ENTRY LEVEL TRAINING FOR COMBAT COMMUNICATIONS PERSONNEL

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DEDICATION

I dedicate this thesis to my wife and children. Without their patience, understanding, support, and most of all, love, the completion of this work would not have been possible.

ACKNOWLEDGMENTS

I wish to thank my instructor, Professor McConnell, for his guidance and mentorship as I worked through the details of this research. Thank you also to the men and women of the active duty combat communications community for your participation, input, and perspective. With your help, we can improve training for those who follow after you.

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ABSTRACT OF THE THESIS

ENTRY LEVEL TRAINING FOR COMBAT COMMUNICATIONS PERSONNEL

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This research explores the effectiveness of the entry-level information technology (IT) technical training methodology currently employed by the United States Air Force (USAF). The USAF training model includes a mixture of best practices recommended by the IT industry, including professional certification, technical and non-technical skills development, and the encouragement of undergraduate and graduate level learning. However, new accessions into combat communications (telecommunications) units seem unprepared to meet the demands of today's workplace. Through survey of these new employees and their supervisors, this study

explores whether or not the USAF combat communications training model is effectively preparing new employees to operate in the cyberspace domain.

The scope of this study is limited to the USAF's five active duty combat communications units. However, the results gathered have implications for the greater USAF's information technology and cyberspace training models, and could impact how the organization chooses to train and employ entry-level telecommunications and cyberspace professionals.

USAF cyberspace professionals are trained in part using guidelines and recommended best practices taken from both industry and government. Therefore, the results of this study will either reinforce or contradict current opinions from the field regarding the best way to train and educate new information technology and telecommunications specialists.

Keywords: 3DXXX, 8570, career field education and training plan (CFETP), combat communications, cyberspace, information technology certification, information technology undergraduate studies, information technology training, on-the-job training (OJT), telecommunications, vendor training, United States Air Force (USAF).

Introduction

The United States Air Force (USAF) relies heavily on its combat communications forces to provide initial entry command and control capabilities, via tactical data networks, anywhere around the globe. These units maintain the ability to mobilize and deploy within 72 hours of notification, and are often thrust into austere and hostile operating environments within striking rage of the enemy. As such, combat communications units are charged with maintaining an "always ready" posture during peacetime, to effectively execute their communications missions swiftly and succinctly during wartime.

As threats in cyberspace grow at an unprecedented rate, the United States Department of Defense (DoD) has invested enormous amounts of time, money, people, and resources into its data networks (Office Of The Under Secretary Of Defense (Comptroller) Chief Financial Manager, 2017, chap 2). As a component of the DoD, the USAF has done its part to ensure that its enterprise network, the AFNET, is monitored and defended by cyberspace professionals and cutting-edge technologies 24 hours a day, 365 days a year (Air Force Space Command, 2017, p. 1). However, the knowledge proficiency and defensive posture of the USAF's combat communications units, which deploy to the forward edge of the battle area and operate on networks separate from the AFNET, have stagnated in the last decade. The likely culprit for this decline is the Air Force's intense focus on offensive and defensive cyberspace operations, specialties seen by many as disjoint from the telecommunications service provider role that combat communications units are often asked to fulfill.

Evidence of this schism became alarmingly apparent in 2013, when the USAF cut its inventory of active duty combat communications capability by 50 percent. That year, 4 units were shut down, the largest of which was a Group-sized element of over 750 personnel (United

States Air Force, 2013, p. 1). Today, the combat communications total force community includes 5 Active Duty Air Force squadrons, 3 Air Force Reserve squadrons, and 15 Air National Guard Squadrons. As the USAF prepares to engage in new and emerging conflicts around the world, its senior leaders now realize that the 2013 cuts into their combat communications capabilities were too deep. It is now a race against time to effectively train, modernize, and bolster the combat communications force before sending it back out into the world to help fight America's wars.

Problem Statement

Combat communications units are ultimately responsible for training their personnel, maintaining and operating their equipment, and remaining always ready to provide expeditionary tactical communications when called upon. This paper addresses the problem of whether or not the combined training efforts of the USAF and its associated combat communications units are enough to effectively maintain the technical competencies, technological edge, and operational rigor required to adequately prepare new employees to operate in the cyberspace domain.

Purpose

The intent of this research is to explore whether or not meaningful training shortfalls exist in the combat communications community, which may ultimately leave a unit and its supported customers significantly vulnerable to enemy actions in cyberspace. The results of this research should reinforce the efficacy of the current training model practiced by the combat communications community, or should signal a need for change to better equip the community with the training resources it requires to conduct advanced cyberspace operations in the 21st century operating environment.

Research Questions

This study measures the effectiveness of the combat communications community's IT training methodology, which is built on many government standards and industry best practices. Specifically, the study intends to prove or disprove the following seven hypotheses:

H1. USAF technical school training does not equip students with the right tools to succeed in a combat communications unit.

H2. USAF-mandated 8570 training does not equip students with the right tools to succeed in a combat communications unit.

H3. Formal academic education does not equip students with the right tools to succeed in a combat communications unit.

H4. Unit provided on-the-job training does not equip students with the right tools to succeed in a combat communications unit.

H5. Vendor supplied training does not equip students with the right tools to succeed in a combat communications unit.

H6. Unit provided unit type code training does not equip students with the right tools to succeed in a combat communications unit.

H7. The 2009 3DXXX career field merger did not negatively affect the quality of unit provided combat communications training.

Significance of Study

At any moment, combat communications units may be tasked with supporting American or allied forces deploying in harm's way. As such, it is imperative that the IT services provided

by these units help keep friendly forces one step ahead of the enemy at all times. To do so, the USAF must ensure that it continually trains, equips, secures, manages, and evolves its combat communications IT enterprise. With these things in mind, this study assesses the current state of training in the combat communications community. Any finding that indicates a divergence from USAF-envisioned technician training proficiency should be quickly remedied, as such a departure may pose significant risk to downrange mission assurance.

The scope of this study is limited to the USAF's five active duty combat communications units. However, the results gathered herein have implications for the greater USAF's information technology and cyberspace training models, and how the organization chooses to employ entry-level telecommunications and cyberspace professionals. USAF cyberspace professionals are trained in part using guidelines and recommended best practices taken from both industry and government. Therefore, the results of this study will also reinforce or contradict current opinions from the field regarding the best way to train and educate new information technology and telecommunications specialists.

Definition of Terms

Command and control. According to the United States Marine Corps, command and control is, "the means by which a commander recognizes what needs to be done and sees to it that appropriate actions are taken." (1996, p. 37). Combat communications units often enable command and control by providing tactical data links to the commander, which connect him or her to higher, adjacent, and subordinate units.

Abilities. Competence in performance that leads to an observable product.

Combat communications. Combat communications is a term used by the USAF to describe its inventory of rapidly deployable, expeditionary, tactical communications forces. These forces “extend the network” and provide tactical communications to remote locations (Weggeman, 2017, p. 7).

Combat communications total force. The combat communications total force is the representative body of combat communications units spanning across the active duty, guard, and reserve.

Cyberspace operations. According to the Joint Chiefs of Staff, cyberspace operations are, “the employment of cyberspace capabilities where the primary purpose is to achieve objectives in or through cyberspace.” (2013, p. V).

Knowledge. An understanding of information as it applies to job performance.

Mission assurance. According to the USAF’s Lemay Center for Doctrine, mission assurance is the sum total of the, “measures required to accomplish essential objectives of missions in a contested environment.” (2011, p. 9). Cyberspace operations create mission assurance by ensuring the tenants of the CIA triangle (confidentiality, integrity, and availability) exist unadulterated for all missions that rely on Air Force or DoD networks.

Skills. The application of the appropriate tools to accomplish a task.

Literature Review

Since the dawn of information technology, the industry has struggled to identify the key skills it requires of its entry-level practitioners. Discussions dating back more than fifty years debate how to best train personnel, how to maintain key competencies over time, and how to keep curricula relevant in a technological environment that undergoes constant change. The breadth of these conversations span across academia, industry, professional organizations, and

government.

Academia vs Industry

A brief history. A swath of research exists which details differences (and perceived differences) between institutions of higher learning and the information technology industries that they support. In 2000, researcher Harvey Matkin conducted a Delphi study that determined whether or not a significant difference in perspective exists between industry and academia concerning various elements of information technology curricula. Using the *IS '97 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems* as his primary research focus, Matkin concluded that there were significant differences in the perception between industry and academia for their information technology educational needs (Matkin, 2000, p. 127).

Citing Ashenhurst (Ashenhurst, 1972), Matkin identified that industry and academia have made multiple collaborative attempts since 1972 to adopt a curriculum that satisfies industry requirements while simultaneously aligning with academic goals (as cited in Matkin, 2000, p. 1). To reinforce this trend across the decades, Matkin then presented Thomas' viewpoint (Thomas, 1990) that as early as 1990, researchers had observed a growing schism between what colleges were teaching to students and what skills entry-level workers in the field required on their first day on the job (as cited in Matkin, 2000, p. 1).

In 1992, the *Journal of Computer Information Systems* published an article (Gambill & Jackson, 1992) criticizing universities for failing to equip information technology professionals with the business skills required in industry's workplaces (as cited in Matkin, 2000, p. 39). In 1993, tech giant IBM further criticized information technology higher education programs (Seymour, 1993) for not growing employees who were able to have an immediate impact on

business operations (as cited in Matkin, 2000, p. 10). That same year, a study by Arnett and Litecky noted that while businesses were in search of graduates with highly specific information technology skills, schools were teaching generalized curricula which enforced more conceptual ideas (Arnett & Litecky, 1993); their research concluded that the educational system needed to learn to dynamically adjust their curricula to the needs of industry (as cited in Matkin, 2000, p. 33).

In 1993, Nontz first identified industry's growing expectation for entry-level information technology specialists to possess various "soft skills" (Nontz, 1993) – such as the ability to communicate and to display a strong foundation in ethics – in addition to their technological abilities (as cited in Matkin, 2000, p. 36).

In 1997, the *Information Technology Association of America* (Information Technology Association of America, 1997) published an article that identified workplace "employers' inability to find enough employees skilled in information technology needed to grow, expand, and compete," (as cited in Matkin, 2000, p. 10).

In 1998, the *Information Technology Association of America* published a study by the Virginia Polytechnic Institute and State University (Information Technology Association of America, 1998), which identified educational requirements for computer scientists and engineers, systems analysts, and programmers. The study found that most companies in industry required professionals in these three areas to have at least a bachelor's degree, and that "the two major sources of training for IT workers were in-house training departments and hardware/software vendors," (as cited in Matkin, 2000, p. 48).

An in-depth study published by the *Journal of Information Systems Education* in 2009 compared the relative perceived value of entry-level information technology skillsets between

academia and managers in industry. Referencing studies by Abraham et al (2006) and Fang, Lee and Koh (2005), the article explained how core information systems and information technology skillsets were desirable for new hires, but that most of these positions would be hired outside of the United States. However, information technology employees who also possessed business and operations knowledge upon graduating college were far more likely to secure entry-level positions within the United States (as cited by Aasheim, Li and Williams, 2009, p. 350).

The study found that the most important skills for new hires in the field of information technology, as perceived by both industry and academia were:

1. Interpersonal skills/traits
2. Personal skills/traits
3. Technical skills
4. Organizational and managerial knowledge/skills
5. Experience and GPA

However, the study found that information technology managers placed more value (in descending order) on the following traits than academia (Aasheim, Li and Williams, 2009, p. 353-354):

1. Hardware concepts
2. Operating systems
3. Leadership skills
4. Entrepreneurial/risk taking
5. High overall college GPA
6. Package software
7. Any prior work experience

The study suggests that academia should focus on “both ends of the technical/non-technical spectrum,” (Aasheim, Li and Williams, 2009, p. 354). Another important result of this study was the recommendation that information technology managers should invest in additional training for new hires for company-specific software, hardware, and operating systems, as well as follow-on training in “soft skills” such as leadership and entrepreneurialism (Aasheim, Li and Williams, 2009, p. 354).

In 2010, the *Association for Computing Machinery* published an article that further refined Nontz’s earlier observation that industry now expected far more from entry-level information technology specialists than just a firm grasp on technical skills. Citing data from the US Department of Labor and other sources, the article warned that while the demand for college graduates in fields such as systems administrator, database administrator, and computer software engineer was on the rise, annual graduation rates for these types of programs were seeing a nationwide decline (Benamati, Ozdemir, & Smith, 2010, p. 1). The article went on to further reinforce the previously-identified growing trend in the United States to outsource entry-level programming and other technical jobs to overseas organizations, consequently forcing recent college graduates with degrees in information technology to focus more on management and operations than on their technical skillsets (Benamati, Ozdemir, & Smith, 2010, p. 1). The takeaway for the reader is that a delicate balance between technical proficiency, project management, and managerial skills is required for success in the 21st century American workplace.

In a longitudinal study published in 2012, the *Journal of Information Systems Education* identified how recent advances in information technology are further defining what skills are important for entry-level employees to master prior to entering the workforce. These skills

included an understanding of virtualization, computer security, mass storage, interoperability and integration, and advances in web-facing interfaces (Aasheim et al, 2012, p. 194). In 2012, the national level of interest in information technology degrees began to swing back toward normal, bringing an uptick of needed information technology college graduates back into the workforce. Although technology had changed, the study found that organizations still sought new employees with both technical and non-technical skills, ranging from proficiency in operating systems and security to a commitment to honesty and integrity (Aasheim et al, 2012, p. 199). Interestingly, the study found that "management positions only mentioned certifications in 7.7% of the cases," (Aasheim et al, 2012, p. 195).

Training and Certifications

Having established a conversation about the differences between the information technology skills academia produces in graduates and the skills that industry needs in new hires, it is valuable to highlight various training methodologies leveraged by industry to fill their training gaps.

Tiered technology training. In 2002, Albert Huang wrote an article for the *Journal of End User Computing* that described a three-tiered strategic approach to information technology training. Quoting Sein et al (1999), Huang asserted that the primary reason that organizations provide information technology training is to empower employees to leverage technological applications to further business operations (as cited by Huang, 2002, p. 30). However, properly matching the quantity, depth, length, and recurrence of training to an employee's function or role within the organization can be a difficult challenge. Further complicating this issue is the question of the best mode or method of teaching various subject matter; for example, is computer based training (CBT), traditional instructor-led lecture, collaborative and exploratory labs, or

some combination of these the best way to prepare employees to leverage information technology in the workplace (Huang, 2002, p. 30)?

Citing Compeau et al (1995), Huang asserts that breaking training down into three stages – initiation, delivery, and post-training – helps keep information technology training focused on meeting the operational requirements of the organization (as cited by Huang, 2002, p. 32). Huang proposes that businesses are responsible for helping new employees bridge the knowledge gap that academia does not provide; to do so, he recommends implementing a training strategy broken into three tiers.

First is general technology education, which creates baseline knowledge of general and technical skills amongst employees, and may include topics ranging from hardware and networking to security best practices and government mandates (Huang, 2002, p. 34). Next is business application training, which provides specialized application training to employees based on their roles within the organization. Training in this tier is both specific and deep, and creates functional experts across various technological focus areas (Huang, 2002, p. 34). The last tier is just in time training, which provides checklist-style instructions to employees to help facilitate rapid and accurate task accomplishment, rather than foster depth of learning and understanding (Huang, 2002, p. 35).

Professional certifications. Since the late 1980s, the field of information technology has acknowledged the value that professional certifications bring to the industry. Although professional certifications are not the only consideration employers take into account when hiring new employees, possessing industry-accepted certifications does convey that the employee possess a baseline specialty knowledge needed to accomplish the job they are being considered for (Olagunju & Zongo, 2010, p. 67). Within the information technology industry,

professional certifications make job candidates more marketable, increase an employee's potential for promotion, and can lead to higher wages (Olagunju & Zongo, 2010, p. 68). According to a 2015 study, nearly one fourth of all information technology positions required some form of professional certification (Burning Glass, 2015, p. 1). A 2006 study by Hentea, Dhilon, and Manpreet showed that academic degrees, professional certifications, and job experience are the primary criteria employers use when determining an individual's overall qualification for an information technology position (as cited by Knapp, Maurer, & Plachkinova, 2017, p. 102). Knapp, Maurer, & Plachkinova assert that employers use these three criteria as a greater overall indicator of a person's ability to solve problems, grasp content knowledge, and leverage critical thinking skills (Knapp, Maurer, & Plachkinova, 2017, p. 102).

When it comes to exam curricula, organizations that provide information technology professional certifications are constantly updating and refreshing their coursework so as to stay as close to the bleeding edge of technological change as possible. Although many factors drive these updates, the needs of the workforce, the current threat landscape, technological changes, industry standards, and government regulations are the five primary indicators that certifying bodies use to spark curricula change (Knapp, Maurer, & Plachkinova, 2017, p. 103).

The efforts of certifying organizations to stay relevant to the field is why Knapp, Maurer, and Plachkinova suggest that information technology training curricula, for both academia and in-house industry training programs, should smartly incorporate professional certifications into their overall education plans. Staying abreast of new certification material helps keep curricula content current and relevant; when combined with hands-on learning environments, information technology education programs structured this way have the potential to grow highly effective entry-level employees (Knapp, Maurer, & Plachkinova, 2017, p. 106-107).

In 2005, the United States Department of Defense first published *DoD 8570.01-M, Information Assurance Workforce Improvement Program*. Although the document has undergone multiple revisions since its inception, the directive mandates that its information technology workforce maintain various levels of industry certification. This requirement applies up and down the information technology workforce chain, and includes both technical experts (IAT Levels I-III) and managers (IAM Levels I-III). In many cases, a failure to maintain the directed level of certification can become grounds for reassignment or termination (Assistant Secretary of Defense for Networks and Information Integration, 2015, p. 18-38).

