overview of information technology, bandwidth, system spectrums and computer operation procedures are examined in this course.
(3E)	Civil Engineering	Personnel enrolled in these courses overview mechanical, electrical, structural, pavement, fire protection, explosive ordinance processes, and emergency management procedures (Powers, 2014).
(3M)	Services	Airmen in this course study food facilities, long and short term lodging, mortuary affairs and search and recovery teams (Powers, 2014).
(3N)	Public Affairs	This course reviews the complete human communication activity and function for facilitating information between the Air Force and the general public (Powers, 2014).
(3P)	Security Forces	In this course, airmen learn protection duties, combat capabilities, and how to handle hostile or sensitive environments (Powers, 2014).
(3S)	Mission Support	Personnel functions and activities involving equal opportunity, education and training, and personnel management are examined in this series of courses (Powers, 2014).
(3V)	Visual Information	The course examines the use of photo processing functions, graphic art, sound production, and visual presentations (Powers, 2014).

Table A4

Career Development Course Categories (4)

(4)	Medical	These courses examines operating fixed and field medical facilities, caring for and treating personnel as well as encompassing all areas of the medical profession (Powers, 2014)
(4Y)	Dental	Courses in this field cover dental

Table A5

Career Development Course Categories (5)

(5J)	Paralegal	The processes in this course cover military justice, wills, power of attorney processes, and legal administrative activities (Powers, 2014).
(5R)	Chaplain Assistant	Airmen in this area provide spiritual and/or ministry support to personnel and families (Powers, 2014).

Table A6

Career Development Course Categories (6)

(6F)	Finance	This course provides an overview for formulating, executing, and analyzing appropriation and expense, real property of Air Force financial operations (Powers, 2014).

APPENDIX B: PROFESSIONAL MILITARY EDUCATION CATEGORIES

Table B1

Professional Military Education Categories

Category	Course Type	Description
Course 1 (00001)	Airman Leadership School (ALS)	ALS is a voluntary, paper-based course designed to provide knowledge, concepts, principles, and information to be successful supervisors in the military environment.
Course 9 (00009)	Non-Commissioned Officer Academy (NCOA)	This course provides a basic understanding of writing, speaking, and communication skills as well as Human Resource objectives to create professionalism in the NCO ranks.
Course 14 (00014)	Senior Non-Commissioned Officer Academy (SNCOA)	SNCOA provides knowledge in Human Resource Development, Behavior Analysis, Communication Skills, Professional of Arms, and Organizational Management.

APPENDIX C: AUTHORIZATION FOR STUDY

Walker, Caran J Civ USAF AFGSC 509 FSS/FSDE

From: Brosi, Norman R Col USAF ANG 139MSG/CC [Norman.Brosi@ang.af.mil]
Sent: Monday, October 24, 2011 2:32 PM
To: Walker, Caran J Civ USAF AFGSC 509 FSS/FSDE
Subject: RE: Hello
Signed By: norman.brosi@ang.af.mil

Caran,

This is to confirm that I gave you permission to accomplish your research in comparing AFSCs and PME test scores. Best wishes in all of your endeavors.

NORMAN R. BROSI, Col, MOANG
Commander, 139AW Mission Support Group
705 Memorial Drive
St Joseph, MO 64503
816-236-3278, DSN 356-3278, FAX 3378

-----Original Message-----
From: Walker, Caran J Civ USAF AFGSC 509 FSS/FSDE
[mailto:caran.walker@whiteman.af.mil]
Sent: Monday, October 24, 2011 10:17 AM
To: Brosi, Norman R Col USAF ANG 139MSG/CC
Subject: Hello

Good Day Sir,

I hope this finds you doing well. Hope everything is settling back down from the near flooding. I spoke to you several months ago about writing my dissertation on the AFSC test scores to see if we could determine an area that had was more successful than others. You told me that it sounded good. Recently my advisor told me that I needed to have something in writing (email counts) stating that you approved my doing the comparison for the AFSCs and PME test scores and the Rank (years of service). Would you mind confirming via email that you gave me permission? It is for the IRB approval process. I appreciate your help.

Thank you.