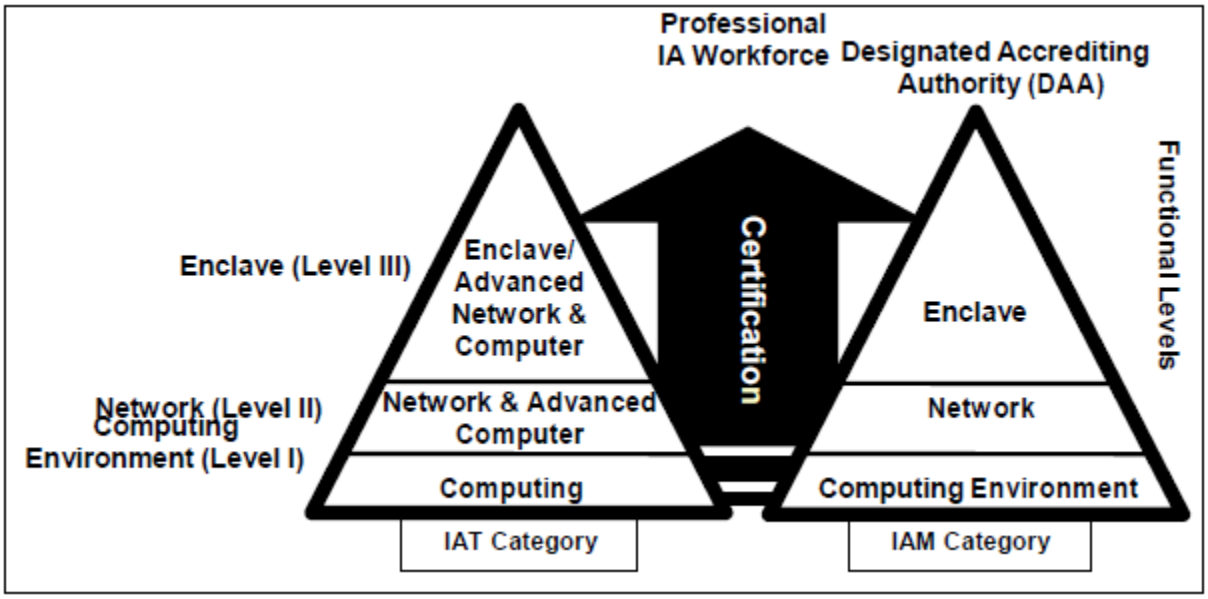


Figure 1. Overview of basic IA workforce structure (Assistant Secretary of Defense for Networks and Information Integration, 2015, p. 19)

Most experts acknowledge that the 8570 program is at least a small step in the right direction toward ensuring that information technology and cyberspace professionals possess some type of baseline specialty knowledge before operating on DoD networks. However, critics of the program argue that the minimum certifications required by the 8570 program do not align

closely enough to the specific systems or technologies that DoD employees are expected to operate, and rarely help them "train the way [they] fight," (Wingo et al, 2015, p. 26). For this reason, more specific training plan and education requirements, such as those outlined in NIST Special Publication 800-181, are often seen as a more valuable resource for the information technology community than the 8570 program.

Bloom's taxonomy. In 1949, 35-year-old Dr. Benjamin Bloom began efforts on a teaching and learning framework that would eventually become "widely used in the disciplines of teaching, curriculum writing, learning theory… content development, instruction, and assessment," (Seaman, 2011, p. 29). Bloom's Methodology, and the associated product known as "Bloom's Taxonomy," in part explains how students progress in the mastery of knowledge via three learning domains: psychomotor, cognitive, and affective (Weigel & Bonica, 2014, p. 21).

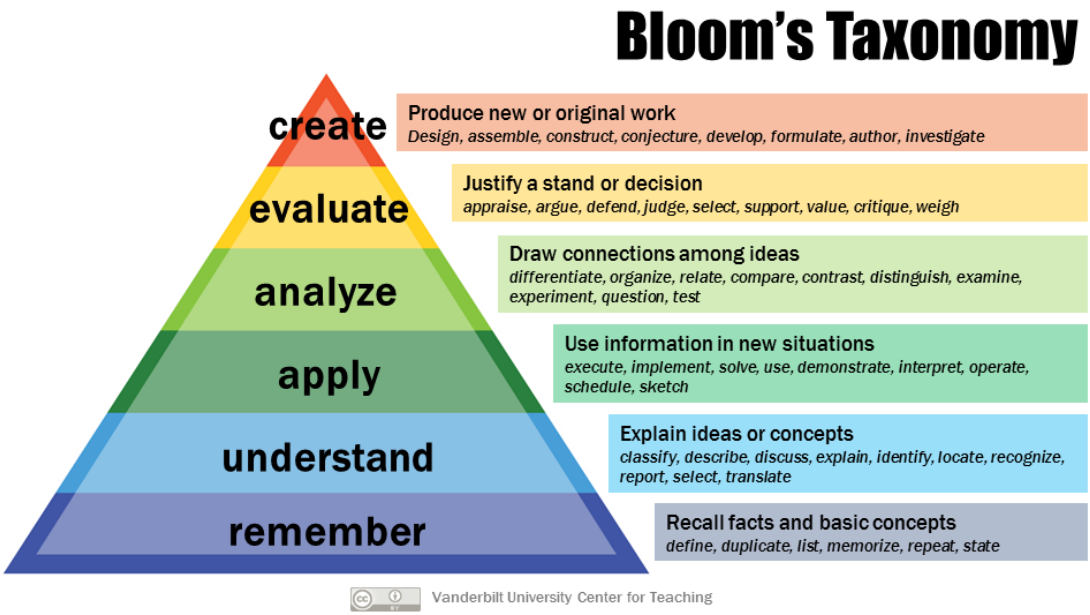


Figure 2. Bloom's Taxonomy (Armstrong, n.d., p. 1)

By the mid 1960's, the taxonomy gained the full attention of the education community, and has been a driving factor in shaping teaching strategies and curriculum development ever

since (Seaman, 2011, p. 31-36). Although the taxonomy received a major revision in 2001, which added new insights and refined ideas from the original document and decoupled Bloom's strict hierarchical structure of sequential learning from one step to the next, the taxonomy continues to facilitate the development of educational models around the globe (Seaman, 2011, p. 37-37).

Training vs education. In 2013, the Chief of Staff of the United States Air Force commissioned a study to better understand the current state of force development for its cyberspace forces. After three years, the Air Force Research Institute published *The Human Side of Cyber Conflict* which holistically assessed the Air Force's "cyber human capital planning and management strategies, and recommended improvements where needed," (Yannakogeorgos & Geis, 2016, p. xi). One of the primary conclusions of this study was that there is a marked difference between education and training, especially in the military and information technology environments (Yannakogeorgos & Geis, 2016, p. 148).

According to Yannakogeorgos and Geis, education is measured by means of formal academic training, the outcomes of that training (academic degrees), and significant time spent working in the associated discipline or field of study. Their study claims that training certifications, such as those acquired via professional or industry certifying bodies, are largely insufficient for today's information technology and cyberspace force. Although certifications may indicate that an employee has attained some level of knowledge or comprehension of the subject matter, ether via route memorization or checklist-style learning, Yannakogeorgos and Geis assert that this type of training does not equip students with the true critical thinking and problem solving skills required to solve new or emerging dilemmas in the cyberspace environment (Yannakogeorgos & Geis, 2016, p. 148-149). Using an adapted version of Bloom's

Taxonomy, the study further suggests that cyberspace operators and information technology technicians without a formal education will never reach the top tiers of learning (evaluation and creation) or be able to apply these concepts to solve real world problems (Yannakogeorgos & Geis, 2016, p. 149).

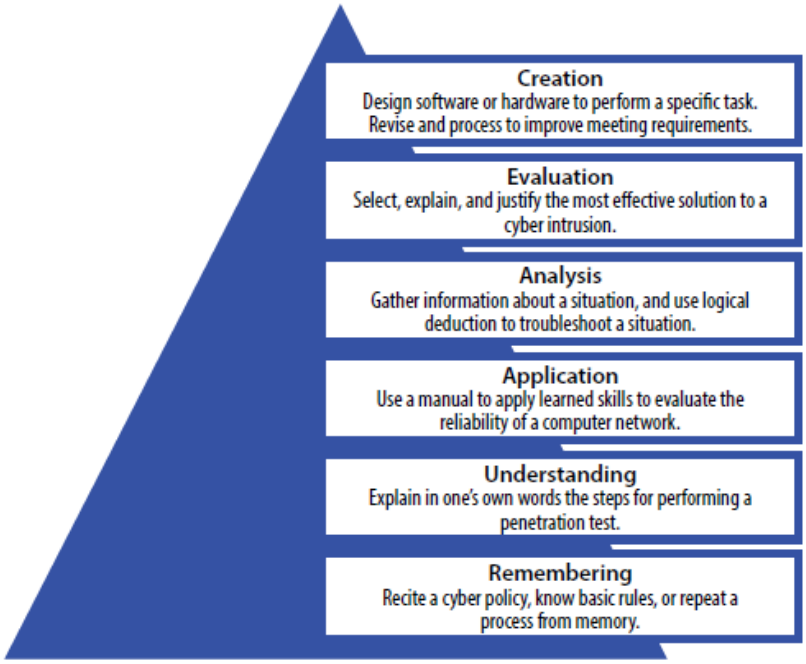


Figure 3. Cyber tasks at levels of Bloom's Taxonomy (Yannakogeorgos & Geis, 2016, p. 149)

Although formal education may play a critical role in a person's ability to effectively operate in the cyberspace domain, Yannakogeorgos and Geis' study found that across the Air Force, only 35 percent of personnel in the cyberspace career field possess a bachelor's degree that is at all related to cyberspace or information technology (Yannakogeorgos & Geis, 2016, p. 153).

Government

Government regulation continues to shape the standards that organizations train to and

operate under. Although a commonly held belief is that the innovative nature of industry drives rapid changes in training requirements and national standards, various organizations within the United States government are often the source for industry-accepted best practices in the world of information technology and cybersecurity. For example, the National Security Agency (NSA) maintains a strict set of criterion for institutions of higher learning that desire to be certified as National Centers of Excellence in Cyber Operations or Cybersecurity (National Security Agency Central Security Service, 2016, p. 1). Similarly, the National Institute of Standards and Technology (NIST), at the behest of former United States President Barak Obama, developed a framework for identifying, recruiting, developing, and retaining talent in the cyberspace. This framework is better known as the *National Initiative for Cyberspace Education (NICE)* (Newhouse, Keith, Scribner, & Witte, 2017, p. ii).

National Initiative for Cyberspace Education (NICE). Since 2013, the NICE framework has been the de facto standard for all American organizations to follow when it comes to organizing, training, and equipping an effective and competent cyberspace workforce. Detailed in *NIST Special Publication 800-181*, NICE defines the competencies of information technology and cyberspace employees based on their individual knowledge, skills, and abilities (KSAs). The NICE framework describes these KSAs as the specific traits needed to properly accomplish work tasks, where knowledge is an understanding of information as it applies to job performance, skill is the application of the appropriate tools to accomplish a task, and ability is competence in performance that leads to a desired outcome (Newhouse, Keith, Scribner, & Witte, 2017, p. 6).

As depicted below, the NICE framework serves as a starting point for organizations who desire to build a capable and ready information technology and cyberspace workforce. The

framework breaks the cyberspace workforce into seven primary workforce categories (securely provision, operate and maintain, oversee and govern, protect and defend, analyze, collect and operate, and investigate), each of which is further broken down into various specialty areas and work roles. Although not all of these categories fall directly under the umbrella of information technology, taken together they define the range of cyberspace operations an organization reliant on 21st century cyberspace should plan for and train to (Newhouse, Keith, Scribner, & Witte, 2017, p. 11-23). The NICE then defines over 1,000 tasks, 600 knowledge descriptions, 300 skills descriptions, and 150 abilities descriptions, which are applied to workforce categories as applicable. The result is a tangible and robust description of the KSAs and associated tasks an organization should grow in its workforce and expect from its employees (Newhouse, Keith, Scribner, & Witte, 2017, p. 24-122).

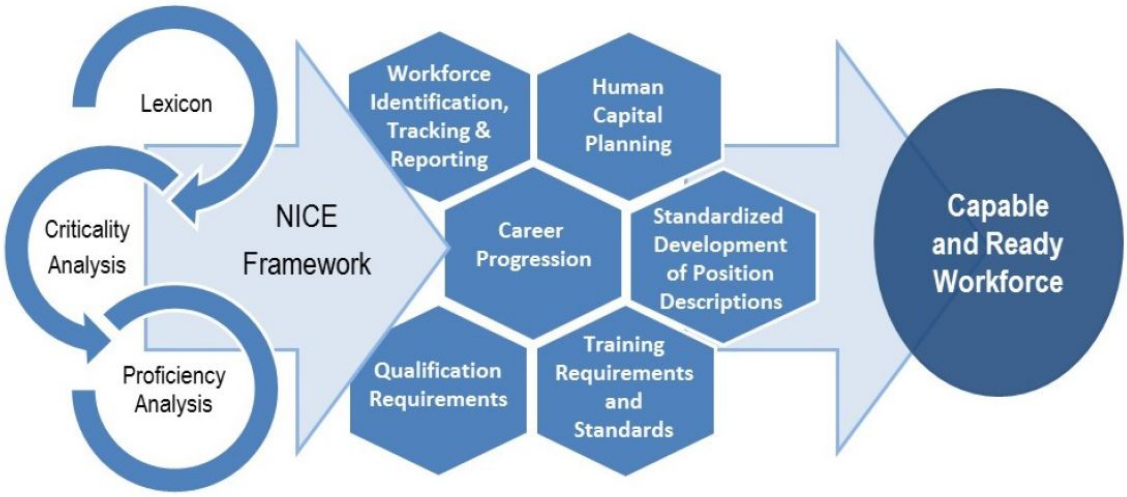


Figure 4. Building blocks for a capable and ready cybersecurity workforce (Newhouse, Keith, Scribner, & Witte, 2017, p. 7)

Tying It All Together – The Cyberspace Competency Model

In 2013, the US Department of Labor commissioned its Employment and Training

Administration (ETA) to work alongside the original developers of the NICE framework to create a Cybersecurity Competency Model. The model ties together the competencies required by the NICE framework, day-to-day technologists, and information technology and cybersecurity professionals (Wright, 2015, p. 16). The pyramid model considers the "soft skills' required by industry, the formal academic training depth as suggested by Yannakogergos and Geis, professional certifications which have become industry norms and are required by the Depart of Defense's 8570.01-M program, and the recommendations outlined in NIST Special Publication 800-181.

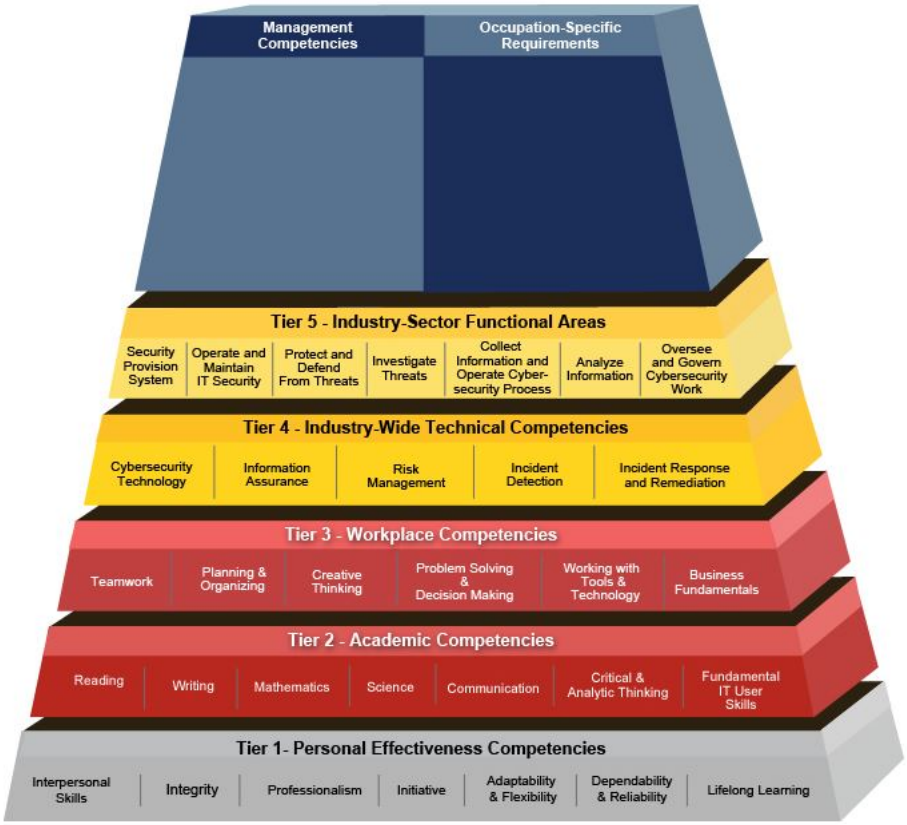


Figure 5. Cybersecurity competency model (Careeronestop Competency Model Clearinghouse, n.d., p. 1)

Information Technology Acquisitions Dilemma

One challenge that information technology specialists in the United States Air Force face is that the acquisition of the new technologies that they operate is often a hodge-podge effort accomplished by those with a limited understanding or expertise in the field of information technology (Yannakogeorgos & Geis, 2016, p. 38-39). When it comes to information technology and cyberspace, the challenges presented by the federal acquisitions process are no secret. The process is considered too slow to keep up with the exponential changes in technology produced by the industry; by the time equipment is fielded, it is antiquated and outmoded (Golaboski & Matus, 2011, p. 14-17). Alongside these challenges, Air Force level information technology acquisitions rarely include any accompanying force-wide training. The failure to program in training according to the needs of the technology system's lifecycle creates a perpetual gap in the knowledge, skills, and abilities of the workforce expected to operate it (Wingo et al, 2015, p. 28).

The Weapons System Argument

In 2013, the Air Force officially recognized the designation of the first six cyberspace weapons systems. These weapons systems provide peacetime and wartime functions for the Air Force within the cyberspace domain, and present these capabilities to combatant commanders in a standardized and commonly understood way. Advocates for the weapons system construct argue that there is no better way to ensure cyberspace technologies are properly planned for, funded, sustained, and modernized. Proponents contend that designating more cyberspace capabilities as weapons systems also guarantees that the Air Force will maintain a properly manned force that is trained with the right tactics, techniques, and procedures to operate on any equipment that is approved for use (Skinner, 2013, p. 41-43). The beauty of the weapons system construct is that any change or update to an approved information technology product – either

hardware or software - also automatically generates a need to update existing training documentation.

Air Force 3DXXX Model

In 2009, the Air Force overhauled its enlisted communications career field structure, moving away from the old 2EXXX, 3AXXX, and 3CXXX series Air Force Specialty Codes (AFSCs) and converting its personnel to the 3DXXX model. Included in this career field are 9 specific enlisted specialties; taken together, these specialties cover the preponderance of roles and responsibilities expected of a traditional information technology department, which the Air Force now couches under the umbrella term “cyberspace operations”. This research’s specific focuses are the 3D0X2 (Cyber Systems Operations), 3D0X3 (Cyber Surety), and 3D1X2 (Cyber Transport) career fields.

Accessions. Contrary to nearly all previously stated recommendations mentioned up to this point, the United States Air Force maintains only minimal standards of entry for enlisted personnel hoping to become cyberspace professionals. Academically, new accessions into the career field often only require a high school diploma or a GED, a general ASVAB score of 60 or above, and may or may not have to complete various entry-level skills demonstration courses prior to entering the career field (US Air Force, n.d., p. 1). Note that none of these requirements include any formal college education or industry certification whatsoever; this minimum standard increases the number of personnel eligible for recruitment into a career field which is historically undermanned, but ultimately diminishes the effectiveness of the force once these personnel enter the operational environment (Yannakogeorgos & Geis, 2016, p. 52). Citing the USAF’s Cyber Vision 2025 (US Air Force Chief Scientist, 2012, p. 70), Yannakogeorgos and Geis highlight that the Air Force acknowledges that most personnel who demonstrate the desired

level of cyber aptitude have at least some form of technical degree prior to entry; for those who do not, the Air Force has developed cyber aptitude screening tests in an attempt to identify and place only those personnel who show a propensity for cyberspace operations into its 3DXXX workforce (Yannakogeorgos & Geis, 2016, p. 52-55).

Formal training. Air Force formal training follows the Instructional System Development (ISD) model, which the organization has used to guide training development since 1965 (Wimmer, 2012, p. 11). The model helps curricula developers determine what types of instruction are required to most effectively and efficiently train new Airmen. Internal and external evaluations (instructor and trainee feedback, test results, evaluation reports, inspections, etc.) are the central feedback mechanisms that drive refinement in each outlying step of the model. When a student demonstrates achievement of a minimum passing criteria in a particular area, that feedback suggests that the formal training has accomplished its objective in that area (Wimmer, 2012, p. 13-14). The model is cyclical, and requires continual inputs from the field to stay relevant.

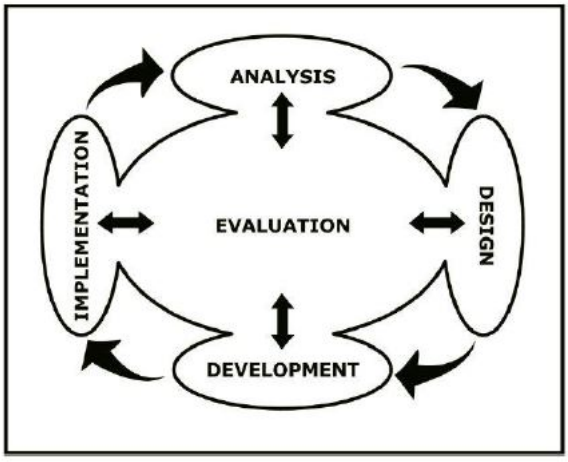


Figure 6. ISD model (Wimmer, 2012, p. 12)

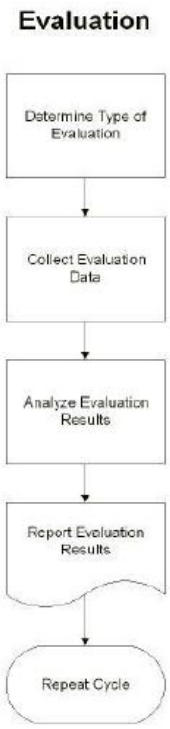


Figure 7. ISD evaluation model (Wimmer, 2012, p. 13)

Upon completion of basic training, new 3D0X2, 3D0X3, and 3D1X2 recruits are shipped to Keesler Air Force Base, where there are expected complete between 50 and 136 days of formal career field technical school introductory training, based on their assigned AFSC (Air Force, n.d., p.1). The curricula covered at these schoolhouses vary greatly; however, graduates of this training possess a Cisco Security+ certification (which meets DoD 8570 IAT level 2 requirements) and are approved to continue their training and education at their follow-on duty location (Secretary of the Air Force Chief Information Officer, 2014). Previously identified shortfalls in the acquisitions process, coupled with the exponential rate of change seen in information technologies, make it challenging to keep formal instructional material relevant, especially in a career field with broad applications whose final proficiency evaluations may vary greatly from mission set to mission set. For this reason, formal career field training is both broad

and foundational in nature, and does not aim to create technical experts who have reached the top tiers of Bloom's taxonomy as an output.

Career field education and training plans. Training, education, and force development for each AFSC is governed by a corresponding career field education and training plan (CFETP). When combined with the USAF's Training Business Area (TBA), CFETPs help career field functional area managers "plan, manage, and control training within the career field," (Secretary of the Air Force Chief Information Officer, 2014, p. 4). These documents standardize the knowledge, skills, and abilities required for mastery of an AFSC, provide timelines for when Airmen should hit education and training gates, and lists training courses, sources, and mediums (Secretary of the Air Force Chief Information Officer, 2014, p. 16). CFETPs also publish career path charts for each AFSC (as seen below), which associate training, education, experience, and development goals with years of service and Air Force ranks. While some of the milestones are prescriptive, many are not (meaning that career advancement is possible even without achieving every listed career gate); career path charts spell out the preferred route for Airmen to follow as they grow in their career fields.

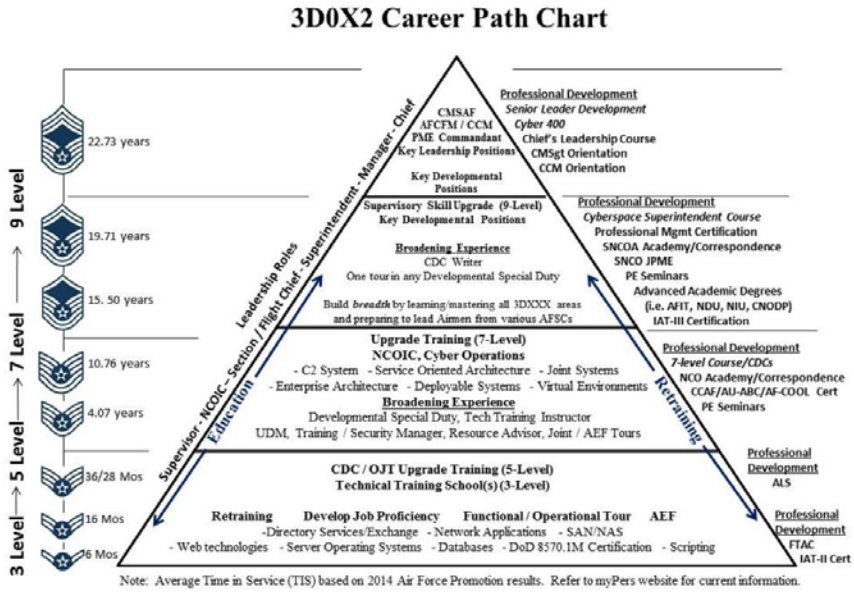


Figure 8. 3D0X2 career path chart (Secretary of the Air Force Chief Information Officer, 2015, p. 17)

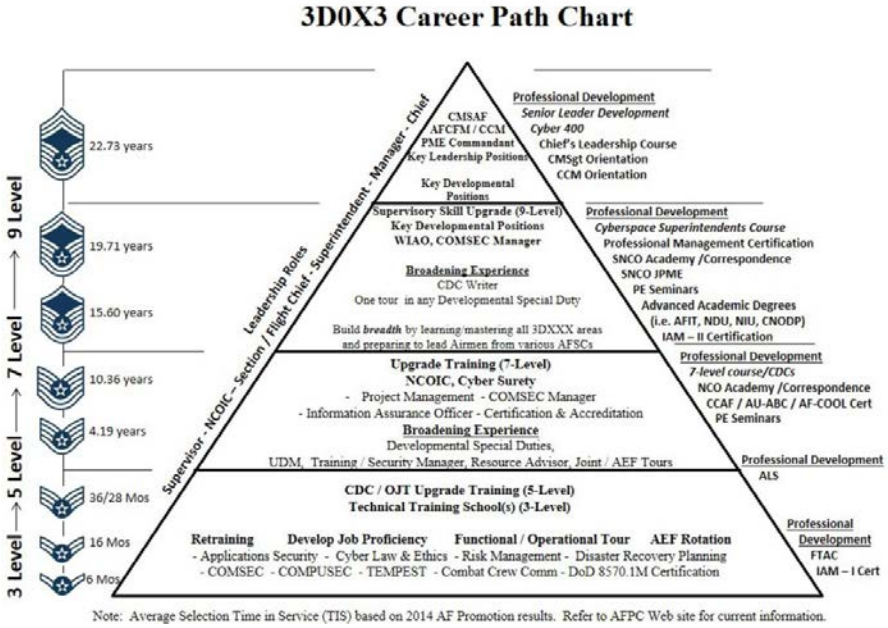


Figure 9. 3D0X3 career path chart (Secretary of the Air Force Chief Information Officer, 2014, p. 18)

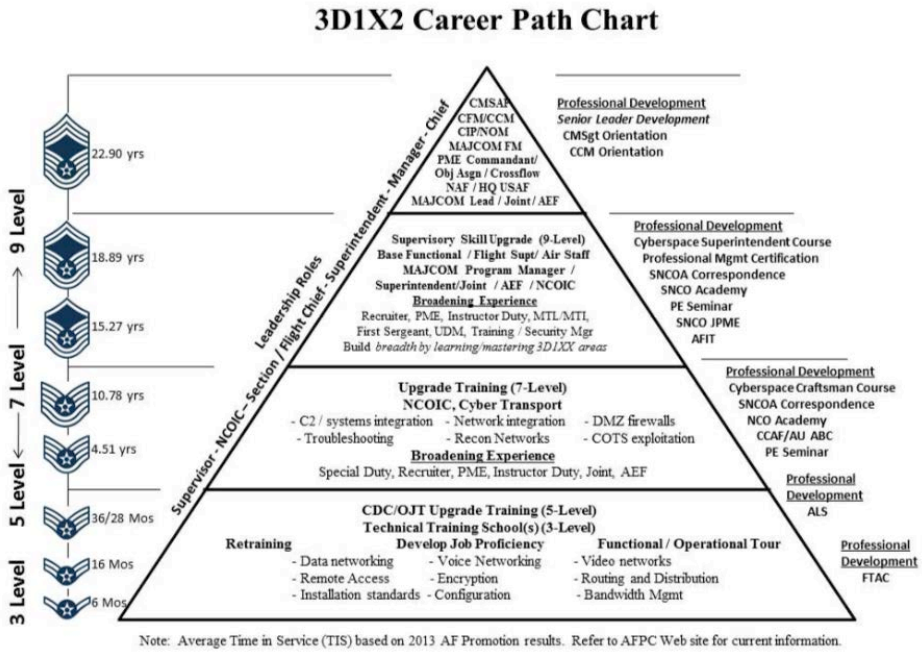


Figure 10. 3D1X2 career path chart (Department of the Air Force, 2014, p. 22)

Skill levels. Air Force progressive training follows the traditional trade school model of Apprentice-Journeyman-Craftsman-Superintendent. Alternately referred to by Air Force Airmen as a three-level, five-level, seven-level, and nine-level, these skill levels are tied to promotion and are awarded by accomplishing a consortium of knowledge and skill-based tasks, as outlined in each career field's CFETP (Wingo et al, 2015, p. 26).

Awarding of the three-level is granted at the completion of the Keesler technical schools. Awarding of the five-level is granted after a minimum of 12 months of on-the-job training, completion of appropriate Career Development Course (CDC) training material, completion of locally generated equipment training requirements, completion of any applicable Computer Based Tasks (CBTs), and completion of AFSC specific requirements as outlined by the CFETP.

Airmen cannot be awarded their seven-level until reaching the rank of Staff Sergeant, completing 12 months of on-the-job training, applicable CDCs, locally generated equipment

training tasks, and CFETP requirements.

Airmen cannot be awarded their nine-level until reaching the rank of Senior Master Sergeant and completing the Cyberspace Superintendent Course, applicable CBTs, and locally generated equipment training tasks (Secretary of the Air Force Chief Information Officer, 2014, p. 24-25). It is noteworthy that Airmen cannot be promoted to the rank of Senior Master Sargent without first earning their Community College of the Air Force two-year associate's degree, explained later in this paper (Newcomer, Glassman, DaCosta-Paul, & Fowler, 2016, p. 32).

On the job training. After leaving initial technical training, an Air Force enlisted Airmen may not receive formal schoolhouse education again until reaching the rank of Technical Sargent, generally between 10 and 11 years of service (Secretary of the Air Force Chief Information Officer, 2014, p. 27-29). Therefore, any training required to attain a 5-level or 7-level is done "on the job," and is taught by more senior Airmen assigned to the same duty station. There is often a significant time delta from when new hardware and software is fielded and when any formal training on how to operate and maintain that equipment is published to the field.

There is also no forcing function requiring Airmen to re-certify on their skill level once attained, even if the course content under which they originally certified becomes dated or irrelevant, based on the current organizing and equipping of the force. This can become an especially pointed problem after a career field merger, similar to that of the 2009 conversion of the 2EXXX, 3AXXX, and 3CXXX career fields into the 3DXXX series. Such actions place mid-level Non Commissioned Officer managers in charge of training and mentoring more junior Airmen on systems and technologies that they themselves have no knowledge of or background in. All of this leads to an on the job training cadre of five-levels and seven-levels who are largely

unequipped to sufficiently train those beneath them, and a force-wide training program that is non-standardized and largely watered down (Wingo et al, 2015, p. 27).

Air Force Education Programs. On a more positive note, the Air Force has made significant headway moving away from a "training only" model to a mix of both training and more in-depth academic education. Upon graduating basic military training, all cyberspace operations Airmen are automatically enrolled in the Air Force's Community College of the Air Force (CCAF) degree program, an associates of applied science degree accredited by the Southern Association of Colleges and Schools (Newcomer, Glassman, DaCosta-Paul, & Fowler, 2016, p. 31).

To earn the degree, Airmen must complete 64 credit hours of coursework, which includes credit hours in technical education, leadership, military and management education, physical and general education, and various elective studies. Many of these degree requirements are automatically satisfied by completing basic military training, entry-level technical schools, various military development schools (Airman Leadership School, Noncommissioned Officer Academy and Senior Noncommissioned Officer Academy) and transferring any prior college credits (Newcomer, Glassman, DaCosta-Paul, & Fowler, 2016, p. 31). Airmen can test out of general education courses by leveraging the College-Level Examination Program (CLEP); those who choose not to CLEP can attend general education courses free of charge through the Air Force's General Education Mobile (GEM) program. Although the Air Force requires its Senior Master Sergeants and Chief Master Sergeants to possess a CCAF, Airmen are encouraged to complete the degree before reaching the rank of Technical Sergeant (Yannakogeorgos and Geis, 2016, p. 125).

The Air Force also participates in a program known as the Air University Associate-to-

Baccalaureate Cooperative (AU-ABC), which guarantees Airmen who have earned their CCAF the opportunity to complete regionally and nationally accredited online four-year degree programs “in as few as 60 semester hours beyond the CCAF,” (Newcomer, Glassman, DaCosta-Paul, & Fowler, 2016, p. 32).

Both industry and the military place a heavy emphasis on “soft skills” that are not directly tied to technical competencies. The Air Force expects its personnel to adhere to its Core Values of integrity, service, and excellence, and sends both its enlisted and officer corps to professional developmental education courses meant to advance their leadership and military competencies (Yannakogeorgos and Geis, 2016, p. 112-113)

Combat Communications Training Model

Air Force combat communications units are specialized telecommunications providers, whose mission is to expeditiously deploy information technology and telecommunications systems to tactical environments around the world. As such, Airmen assigned to these units must receive specialized local training that goes above and beyond what is outlined in their CFETP or is taught at technical school.

Unit type code qualifications. Unit type codes, or UTCs, are the basic building blocks upon which the Air Force’s force presentation model is designed, and describe unique capabilities that the Air Force can provide to support a Joint Forces Commander or an operational plan. A UTC is built to tie a standardized warfighting capability to the specific equipment and personnel required to deliver that capability. By leveraging the logistics detail (LOGDET) system, unit logistician can also help wartime planners understand the transportation constraints required to move a UTC from its in-garrison home to its deployed location. Understanding the operating environment and leveraging the Manpower and Equipment Force

Packaging System (MEFPAK) under which all UTCs fall, helps wartime planners ensure that the right support and warfighting capabilities are designed into their operational plans (Burk, 1988, p. 1-4).