V/R,

Caran J. Walker

Education Services Specialist

Professional Development Center

APPENDIX D: IRB APPROVAL

BAKER UNIVERSITY

Date: 25 Aug 2014

SCHOOL OF EDUCATION
GRADUATE DEPARTMENT

IRB PROTOCOL NUMBER _____
(IRB USE ONLY)

IRB REQUEST
Proposal for Research
Submitted to the Baker University Institutional Review Board

I. Research Investigator(s) (Students must list faculty sponsor first)

Department(s) **School of Education Graduate Department**

	Name	Signature	
1.	Susan Rogers	Susan K Rogers	Major Advisor
2.	Margaret Waterman	Margaret Waterman	Research Analyst
3.	Harold Frye		University Committee Member
4.	Rob Little		External Committee Member

Principal Investigator: Caran Walker _____
Phone: 816-508-9561
Email: kccounselor@gmail.com
Mailing address: 1613 SE 5th Terr., Lee's Summit, MO 64063

Faculty sponsor: Susan Rogers
Phone: 913-344-1226 (office) 785-230-2801 (cell)
Email: srogers@bakeru.edu

Expected Category of Review: _X_Exempt ___ Expedited _ __Full

II: Protocol: (Type the title of your study)

Differences in Test Pass Course Completion in the United States Air Force Professional Development Program

_____

Summary

In a sentence or two, please describe the background and purpose of the research.

The purpose of this study will be to examine if there are identifiable differences in completion rates for Air Force Specialty Code Career Development Courses (CDC). A further purpose will be to examine which CDC and Professional Military Education (PME) content areas have the highest course pass completion among Airmen. A third purpose will explore whether the rank of military members had an impact on differences in course pass completion. An additional purpose will be to determine whether the number of Air Force Specialty Codes (AFSCs) members are trained in affected course pass completion. Finally, the researcher will examine whether a Community College of the Air Force (CCAF) degree had an impact on the likelihood of a student passing subsequent CDC exams.

Briefly describe each condition or manipulation to be included within the study.

There will be no conditions or manipulations conducted during the course of this study.

What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.

There will be no questionnaires or other instruments utilized in this study.

Will the subjects encounter the risk of psychological, social, physical or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.

There will be no risk associated with this study. The data will be taken from a sensitive military database that showed the EOC exams for military personnel. Personnel remained anonymous during the course of this study and would only be identified by Air Force Specialty Code in the final study data.

Will any stress to subjects be involved? If so, please describe.

There will be no stress for any subjects involved with this study. All data is archival.

Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.

The subjects will not be not misled, nor deceived in any way during this study.

Will there be a request for information, which subjects might consider to be personal or sensitive? If so, please include a description.

There will be no requested information about the subject that would be considered personal or sensitive in this study.

Will the subjects be presented with materials, which might be considered to be offensive, threatening, or degrading? If so, please describe.

There will be no materials presented to subjects that could be considered offensive or threatening.

Approximately how much time will be demanded of each subject?

This data will be taken after the personnel have taken their End Of Course (EOC) exam. There was no impact on their time for this study.

Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information, which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.

This study will include all active duty and traditional military personnel enrolled in courses who were stationed at an Air National Guard Base in the Midwest from 2005-2010. No subjects will be solicited or contacted as the data is archival.

What steps will be taken to insure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?

There will be no impact on the individuals. The Mission Support Group Commander approved the study. There will be no need for voluntary participation from personnel; individuals will remain anonymous during the course of the study. Approval for this study was granted by the Mission Support Group Commander.

How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.

This will be an anonymous, after-the-fact study, which will not impact the participants which made it unnecessary to gain consent.

Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.

This study will have no impact on the permanent record of any individual whose data was utilized.

Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher or employer? If so, explain.

The fact that a subject did or did not participate in the study will have no relevance on the study.

What steps will be taken to insure the confidentiality of the data? Where will it be stored? How long will it be stored? What will be done with it after the study is completed?

Steps will be taken to maintain the confidentiality of all data. The data will be stored in a secure cabinet until the study is complete. After the dissertation and defense is completed, the data will be destroyed.

If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?

There will be no risk involved to anyone involved with the study.

Will any data from files or archival data be used? If so, please describe.

All data used for this study will be archival.

APPENDIX E: IRB APPROVAL

Baker University Institutional Review Board

September 24, 2014

Dear Caran Walker and Dr. Rogers,

The Baker University IRB has reviewed your research project application and approved this project under Exempt Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.

Please inform this Committee or myself when this project is terminated or completed. As noted above, you must also provide IRB with an annual status report and receive approval for maintaining your status. If you have any questions, please contact me at CTodden@BakerU.edu or 785.594.8440.

Sincerely,

Chris Todden EdD
Chair, Baker University IRB

Baker University IRB Committee
Verneda Edwards EdD
Sara Crump PhD
Molly Anderson
Scott Crenshaw