Because a UTC provides a specific capability that may be unique to only a small handful of units, local training plans must be developed to ensure personnel are qualified to operate and maintain it. Deployable communications fall under the 6KXXX family of UTCs, and are assigned to the Air Force's 5 active duty, 15 guard, and 3 reserve combat communications units. Airmen entering these units must not only complete their standard CFETP-driven tasks, but must also be separately qualified on UTC tasks.

The three-level dilemma. Air Force Instruction 10-401 warns against establishing apprentice-level deployable UTC requirements. Three-levels have not typically received enough on the job training to deploy autonomously, and therefore require direct supervision to operate effectively in the deployed environment. Unless a "break" in training is established, deploying three-levels also implies that both supervisors and trainees will have to purposely plan time away from accomplishing their primary duties in the work center to accomplish training (Secretary of the Air Force Operational Planning Policy and Strategy, 2006, p. 101). However, three-levels are often used to fulfill unit manning requirements, even though they do not meet minimum skill level requirements for the positions they will be placed in. This can be problematic for combat communications units, whose manning requirements are based on the UTCs they are assigned. This model often forces three-levels to fill positions on UTCs for which they are unqualified, which can have a detrimental impact on the UTC's overall mission effectiveness.

Training prioritization. For UTC-driven organizations, the unit's ability fulfill its mission capability (MISCAP) statement is of supreme importance. Because individual UTC training is

one of the primary factors that dictate whether or not a unit can meet its MISCAP, military commanders must prioritize where their personnel will concentrate their training efforts. Often times, focusing on UTC training to become “mission ready now” comes at the expense of CFETP upgrade training or academic education. Although the temptation to prioritize UTC training is understandable, this practice inevitably leads to fielding a force that has a shallow “checklist-style” knowledge of the UTC, and possesses no depth in the theory or knowledge required to expertly employ the capability that the UTC provides.

Field Training Unit. To tackle this problem, the combat communications community recently organized a field training unit (FTU) in Savannah, GA, which provides focused upgrade and UTC training to its new accessions. Course content is controlled by the community, and can be rapidly adjusted to meet the force’s needs as technology and equipment changes. By allowing students to focus solely on training tasks, the FTU will reduce the typical combat communications on-the-job training pipeline from 12 months to four weeks. Although students will not leave the FTU “ready to upgrade,” the schoolhouse will cover up to 60 percent of the required CFETP upgrade training tasks, significantly reducing the training burden on unit-level trainers and dramatically increasing the standardized training baseline provided to the force. The schoolhouse opened its doors to students in January of 2018, and expects to train 3,800 Airmen in the coming year (Woods, 2017, p. 1). Although the FTU does not hold the combat communications community to the same rigorous training standard as the weapons system model, it does help refocus training and education back toward the recommendations previously addressed in this paper.

Methodology

Data Collection Technique

This study was primarily informed by two data collection methods. The first was an extensive literature review, which described the range of variables and techniques that affect the quality of information technology training provided to new employees. The literature review provided a common foundational knowledge built on the efforts of earlier researchers and the results of their studies.

The second data collection method was an anonymous online survey. This survey was built to gather and evaluate opinions on initial entry information technology training from employees across the active duty combat communications force. The survey was developed and administered using the online survey tool SurveyMonkey; participants were recruited via email and pointed back to the survey using a unique web link. The survey consisted of 10 primary sections, which included a demographics collection, questions about various types of information technology training, and a section reserved for questions on the effects of the 2009 3DXXX career field merger (1 - demographics, 2 - technical school training, 3 – 8570 training, 4 – formal education, 5 – on-the-job training, 6 – training others, 7 – vendor supplied training, 8 – unit type code training, 9 – job competency questions, 10 – career field merger questions). Each section averaged from 4 to 7 questions; the outlier was the demographics section, which asked 17 questions. In total, the survey included 65 unique questions; a copy of these questions is located in Appendix A.

The demographics section included both multiple choice and open response questions. This section identified a respondent’s AFSC, skill level, rank, years of service, highest level of academic education, various training roles, and experience within the combat communications

community. The demographics section was used primarily to ensure the research captured the intended sampling of responses from target AFSCs and career fields.

Sections 2 through 8 focused heavily on various information technology training methodologies, and how respondents perceived the effect of this training on increasing their job-related knowledge, skills, and abilities. For most questions, respondents were given the option to select one of five multiple-choice answers, ranging from “Strongly Disagree,” to “Strongly Agree.” All but one of these sections also included open-response fields for respondents to provide additional comments on the quality of the various training mechanisms, and how those mechanisms applied to their ability to succeed as a member of a combat communications unit. The section on 8570 training included two additional questions, which provided respondents with an opportunity to comment on their perceived value of industry certifications, and whether or not certifications outside of those mandated by the 8570 program would better increase their job effectiveness. Section 9 of the survey assessed the perceived cumulative effectiveness of the Air Force and combat communications training programs, by gauging the respondent’s level of confidence to deploy immediately on a mission without assistance from others. This section also captured respondents’ perception of training timelines, by asking how long they expected it to take to create a “confident and comfortable” combat communicator. Finally, section 10 of the survey asked respondents to provide feedback on the effects on training of the 2009 career field merger, ranging from “Strongly Disagree,” to “Strongly Agree.”

Subjects and Setting

Voluntary participation in this survey was extended to all members of the 3D0X2, 3D0X3, and 3D1X2 career fields within the five active duty combat communications squadrons. The survey was extended to a military-only population, which included males and females

ranging in age from 18 to 40 years old who had been employed by the Air Force between 1 and 20 years. Invitation to participate was extended to personnel whose skill levels ranged from Apprentice to Superintendent, and whose rank ranged from E1 to E9.

Invitations were sent via email to both the squadron commander and the director of operations of each unit, with an attached request to forward the survey information and corresponding link down to the appropriate personnel. Participants were given two weeks to complete the survey; a reminder email was sent one week before the survey closed, and again one day before the survey closed. The anonymous nature of the research makes it impossible to tell if the survey made its way down to the appropriate audiences in every squadron; demographic information revealing which unit a person was assigned to was purposefully omitted to protect the identity of the respondent. The author requested that the survey also be sent to deployed members from the various units, who might otherwise have been overlooked for this type of data collection.

Analysis

The quantitative analysis for this research was accomplished using the built-in tools provided by SurveyMonkey's software. For most quantitative questions in this research, respondents were given the choice of selecting one of five options on a typical Likert scale, ranging from "Strongly Disagree," to "Strongly Agree." In some cases, answers available were binary in nature ("yes" or "no"), or were specific to the demographic data requested. For each of these questions, the SurveyMonkey software automatically generated basic data such as minimum, maximum, median, mean, and standard deviation. The software also provided graphical representations of the data, depicting a bar graph and the associated answer percentage,

per response option, per question. The unfiltered results of this data are available in Appendix A, below.

Using the tools provided by SurveyMonkey, the researcher was also able to cross-tabulate results by performing a comparative analysis on distinct data sets. In this case, comparative analysis was performed twice, once by classifying respondents by AFSC, and then by classifying them by skill level. Although not depicted in Appendix A, many of the outcomes of this comparative analysis are discussed in results section below. By using these results in conjunction with the associated qualitative comments from respondents, the researcher was able to correlate answers in a way that allowed for the development of basic assumptions for each of the study's null hypotheses.

Limitations of Study

Time. As the work had to be completed within 16 weeks, this study is limited by the amount of time available for both research and analysis. Time is also a limiting factor in that the research only considers the current state of the combat communications community; therefore, any projects or activities not completed by the end of the study are not considered in the analysis, even if the result of those efforts may someday change or alter the findings (for example, further development of the combat communications field training unit). While this study is intended to be comprehensive in nature, it is ultimately limited by the time allotted to it.

Scope. The scope of this research is limited to the combat communications Active Duty force. Although comparative data from the Department of Defense, United States Air Force, and various industry leaders is presented, this paper is intended to help the reader draw conclusions about USAF Active Duty combat communications program only.

Access. Access to a large sample of combat communications personnel, training plans,

unit data, and types of information is limited. This limitation exists because USAF combat communications units are geographically separated around the globe, and many are currently deployed away from their home stations. The tyrannies of distance, time, and operational demands play a factor in access and availability of the aforementioned resources.

Participants. This study is limited by the number of participants willing to complete surveys, interviews, and to provide requested information. Although a large sampling plan is used, there are key participants in the study whose inputs are essential for the data to maintain relevance.

Bias. The author acknowledges that he is currently a member of an Active Duty combat communications unit, and therefore possesses a number of pre-existing notions concerning the quality and effectiveness of Air Force cyber training. To keep these biases from tainting the results, great effort to remain impartial and to interpret the data fairly was a requirement.

Results

Demographics and Response Distribution

During the two-week window that the survey was open, 67 personnel chose to respond. Of these, 36.9% were 3D0X2's, 10.8% were 3D0X3's, and 52.3% were 3D1X2's (see figure 11). Concerning respondent skill levels, 23.1% were 3-levels, 36.9% were 5-levels, 38.5% were 7-levels, and 1.54% were 9-levels (see figure 12). Concerning rank, 57.8% of respondents were between the ranks of E1-E4, 34.4% were between E5-E6, and 7.81% were between E7-E9 (see figure 13).

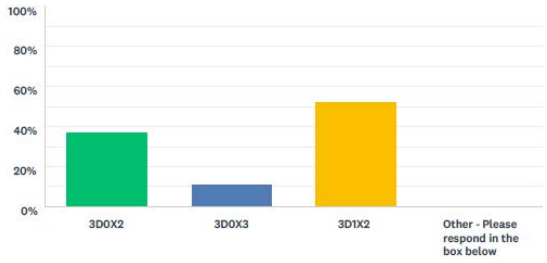


Figure 11: AFSC distribution

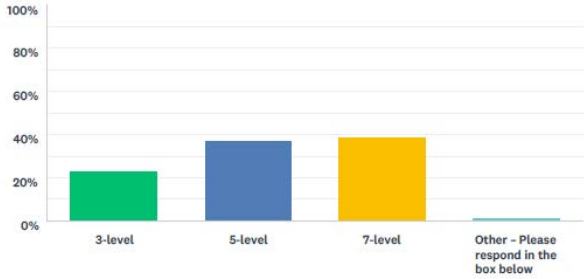


Figure 12: Skill level distribution

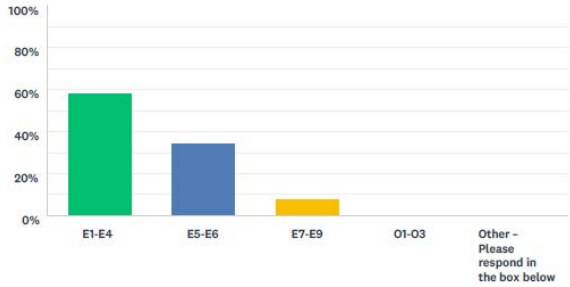


Figure 13: Rank distribution

Of those who chose to respond to the survey, 9.2% had served on active duty less than one year, 15.3% had served between one and two years, 29.2% had served between two and four years, 18.5% had served between four and 10 years, 12.3% had served between 10 and 15 years, and 15.4% had served more than 15 years (see figure 14). Concerning time spent serving in a combat communications unit, 26.2% had served less than one year, 26.2% had served between one and two years, 24.6% had served between two and four years, and 23.1% had served between four and 10 years (see figure 15). Nearly 32% of respondents had previously served with a unit other than combat communications, while 68% had not (see figure 16).

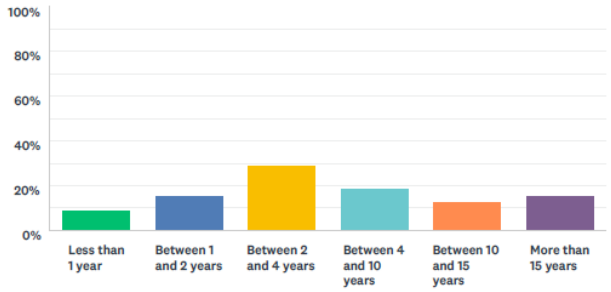


Figure 14: Active duty service distribution

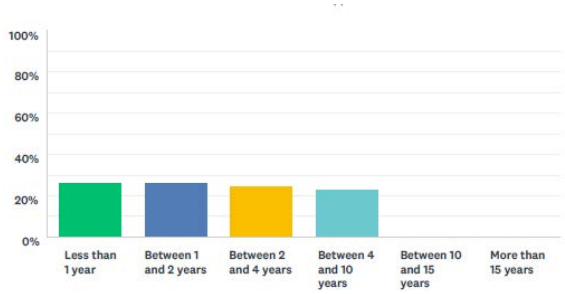


Figure 15: Combat communication service distribution

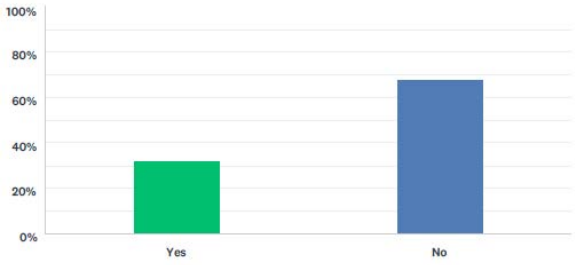


Figure 16: Service in unit other than combat communications

Concerning deployments, 49% of respondents had previously deployed with a combat communications unit, while 51% had not (see figure 17). For other deployments not associated with combat communications, 40% had previously deployed with another unit, and 60% had not (see figure 18).

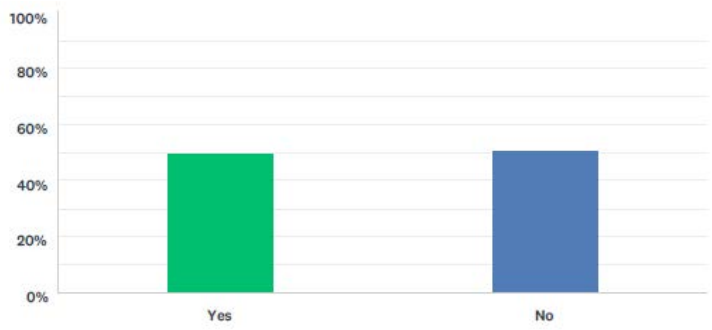


Figure 17: Deployed with combat communications unit

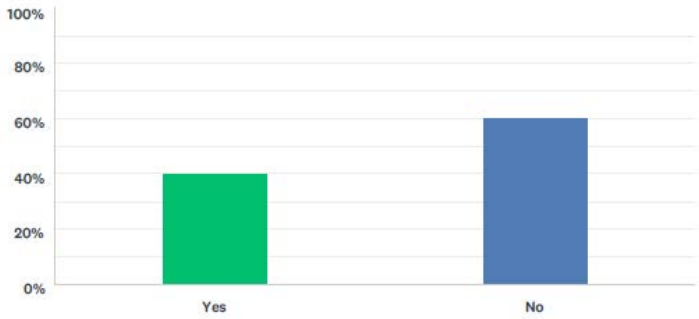


Figure 18: Deployed with unit other than combat communications

Supervisory duties were levied upon 40% of respondents, while 60% had not yet supervised others (see figure 19). However, 47% of respondents answered that they were in charge of training others on upgrade training, while 52% were not (see figure 20). Similarly, 52% of respondents answered that they trained others via OJT and for UTC training, while 48% did not (see figures 21 and 22).

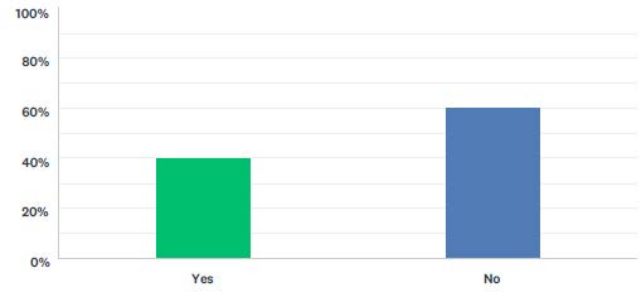


Figure 19: Supervisor duties distribution

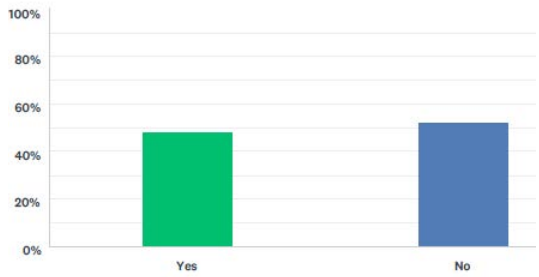


Figure 20: Upgrade trainer distribution

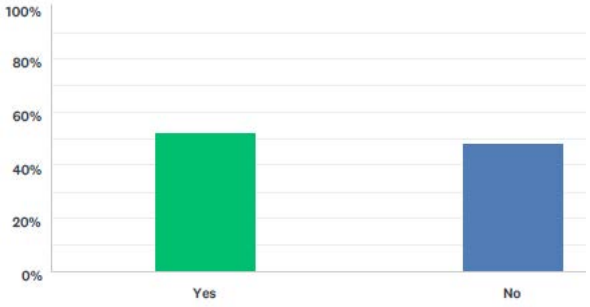


Figure 21: OJT trainer distribution

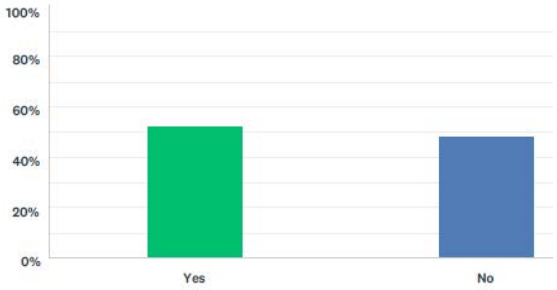
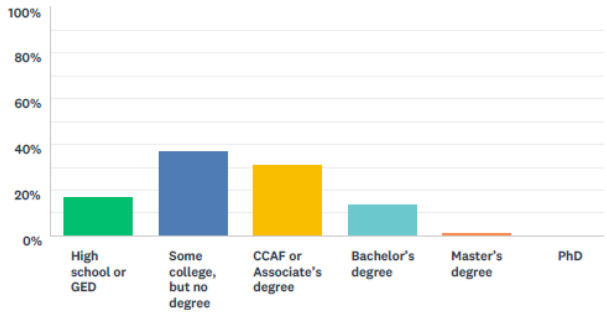


Figure 22: UTC trainer distribution

Of those who chose to answer concerning highest level of academic education attained, 17% had a high school diploma or GED, 37% had some college but no degree, 31% had a CCAF or associate's degree, 14% had a bachelor's degree, and 1% had a master's degree. No respondents had attained a PhD (see figure 23).

The 2009 merger affected 30% of respondents. The career field merger did not affect 70% of those surveyed (see figure 224).



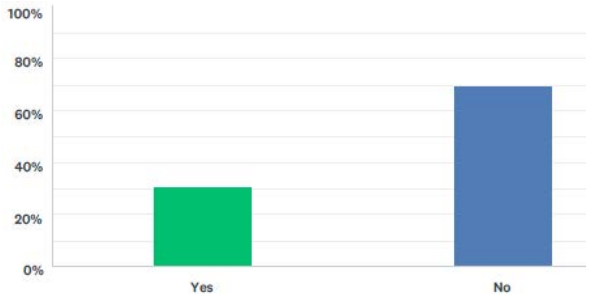


Figure 23: Respondent education distribution

Figure 24: 2009 merger distribution

When asked if technical school training helped equip them with the right knowledge to succeed in a combat communications unit, 19.4% of respondents strongly disagreed, 38.7% disagreed, 21% were neutral, 21% agreed, and 0% strongly agreed (see figure 25).

When asked if technical school training helped equip them with the right skills to succeed in a combat communications unit, 24.2% strongly disagreed, 35.5% disagreed, 21% were neutral, 16.1% agreed, and 3.2% strongly agreed (see figure 26).

When asked if technical school training helped equip them with the right abilities to succeed in a combat communications unit, 20.6% strongly disagreed, 36.5% disagreed, 25.4% were neutral, 15.9% agreed, and 1.6% strongly agreed (see figure 27).

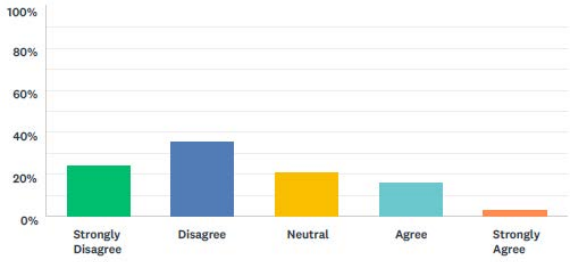


Figure 25: Tech school knowledge distribution

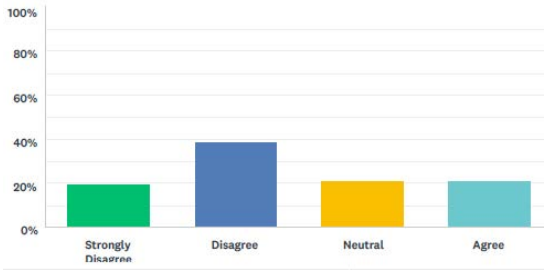


Figure 26: Tech school skills distribution

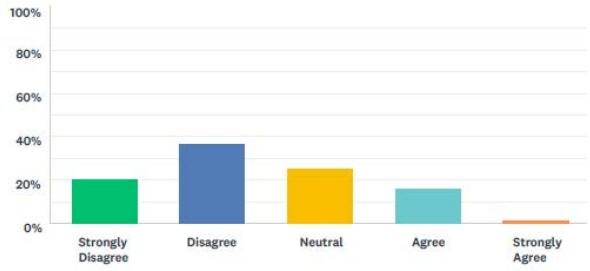


Figure 27: Tech school abilities distribution

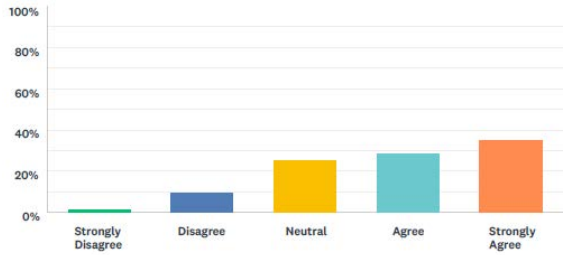


Figure 28: Change tech school distribution

When asked if 8570-mandated certifications helped equip them with the right knowledge to succeed in a combat communications unit, 10.7% of respondents strongly disagreed, 19.6% disagreed, 33.9% were neutral, 25% agreed, and 10.7% strongly agreed (see figure 29).

When asked if 8570-mandated certifications helped equip them with the right skills to succeed in a combat communications unit, 10.5% strongly disagreed, 40.4% disagreed, 22.8% were neutral, 17.5% agreed, and 8.8% strongly agreed (see figure 30).

When asked if 8570-mandated certifications helped equip them with the right abilities to succeed in a combat communications unit, 12.3% strongly disagreed, 33.3% disagreed, 31.6% were neutral, 17.8% agreed, and 7% strongly agreed (see figure 31).

Figure 32 shows that 82.1% of respondents plan to pursue other professional certifications related to the information technology industry, while 17.9% do not. Figure 33 shows that 85.2% of respondents felt there are better industry certifications available, which would make them more effective at their jobs than those prescribed to them by their AFSC's 8570 requirement. Figure 34 shows respondents thoughts on the need to change industry certifications to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider; of those surveyed, 16.1% strongly agreed, 35.7% agreed, 26.8% were neutral, 16.1% disagreed, and 5.4% strongly disagreed.

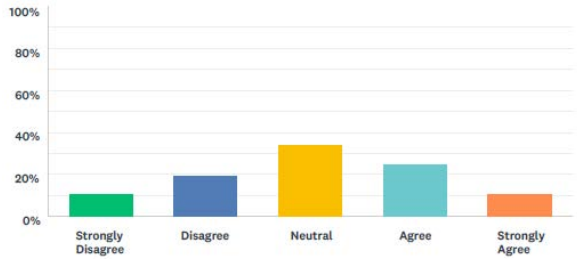


Figure 29: 8570 knowledge distribution

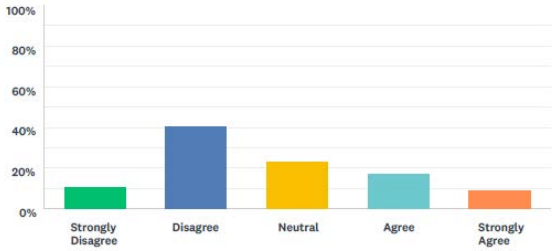


Figure 30: 8570 skills distribution

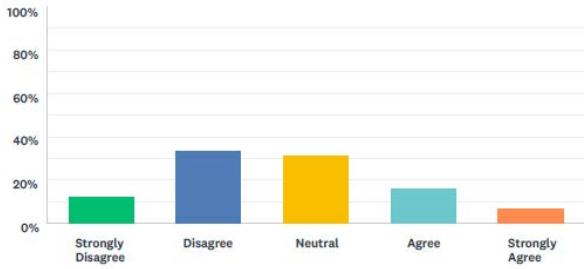


Figure 31: 8570 abilities distribution

Figure 32: Certification pursuit distribution

Figure 33: Other certifications distribution

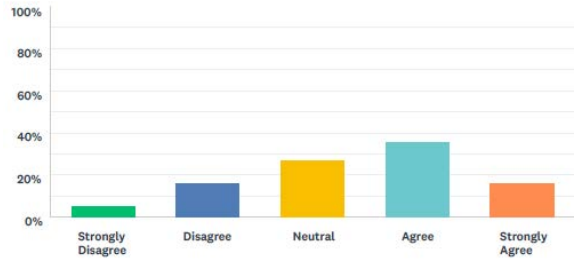


Figure 34: Change 8570 trng distribution

When asked if a formal information technology related education helped equip them with the right knowledge to succeed in a combat communications unit, 5.5% of respondents strongly disagreed, 18.2% disagreed, 29.1% were neutral, 43.6% agreed, and 3.6% strongly agreed (see figure 35).

When asked if a formal information technology related education helped equip them with the right skills to succeed in a combat communications unit, 3.6% strongly disagreed, 21.8% disagreed, 40% were neutral, 30.9% agreed, and 3.6% strongly agreed (see figure 36).

When asked if a formal information technology related education helped equip them with the right abilities to succeed in a combat communications unit, 3.6% strongly disagreed, 16.4% disagreed, 38.2% were neutral, 38.2% agreed, and 3.6% strongly agreed (see figure 37).

Figure 38 shows respondents thoughts on the need to change information technology related education to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider; of those surveyed, 1.8% strongly disagreed, 16.4% disagreed, 30.9% were neutral, 36.4% agreed, and 14.6% strongly agreed.

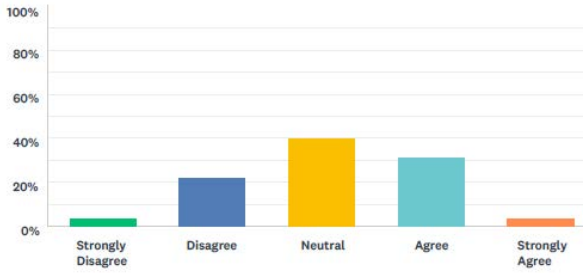


Figure 35: Education knowledge distribution

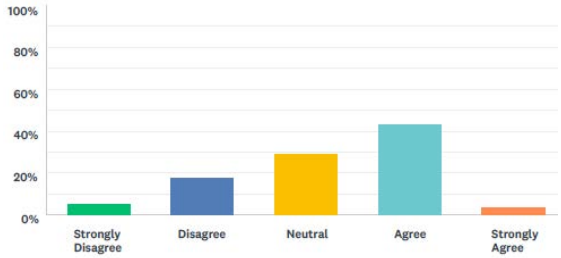


Figure 36: Education skills distribution

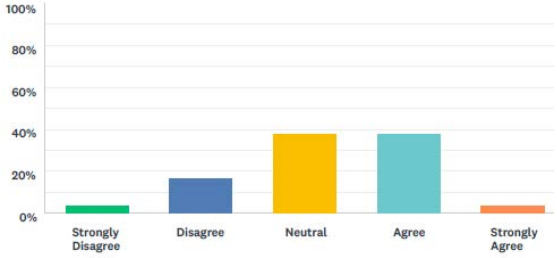


Figure 37: Education abilities distribution

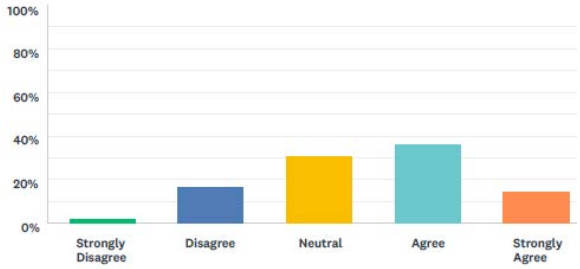


Figure 38: Change education distribution

When asked if on-the-job training has helped equip them with the right knowledge to succeed in a combat communications unit, 5.7% of respondents strongly disagreed, 11.3% disagreed, 9.4 % were neutral, 41.5% agreed, and 32.1% strongly agreed (see figure 39).

When asked if on-the-job training has helped equip them with the right skills to succeed in a combat communications unit, 5.6% strongly disagreed, 9.3% disagreed, 11.1% were neutral, 46.3% agreed, and 27.8% strongly agreed (see figure 40).

When asked if on-the-job training has helped equip them with the right abilities to succeed in a combat communications unit, 3.7% strongly disagreed, 11.1% disagreed, 14.8% were neutral, 44.4% agreed, and 25.9% strongly agreed (see figure 41).

Figure 42 shows respondents thoughts on the need to change on-the-job training to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider; of those surveyed, 5.6% strongly disagreed, 16.7% disagreed, 33.3% were neutral, 22.2% agreed, and 22.2% strongly agreed.

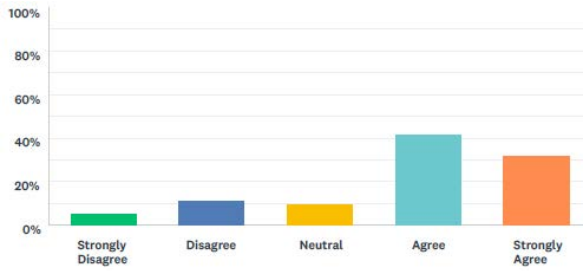


Figure 39: OJT knowledge distribution

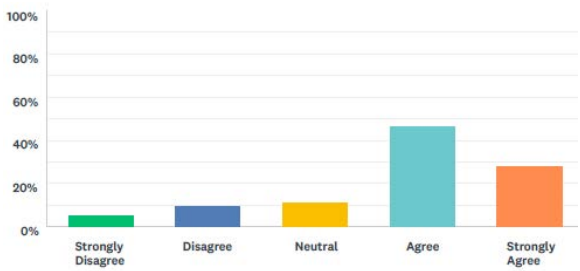


Figure 40: OJT skills distribution

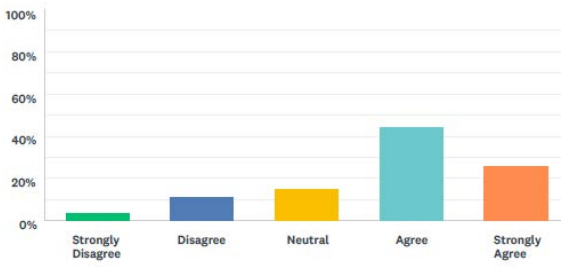


Figure 41: OJT abilities distribution

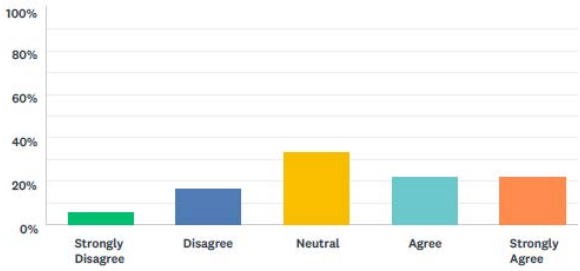


Figure 42: Change OJT distribution

When asking 5-levels if they possessed the requisite career-field knowledge to effectively train their 3-level subordinates, 0% of respondents strongly disagreed, 3.8% disagreed, 17% were neutral, 45.3% agreed, and 3.8% strongly agreed (see figure 43).

When asking 5-levels if they possessed the requisite career-field skills to effectively train their 3-level subordinates, 0% strongly disagreed, 3.7% disagreed, 16.8 % were neutral, 42.6% agreed, and 7.4% strongly agreed (see figure 44).

When asking 5-levels if they possessed the requisite career-field abilities to effectively train their 3-level subordinates, 0% strongly disagreed, 3.7% disagreed, 18.5% were neutral, 42.6% agreed, and 5.6% strongly agreed (see figure 45).

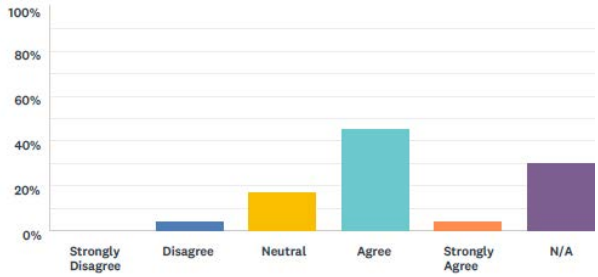


Figure 43: 5-lvl Trainer knowledge distribution

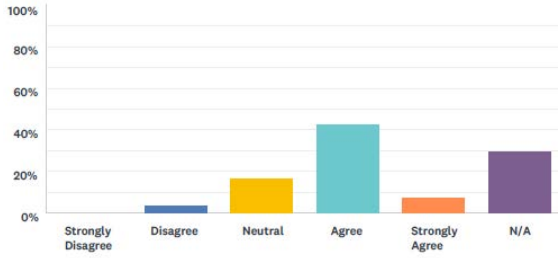


Figure 44: 5-lvl trainer skills distribution

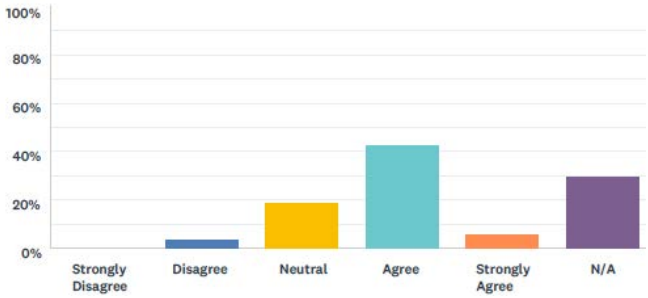


Figure 45: 5-lvl trainer abilities distribution

When asking 7-levels if they possessed the requisite career-field knowledge to effectively train their 3-level subordinates, 0% of respondents strongly disagreed, 1.9% disagreed, 7.6% were neutral, 35.9 % agreed, and 3.8% strongly agreed (see figure 46).

When asking 7-levels if they possessed the requisite career-field skills to effectively train their 3-level subordinates, 0% strongly disagreed, 1.9% disagreed, 7.6% were neutral, 34% agreed, and 5.7% strongly agreed (see figure 47).

When asking 7-levels if they possessed the requisite career-field abilities to effectively train their 3-level subordinates, 0% strongly disagreed, 1.9% disagreed, 7.6% were neutral, 34% agreed, and 5.7% strongly agreed (see figure 48).

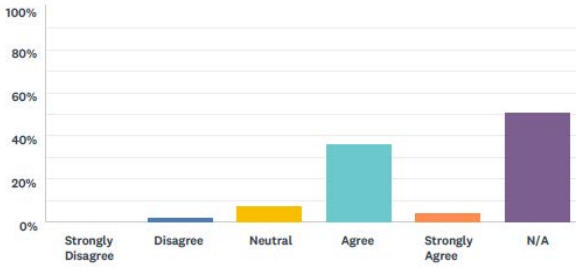


Figure 46: 7-lvl trainer knowledge distribution

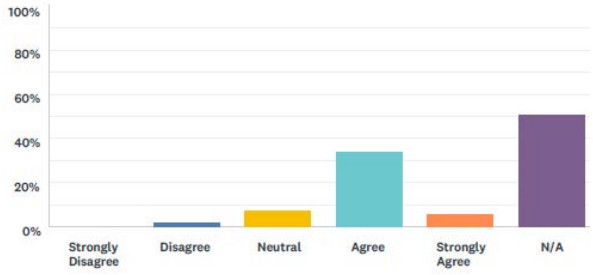


Figure 47: 7-lvl trainer skills distribution

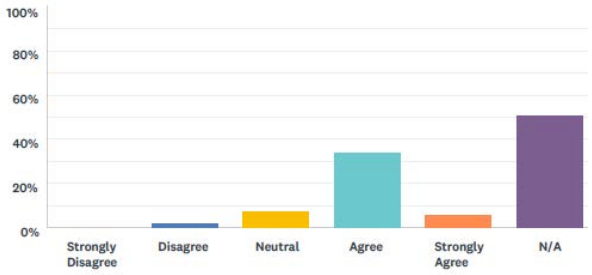


Figure 48: 7-lvl trainer abilities distribution

When asked if vendor-provided training has helped equip them with the right knowledge to succeed in a combat communications unit, 11.1% of respondents strongly disagreed, 11.1% disagreed, 38.9% were neutral, 31.5% agreed, and 7.4% strongly agreed (see figure 49).

When asked if vendor-provided training has helped equip them with the right skills to succeed in a combat communications unit, 11.1% strongly disagreed, 11.1% disagreed, 42.6% were neutral, 27.7% agreed, and 7.4% strongly agreed (see figure 50).

When asked if vendor-provided training has helped equip them with the right abilities to succeed in a combat communications unit, 11.1% strongly disagreed, 13% disagreed, 42.6% were neutral, 25.9% agreed, and 7.4 % strongly agreed (see figure 51).

Figure 52 shows respondents thoughts on the need to change vendor-provided training to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider; of those surveyed, 3.7% strongly disagreed, 14.8% disagreed, 48.1% were neutral, 14.8% agreed, and 18.5% strongly agreed.

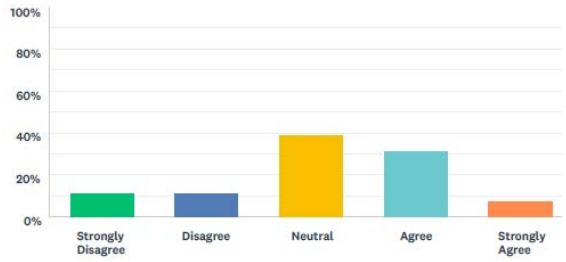


Figure 49: Vendor knowledge distribution

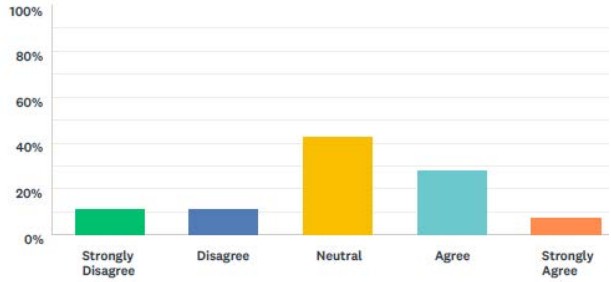


Figure 50: Vendor skills distribution

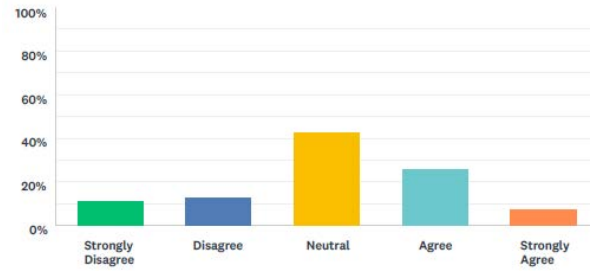


Figure 51: Vendor abilities distribution

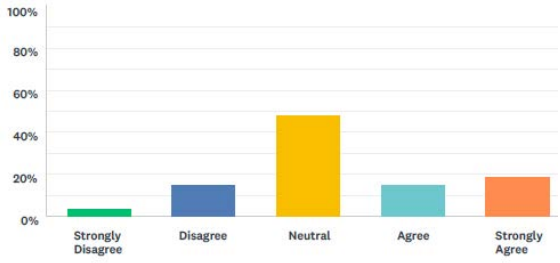


Figure 52: Change vendor trng distribution

When asked if unit type code training has helped equip them with the right knowledge to succeed in a combat communications unit, 0% of respondents strongly disagreed, 13.5% disagreed, 42.3% were neutral, 40.4% agreed, and 3.9% strongly agreed (see figure 53).

When asked if unit type code training has helped equip them with the right skills to succeed in a combat communications unit, 5.8% strongly disagreed, 17.3% disagreed, 42.3% were neutral, 34.6% agreed, and 0% strongly agreed (see figure 54).

When asked if unit type code training has helped equip them with the right abilities to succeed in a combat communications unit, 5.8% strongly disagreed, 17.3% disagreed, 42.3% were neutral, 34.6% agreed, and 0% strongly agreed (see figure 55).

Figure 56 shows respondents thoughts on the need to change unit type code training to help make new Airmen more effective in their role as a combat communicator; of those surveyed, 1.9% strongly disagreed, 3.8% disagreed, 65.4% were neutral, 19.2% agreed, and 9.6% strongly agreed.

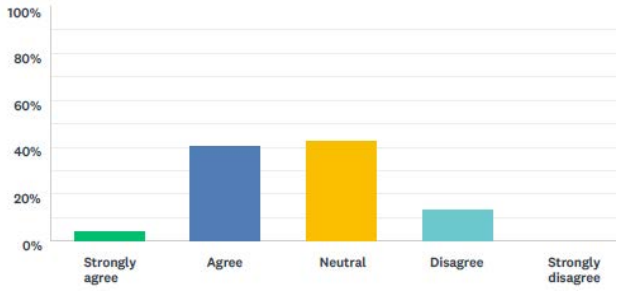


Figure 53: UTC knowledge distribution

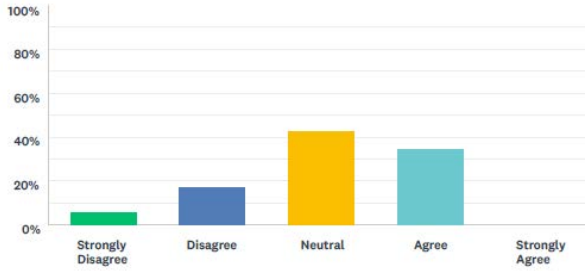


Figure 54: UTC skills distribution

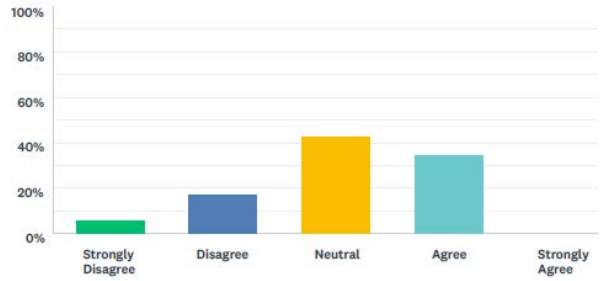


Figure 55: UTC abilities distribution

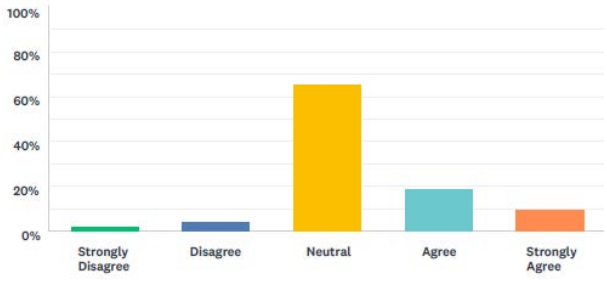


Figure 56: Change UTC trng distribution

Figure 57 shows responses to the statement, “I feel confident that if I left tomorrow, I could successfully complete a combat communications deployment with no one else from my AFSC along to help me.” Of those surveyed, 13.7% strongly disagreed, 29.4% disagreed, 13.7% were neutral, 31.4% agreed, and 11.8% strongly agreed with this statement.

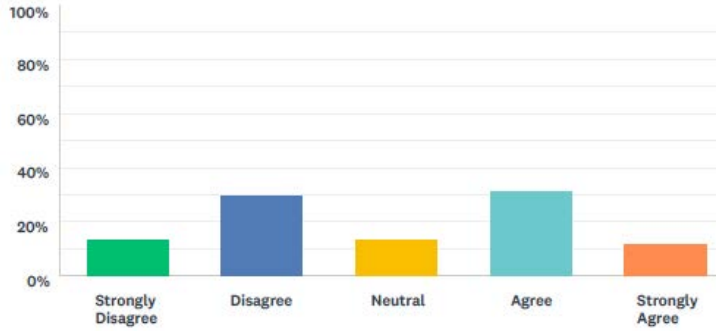


Figure 57: Respondent training confidence distribution

Figure 58 shows respondents’ opinions on how long they feel it takes an Airmen to become confident and comfortable enough on the equipment to operate it independently. Of those surveyed, 3.9% chose 1 to 3 months, 3.9% chose 3 to 6 months, 35.3% chose 6 months to 1 year, 43.1% chose 1 to 2 years, and 13.7% chose more than 2 years.

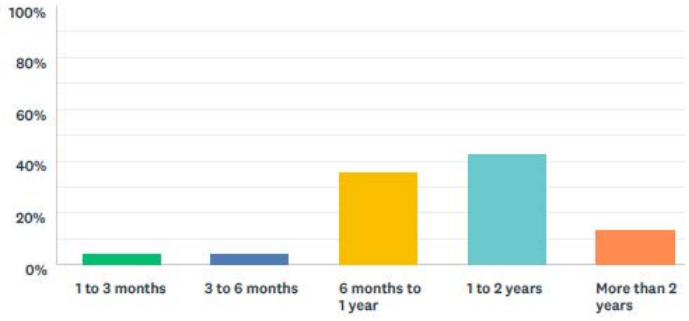


Figure 58: Respondent perceived training timeline distribution

Figure 59 shows responses to the statement, “I feel that the 3DXXX career field merger in 2009 negatively affected the quality of the on-the-job training that I can provide to my subordinates.” Of those surveyed, 2% strongly disagreed, 5.9% disagreed, 17.7% were neutral, 7.8% agreed, and 9.8% strongly agreed with this statement.

Figure 60 shows responses to the statement, “I feel that the 3DXXX career field merger in 2009 negatively affected the quality of the on-the-job training that I receive from my superiors.” Of those surveyed, 2% strongly disagreed, 3.9% disagreed, 21.6% were neutral, 9.8% agreed, and 9.8% strongly agreed with this statement.

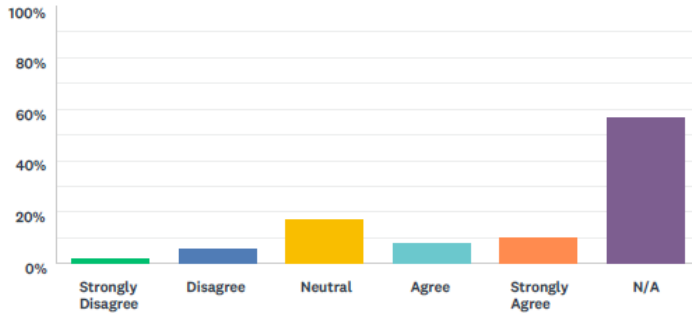


Figure 59: 2009 merger’s effect on training quality to subordinates

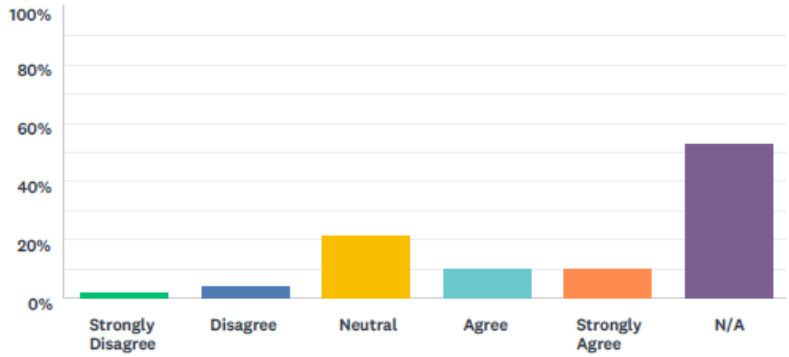


Figure 60: 2009 merger’s effect on training quality from superiors

When asked if the Air Force had done enough to properly equip them after the 2009 3DXXX career field merger with the right technical knowledge to succeed in their AFSC as a technician and as a supervisor, 5.9% of respondents strongly disagreed, 19.6% disagreed, 15.7% were neutral, 2% agreed, and 0% strongly agreed (see figure 61).

When asked if the Air Force had done enough to properly equip them after the 2009 3DXXX career field merger with the right technical skills to succeed in their AFSC as a technician and as a supervisor, 5.9% strongly disagreed, 17.7% disagreed, 15.7% were neutral, 4% agreed, and 0% strongly agreed (see figure 62).

When asked if the Air Force had done enough to properly equip them after the 2009 3DXXX career field merger with the right technical abilities to succeed in their AFSC as a technician and as a supervisor, 5.9% strongly disagreed, 17.7% disagreed, 15.7% were neutral, 4% agreed, and 0% strongly agreed (see figure 63).

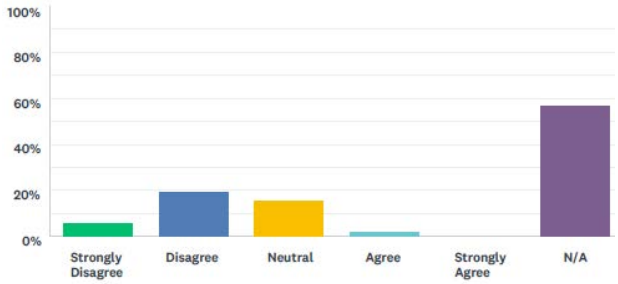


Figure 61: Merger knowledge distribution

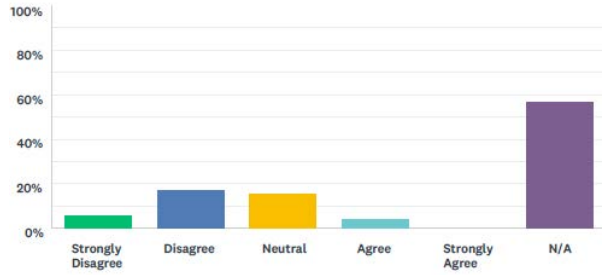


Figure 62: Merger skills distribution

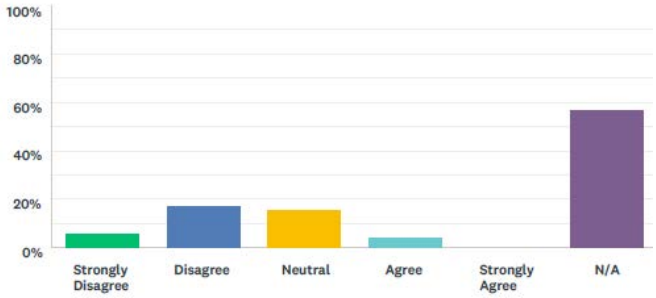


Figure 63: Merger abilities distribution

Discussion

Results Related to Hypotheses

The hypothesis that stated, “USAF technical school training does not equip students with the right tools to succeed in a combat communications unit,” was shown to be true. In the Quantitative analysis, more than 50% of respondents provided negative feedback about the training they received at technical school, while less than 20% provided positive feedback about their training experience. This feedback complimented the 60% of respondents who felt technical school needs to change to make Airmen more effective at their first duty station.

Qualitative feedback from respondents revealed that most felt technical school was too broad in nature, outdated, and not hands-on enough to provide true depth of learning in any specific career field. Respondents also discussed the lack of focus on tactical communications theory or equipment at technical school, pointing to the very niche mission of the USAF’s limited combat communications squadrons as the cause. The USAF training model uses a combination of technical school, upgrade training, UTC training, and OJT to build increased proficiencies in knowledge, skills, and abilities. Each of these training types is tailored to focus heavily on a specific development area; in this case, technical school should provide a firm foundational knowledge of the career field to Airmen, for follow on units to build on through OJT, UTC, and upgrade training. However, results of this study found that respondents did not feel technical school does enough to provide them with a firm foundational knowledge or prepare them to enter a combat communications unit.

The hypothesis that stated, “USAF-mandated 8570 training does not equip students with the right tools to succeed in a combat communications unit,” was shown to be true. Quantitative analysis showed that the majority of respondents felt at best neutral about the 8570 training they

had received thus far; most felt that the mandated training aided in helping knowledge, but not skills or abilities. The telling data for this question came when asking respondents about their views on additional certifications; over 80 percent planned to pursue additional certifications, and 85% felt that additional industry certifications would help make them more effective at their jobs than today's Security+ requirement.

Qualitative feedback indicated that most respondents saw at least some work-related value in attaining a Security+ certification; however, most felt that Security+ alone was not nearly enough to help them develop or prove proficiencies for their daily work. Respondents pointed to the fact that while security is one aspect of their work-related responsibilities, it is not the primary focus for most of them.

Worth noting is repeated reference to the fact that the Air Force does not operate across a standardized inventory of hardware or software; this makes it difficult to mandate service-wide 8570 training that is focused on vendor-specific technologies to help build skills and abilities. However, certifications are available that drive students to pursue a depth of knowledge that is more focused and applicable to career-field specific responsibilities.

If anything, current 8570 mandates for the Air Force communications career fields are not enough; Security+ is certainly a good starting point that helps the Air Force better secure its networks by building standardized security knowledge its technicians, but it does not provide the KSAs that matter most to technicians dealing with career-field specific technical problems.

The hypothesis that stated, "Formal academic education does not equip students with the right tools to succeed in a combat communications unit," was shown to be inconclusive. After the survey was released, it became apparent that the words "formal academic education" in questions 29-32 were misconstrued by some respondents to mean something other than

"undergraduate or graduate education." However, the quantitative responses provided by participants aligned with what one would expect from a higher-education learning program; the majority of respondents felt that formal academic education provided them with key knowledge and abilities that helped them succeed in a combat communications unit, but not necessarily with trade-craft related skills.

Qualitative responses that focused on the college aspect of formal education aligned with what Yannakogeorgos and Geis theorized, with one respondent even stating that, "seeking personal education in the IT field filled in large holes left by the Air Force Training programs." Note that although 67% of respondents had some college experience or a CCAF, only 15% of had a bachelor's degree or above. This is important because a CCAF is generally earned by applying credits earned directly from technical school; therefore, those with a CCAF may not have received any additional career-related formal education after finishing technical school. These respondents will likely have provided the same feedback about the effects of technical school on their KSAs as they did for formal education, as the two consist of largely the same coursework. Those working toward or currently in possession of a bachelor's degree will likely have a better understanding of the additional effects college has had on their KSAs.

The hypothesis that stated, "Unit provided on-the-job training does not equip students with the right tools to succeed in a combat communications unit," was shown to be false. Quantitative analysis showed that the vast majority of respondents felt that OJT helped equip them with the KSAs needed to succeed in a combat communications unit. However, this feedback contradicts responses to question #37, which showed that nearly 45% of respondents felt that OJT needed to change to provide more effective training.

Qualitative feedback pointed to a lack of time, unqualified trainers, and technicians' poor

foundational knowledge as the three primary factors negatively affecting the quality of OJT. The feedback concerning unqualified trainers seems to contradict the viewpoints of the trainers themselves, as the majority of five-levels and seven-levels indicated that they felt they possessed the requisite KSAs to effectively train their three-level subordinates. In any case, many respondents indicated that OJT remains the most directly applicable training mechanism for combat communicators to develop their KSAs.

The hypothesis that stated, "Vendor supplied training does not equip students with the right tools to succeed in a combat communications unit," was shown to be inconclusive. Although quantitative analysis showed a slightly more positive inclination toward the value of vendor-supplied training on KSAs, the majority of respondents remained neutral in their opinions of the value of such training. This likely has to do with feedback generated from the qualitative analysis, which showed that many respondents had never received vendor-supplied training on specific equipment or technologies, which limited the their ability to provide constructive feedback in this area. However, nearly all free responses indicated an interest in attending vendor supplied training; the common perception amongst these respondents was that such training provides specialized KSAs otherwise unavailable through traditional Air Force training mechanisms. Delivery of vendor-supplied training must be deliberately timed, provided to technicians once they become adequately familiar with the unique technologies employed by combat communications units and better understand the KSAs needed to effective operate those technologies.

The hypothesis that stated, "Unit provided unit type code training does not equip students with the right tools to succeed in a combat communications unit," was shown to be inconclusive. Although quantitative analysis revealed a positive trend in favor of UTC training, the majority of

respondents remained neutral when considering its effect on the focused development of KSAs. Strangely, an overwhelming majority remained neutral when offered the chance to change UTC training, possibly indicating that the training is adequately sufficient to meet the force's needs but not exemplary enough to keep it from being changed for the better. Another possibility is that the term "UTC training" could be have been taken to mean training from a variety of sources, to include those already built into CFETP upgrade training; this lack of clarity may have made some respondents wary to passionately respond for or against changing such training.

The hypothesis that stated, "The 2009 3DXXX career field merger did not negatively affect the quality of unit provided combat communications training," was shown to be false. After quantitative analysis, most respondents indicated that the merger negatively affected their ability to train their subordinates, and negatively affected the training that they received from their superiors. Less than four percent of respondents effected by the 2009 career field merger felt that the Air Force has done enough to properly equip them with the right KSAs to succeed in their AFSCs as technicians and supervisors.

Qualitative responses generally validated the concern that mid-level NCOs who were enlisted in the USAF during the 2009 merger, and who are now responsible for overseeing critical OJT, UTC, and upgrade training of others, may not possess the appropriate KSAs to effectively train their subordinates or grow technical experts in the force.

Future Research

There are two more populations that should be considered in future studies related to the same topic. Although this study focused solely on the active duty, the majority of the combat communications community is assigned to the guard or reserve. Personnel assigned to these units

have often been in the community much longer than their active duty counterparts, and in many cases serve in IT-related occupations in their day-to-day work outside of the USAF. Extending an invitation to these units to participate in a similar study would help researchers better understand the effects of training on the community as a whole. It may also prove informative to survey the active duty force again after the combat communications field training unit has better established itself, to measure the effects of that training on the technicians' KSAs.

The other population that should be considered in a follow on study is a sampling of 3DXXX personnel from across the greater USAF, specifically those associated with units outside of combat communications. Feedback on the USAF training pipeline from their perspective, from technical school to OJT training and beyond, would help better inform the effectiveness of training on the total force; such a study may prove a catalyst for change in how the USAF conducts training and focuses its training resources.

Summary

This study explored the effectiveness of the entry-level information technology (IT) technical training methodology currently employed by the United States Air Force (USAF). Effectiveness in this case meant the capability to deliberately grow the knowledge, skills, and abilities of employees, as defined by NICE framework.

The study showed that technical school training and 8570 industry certification training both require dramatic change if they are to make a meaningful difference in preparing entry-level Airmen to face the challenges of the daily workplace. However, the study also showed that on-the-job training in the combat communications community is adequate and effective in equipping Airmen for success in a combat communications unit.

The study was unable to definitively answer whether or not formal college education, vendor-supplied training, or unit type code training effectively grow the KSAs of Airmen to adequately prepare them to succeed in combat communications units.

Finally, the study showed that the 2009 career field merger negatively affected the quality of unit-provided combat communications training. Non-commissioned officers who participated in the study revealed that the Air Force's failure to focus on developing the KSAs of those personnel caught up in the transition caused a cascading effect on the quality of training they were able to provide to younger members of the force.

The results of this study show that entry-level combat communicators are often thrust into an operating environment that they are not adequately trained to handle, and call into question the effectiveness of the USAF's overall training strategy for its 3DXXX personnel. Exploring the impacts of entry-level IT training on other communications specialties across the Air Force would further prove or disprove this observation, and might better inform training strategies for IT organizations outside of the USAF.

Recommendations

The combat communications community should continue to focus on growing and refining the portions of the training pipeline under its direct control. Emphasis from all levels on the importance of OJT and UTC training cannot be understated; this hands-on training is invaluable for new combat communicators, and is going to get them the "most ready" to effectively deploy with the equipment. Vendor training should be made readily available to every combat communicator, once they have displayed a level of knowledge, skills, and abilities to make such training worthwhile. This training creates a depth of knowledge essential to growing

experts in the force. Formal college education also continues to play an important role in the development of skilled technicians; the community should continue to push its members to pursue undergraduate and graduate degrees in information technology related fields.

The Air Force should take a hard look at how it conducts 3DXXX technical school training. A more relevant, focused, hands-on curriculum should be used, which emphasizes developing specific KSAs of Airmen before sending them on to their first assignment. Although 8570 Security+ is a DoD requirement, the Air Force should consider the incorporation of additional career-specific industry certifications into its mandatory requirements for various AFSC CFETPs.

Without these changes, the Air Force should reconsider whether or not first-term Airmen, who have little to no career field experience, should be assigned to combat communications units. The simple fact remains that these units could deploy at a moment's notice, and that every person assigned to them must possess the KSAs to perform on the equipment and with little to no outside help. Inculcation in deliberate, lower-risk environments with more supervisory oversight may be the best way to prepare Airmen before sending them on to serve with combat communications units.

Finally, any notion by the USAF to further merge the cyber or communications career fields should meet strong resistance. These actions create technicians whose KSAs are overbroad and underdeveloped. Absent a well-executed reeducation and retraining plan, such actions also undermine the USAF's training strategy, as it places unqualified NCOs in the awkward position of providing career field specific guidance and OJT to new airmen, ultimately diluting the value of the training that they provide.

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Appendix A

Survey Questions

Entry Level Training for Combat Communications Personnel

Thank you for participating in our survey. Your feedback is important, and your answers will be COMPLETELY ANONYMOUS.

I, Josh Larson, am a student at American Public University, (APUS) and with the guidance of my instructor, Professor William Mcconnell, I have been approved by your Commander and by the APUS Institutional Review Board to conduct research on the effectiveness of entry-level technical skills training provided to new United States Air Force Airmen in combat communications units. No deception is involved, and the study involves no more than minimal risk to participants (i.e., the level of risk encountered in daily life).

You are invited to participate in this research project because you are a 3D0X2, 3D0X3, or 3D1X2 in a combat communications unit, or because you oversee the training and management of combat communicators in those career fields.

Your participation in this research study is voluntary. If you decide not to participate, you will not be penalized. However, if you decide to participate, you may withdraw from the study at any time without penalty. You may choose to skip any questions you do not wish to answer.

Participation in the study typically takes 20 minutes and is completely anonymous. Participants will be asked to complete an online survey. When data is reported, responses from individual participants will not be identified. Data will be reported in aggregate, and in the final report only.

All data is stored in a password protected electronic format. The data may be shared with my instructor, Professor William Mcconnell.

This research has been reviewed according to American Public University System IRB procedures for research involving human subjects. If you have any questions about the research study, please contact: the IRB Chair at American Public University System, apus-irb@apus.edu.

* ELECTRONIC CONSENT:

By selecting AGREE, you consent that:

- You have read and understand the information above regarding this study;
- You are voluntarily agreeing to participate in this study and understand that you can opt out at any time without penalty; and
- You are at least 18 years of age.

By selecting DISAGREE, you do not wish to participate in the research study, and may exit your browser.

Please select your choice below:

◯ Agree

◯ Disagree

Demographic Questions

What is your AFSC?

- ◯ 3D0X2
- ◯ 3D0X3
- ◯ 3D1X2
- ◯ Other - Please respond in the box below

What is your AFSC skill level?

- ◯ 3-level
- ◯ 5-level
- ◯ 7-level
- ◯ Other – Please respond in the box below

What is your rank?

- ◯ E1-E4
- ◯ E5-E6
- ◯ E7-E9
- ◯ O1-O3
- ◯ Other – Please respond in the box below

How many years of active duty service have you served?

- ◯ Less than 1 year
- ◯ Between 1 and 2 years
- ◯ Between 2 and 4 years
- ◯ Between 4 and 10 years
- ◯ Between 10 and 15 years
- ◯ More than 15 years

Are you a supervisor?

- ◯ Yes
- ◯ No

Are you formally charged with training others on upgrade training?

- ◯ Yes
- ◯ No

Are you formally charged with training others on on-the-job-training?

- ◯ Yes
- ◯ No

Are you formally charged with training others on Unit Type Code (UTC) training?

- ◯ Yes
- ◯ No

Are you formally charged with training others on any other kind of training?

- ◯ Yes – please describe the training you provide in the box below
- ◯ No

Please describe the training you provide

How many years have you served in a combat communications unit?

- ◯ Less than 1 year
- ◯ Between 1 and 2 years
- ◯ Between 2 and 4 years
- ◯ Between 4 and 10 years
- ◯ Between 10 and 15 years
- ◯ More than 15 years

Have you ever deployed with a combat communications unit?

- ◯ Yes
- ◯ No

Have you ever served in a unit other than combat communications?

- ◯ Yes
- ◯ No

Please list other types of units you have served with, but do not list the unit specifically (i.e., "base comm" or "ASOS" is acceptable, but "the 9th CS" is not.

Have you ever deployed with a non-combat communications unit?

- ◯ Yes
- ◯ No

Please select your highest level of formal academic education

- ◯ High school or GED
- ◯ Some college, but no degree
- ◯ CCAF or Associate's degree
- ◯ Bachelor's degree
- ◯ Master's degree
- ◯ PhD

Did your assigned career field change as a result of the 2009 3DXXX career field merger?

- ◯ Yes
- ◯ No

Technical School Training

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

Technical school equipped me with the right technical**knowledge** to succeed in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Technical school equipped me with the right technical**skills** to succeed in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Technical school equipped me with the right**abilities** to succeed in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Technical school needs to change, to help make new cyberspace/telecommunications Airmen more effective at their first duty station

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Please provide additional comments concerning how technical school should change to help make new cyberspace/telecommunications Airmen more effective at their first duty station in the box below

Please provide any other comments you may have concerning the training you received at technical school, as it applies to your ability to succeed as a member in a combat communications unit

8570 Training

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

My 8570-mandated industry certification (Security+) helped equip me with**knowledge** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

My 8570-mandated industry certification (Security+) helped equip me with**skills** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

My 8570-mandated industry certification (Security+) helped equip me with**abilities** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

I plan to pursue other professional certifications related to the information technology industry

- ◯ True - Please explain why you plan on pursuing additional industry-related professional certifications in the box below
- ◯ False - Please explain why you do not plan on pursuing additional industry-related professional certifications in the box below

Please add your comments in the box below

There are better industry certifications available, which would make me more effective at my job, than those prescribe to me by my AFSC's 8570 requirement

- ◯ True
- ◯ False

Please provide more details in the box below

Industry certifications needs to change, to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Please provide additional comments in the box below

Please provide any other comments you may have concerning your 8570-mandated industry certification, as it applies to your ability to succeed as a member in a combat communications unit

Formal Education

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

My formal information technology-related education helped equip me with**knowledge** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

My formal information technology-related education helped equip me with**skills** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

My formal information technology-related education helped equip me with**abilities** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Formal information technology-related education needs to change, to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Please provide additional comments in the box below

Please provide any other comments you may have concerning your undergraduate or graduate education, as it applies to your ability to succeed as a member in a combat communications unit

On The Job Training (OJT)

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

The on-the-job-training I have received since arriving at the unit has helped equip me with the **knowledge** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

The on-the-job-training I have received since arriving at the unit has helped equip me with the **skills** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

The on-the-job-training I have received since arriving at the unit has helped equip me with the **abilities** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

On-the-job-training needs to change, to help make new Airmen more effective in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Please provide additional comments in the box below

Please provide any other comments you may have concerning the on-the-job-training you have received since arriving at the unit, as it applies to your ability to succeed as a member in a combat communications unit

Training Others

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

As a 5-level in my AFSC, I feel that I possess the requisite career-field **knowledge** to effectively train my 3-level subordinates

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

As a 5-level in my AFSC, I feel that I possess the requisite career-field **skills** to effectively train my 3-level subordinates

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

As a 5-level in my AFSC, I feel that I possess the requisite career-field **abilities** to effectively train my 3-level subordinates

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

As a 7-level in my AFSC, I feel that I possess the requisite career-field **knowledge** to effectively train my 3-level subordinates

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

As a 7-level in my AFSC, I feel that I possess the requisite career-field **skills** to effectively train my 3-level subordinates

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

As a 7-level in my AFSC, I feel that I possess the requisite career-field **abilities** to effectively train my 3-level subordinates

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

Please provide any other comments you may have concerning your ability to train your 3-level subordinates

Vendor Supplied Training

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

The additional vendor-supplied training I have received since arriving at the unit has helped equip me with the **knowledge** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

The additional vendor-supplied training I have received since arriving at the unit has helped equip me with the **skills** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

The additional vendor-supplied training I have received since arriving at the unit has helped equip me with the **abilities** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Vendor-supplied training needs to change, to help make new Airmen more effective in their role as a combat communicator

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Please provide additional comments in the box below

Please provide any other comments you may have concerning the vendor-supplied training you have received, as it applies to your ability to succeed as a member in a combat communications unit

Unit Type Code Training

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

The Unit Type Code (UTC) training I have received since arriving at the unit has helped equip me with the **knowledge** needed to succeed in my job in a combat communications unit

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

The Unit Type Code (UTC) training I have received since arriving at the unit has helped equip me with the **skills** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

The Unit Type Code (UTC) training I have received since arriving at the unit has helped equip me with the **abilities** needed to succeed in my job in a combat communications unit

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Unit Type Code training needs to change, to help make new Airmen more effective in their role as a combat communicator

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Please provide additional comments in the box below

Please provide any other comments you may have concerning the Unit Type Code (UTC) training you have received since arriving at the unit, as it applies to your ability to succeed as a member in a combat communications unit

Job Competency Questions

I feel confident that if I left tomorrow, I could successfully complete a combat communications deployment with no one else from my AFSC along to help me.

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree

Please provide additional comments in the box below

To be truly effective in a combat communications unit, I feel that it takes about this long to become confident and comfortable to operate the equipment independently, or on my own with little to no help from others.

- ◯ 1 to 3 months
- ◯ 3 to 6 months
- ◯ 6 months to 1 year
- ◯ 1 to 2 years
- ◯ More than 2 years

Please add any other comments you may have in the box below

Please provide any other comments you may have concerning how long it takes to build a cyberspace operator that is capable of operating independently in a combat communications unit.

Career Field Merger Questions

The following section asks a set of similar questions, differentiated by knowledge, skills, and abilities.

Definitions:

Knowledge, Skills, and Abilities (KSAs) are the attributes required to perform work roles and are generally demonstrated through relevant experience, education, or training.

Knowledge is a body of information applied directly to the performance of a function.

Skill is often defined as an observable competence to perform a learned psychomotor act. Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. In certain cyberspace career fields, skills may also involve applying tools, frameworks, processes, and controls that have an impact on the cyber posture of an organization or individual.

Ability is competence to perform an observable behavior or a behavior that results in an observable product.

I feel that the 3DXXX career field merger in 2009 negatively affected the quality of the on-the-job training that I can provide to my subordinates.

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

I feel that the 3DXXX career field merger in 2009 negatively affected the quality of the on-the-job training that I receive from my superiors.

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

Since merging into my 3DXXX career field in 2009, I feel that the Air Force has done enough to properly equip me with the right technical **knowledge** to succeed in my AFSC as a technician and as a supervisor

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

Since merging into my 3DXXX career field in 2009, I feel that the Air Force has done enough to properly equip me with the right technical **skills** to succeed in my AFSC as a technician and as a supervisor

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

Since merging into my 3DXXX career field in 2009, I feel that the Air Force has done enough to properly equip me with the right technical **abilities** to succeed in my AFSC as a technician and as a supervisor

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Neutral
- ◯ Agree
- ◯ Strongly Agree
- ◯ N/A

Please provide any other comments you may have concerning the 2009 3DXXX career field merger, as it applies to your ability to succeed as a technician, trainer, and supervisor in a combat communications unit

Final Comments

ns training.

Appendix B

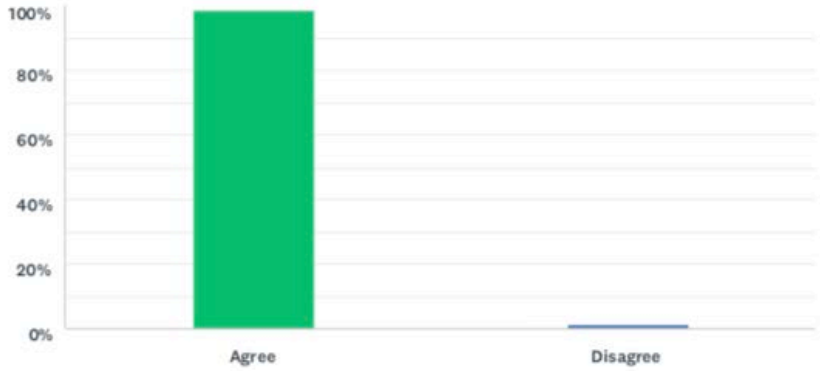
Survey Responses

Q1 ELECTRONIC CONSENT: By selecting AGREE, you consent that:

- You have read and understand the information above regarding this study;
- You are voluntarily agreeing to participate in this study and understand that you can opt out at any time without penalty; and
- You are at least 18 years of age.By selecting DISAGREE, you do not wish to participate in the research study, and may exit your browser.

Please select your choice below:

Answered: 67 Skipped: 0

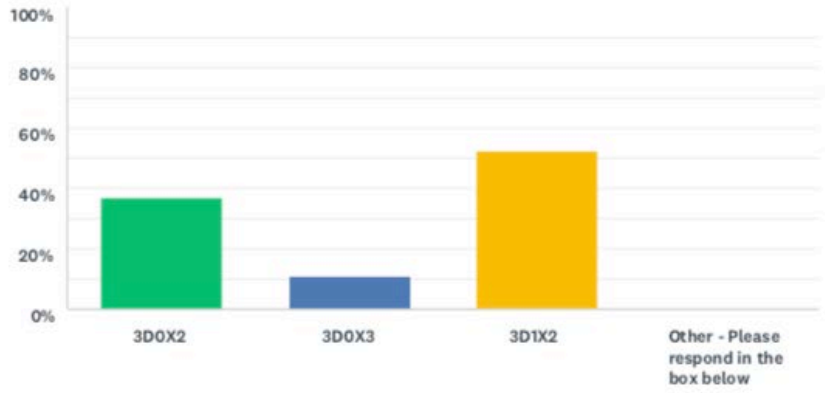


ANSWER CHOICES	RESPONSES	
Agree (1)	98.51%	66
Disagree (2)	1.49%	1
TOTAL		67

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.01	0.12

Q2 What is your AFSC?

Answered: 65 Skipped: 2



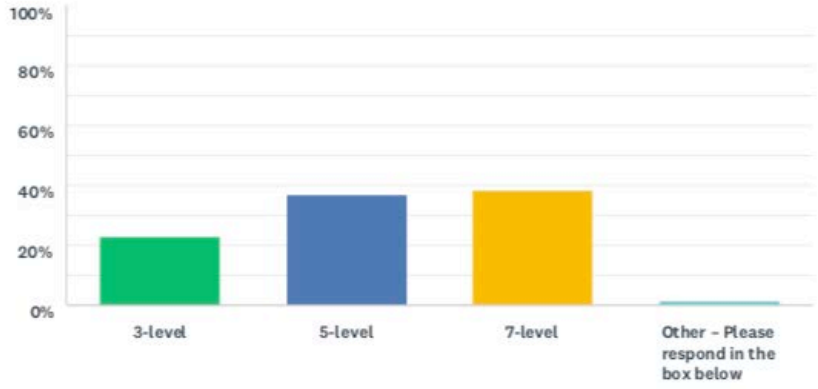
ANSWER CHOICES	RESPONSES	
3D0X2 (1)	36.92%	24
3D0X3 (2)	10.77%	7
3D1X2 (3)	52.31%	34
Other - Please respond in the box below (4)	0.00%	0
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	3.00	2.15	0.93

#	OTHER - PLEASE RESPOND IN THE BOX BELOW	DATE
	There are no responses.	

Q3 What is your AFSC skill level?

Answered: 65 Skipped: 2



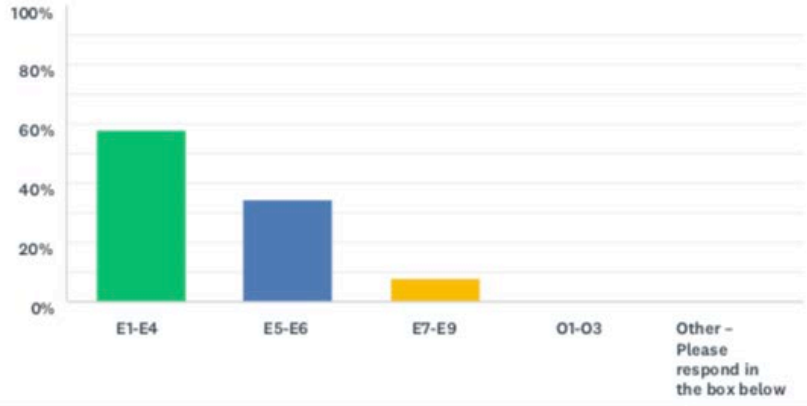
ANSWER CHOICES	RESPONSES	
3-level (1)	23.08%	15
5-level (2)	36.92%	24
7-level (3)	38.46%	25
Other – Please respond in the box below (4)	1.54%	1
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	2.00	2.18	0.80

#	OTHER – PLEASE RESPOND IN THE BOX BELOW	DATE
1	9-level	5/29/2018 11:46 AM

Q4 What is your rank?

Answered: 64 Skipped: 3



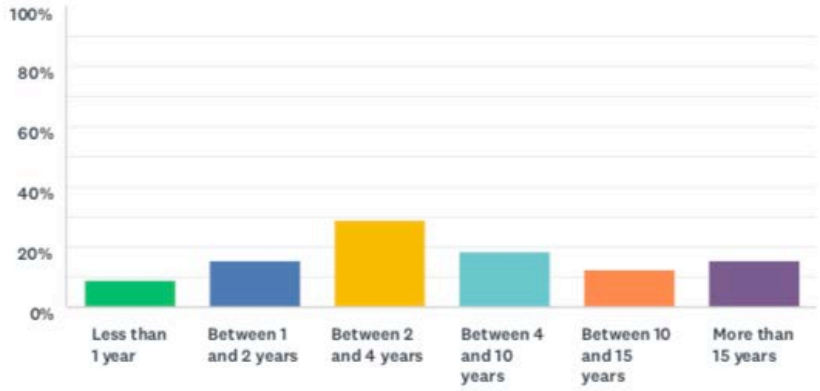
ANSWER CHOICES	RESPONSES	
E1-E4 (1)	57.81%	37
E5-E6 (2)	34.38%	22
E7-E9 (3)	7.81%	5
O1-O3 (4)	0.00%	0
Other – Please respond in the box below (5)	0.00%	0
TOTAL		64

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	1.00	1.50	0.64

#	OTHER – PLEASE RESPOND IN THE BOX BELOW	DATE
	There are no responses.	

Q5 How many years of active duty service have you served?

Answered: 65 Skipped: 2

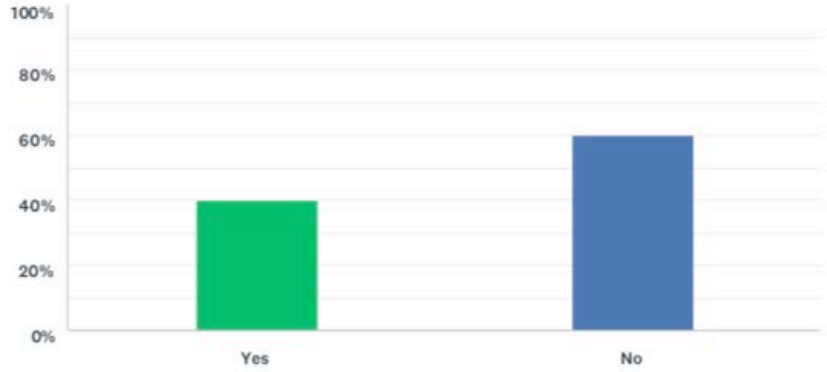


ANSWER CHOICES	RESPONSES	
Less than 1 year (1)	9.23%	6
Between 1 and 2 years (2)	15.38%	10
Between 2 and 4 years (3)	29.23%	19
Between 4 and 10 years (4)	18.46%	12
Between 10 and 15 years (5)	12.31%	8
More than 15 years (6)	15.38%	10
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	3.00	3.55	1.51

Q6 Are you a supervisor?

Answered: 65 Skipped: 2

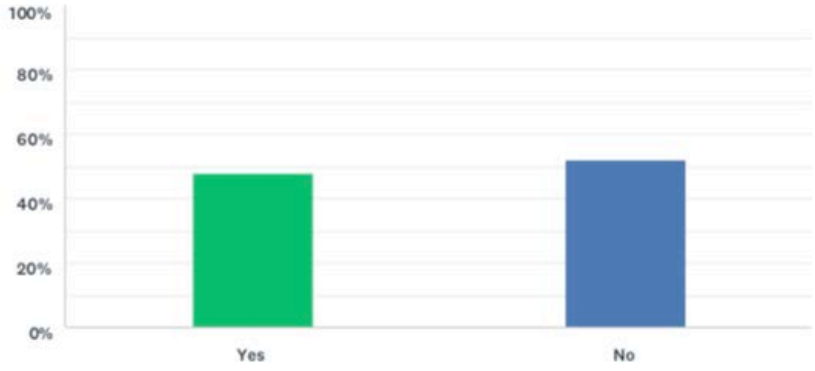


ANSWER CHOICES	RESPONSES	
Yes (1)	40.00%	26
No (2)	60.00%	39
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.60	0.49

Q7 Are you formally charged with training others on upgrade training?

Answered: 65 Skipped: 2

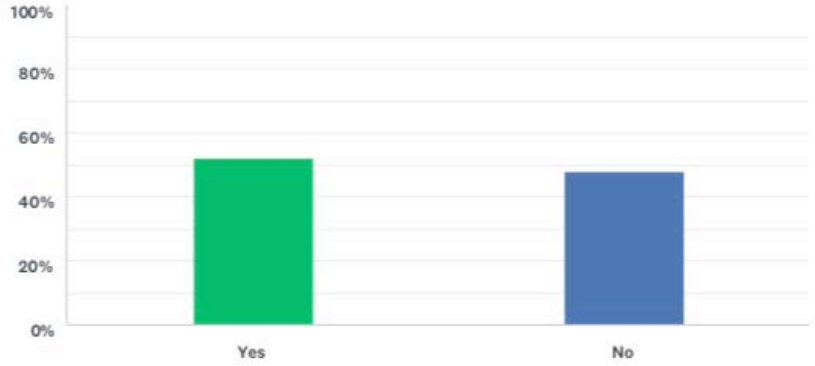


ANSWER CHOICES	RESPONSES	
Yes (1)	47.69%	31
No (2)	52.31%	34
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.52	0.50

Q8 Are you formally charged with training others on on-the-job-training?

Answered: 65 Skipped: 2

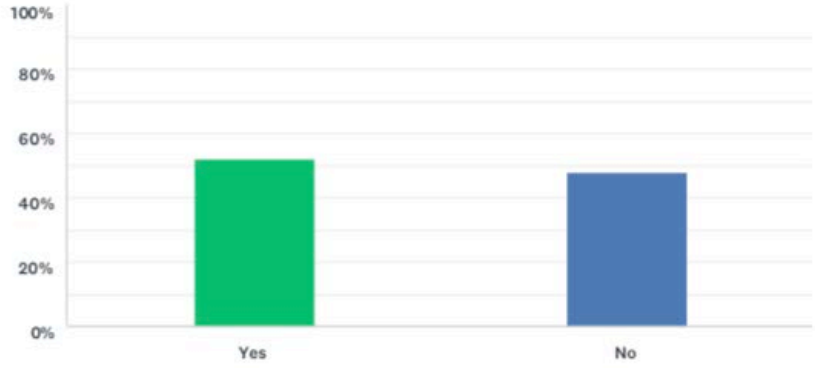


ANSWER CHOICES	RESPONSES	
Yes (1)	52.31%	34
No (2)	47.69%	31
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.48	0.50

Q9 Are you formally charged with training others on Unit Type Code (UTC) training?

Answered: 65 Skipped: 2

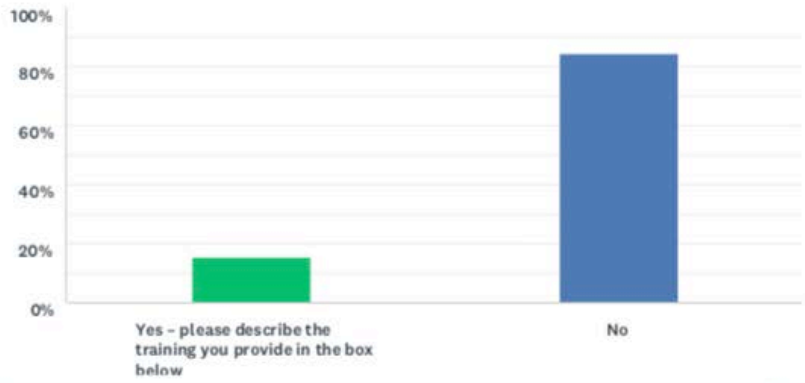


ANSWER CHOICES	RESPONSES	
Yes (1)	52.31%	34
No (2)	47.69%	31
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.48	0.50

Q10 Are you formally charged with training others on any other kind of training?

Answered: 64 Skipped: 3



ANSWER CHOICES	RESPONSES	
Yes – please describe the training you provide in the box below (1)	15.63%	10
No (2)	84.38%	54
TOTAL		64

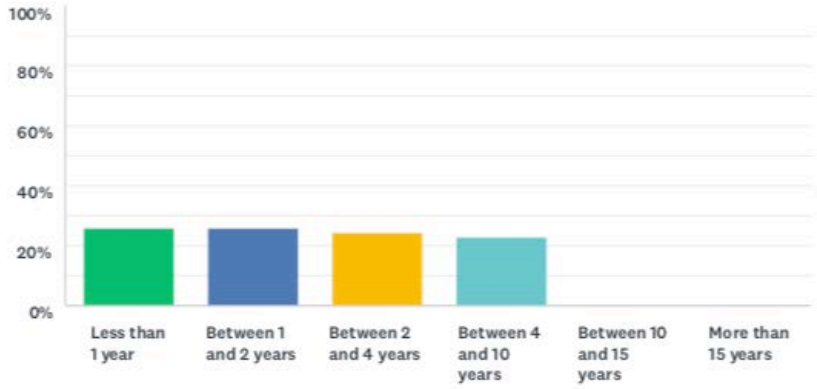
BASIC STATISTICS

Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.84	0.36

#	PLEASE DESCRIBE THE TRAINING YOU PROVIDE	DATE
1	All the OJT and tasks	6/1/2018 10:15 AM
2	Day to day processes and forklift operations.	6/1/2018 9:05 AM
3	I am charged with training and guiding NCOs on their duties as supervisors as well as teaching them how to become effective leaders and managers.	6/1/2018 2:19 AM
4	Vehicle training, additional duty training, etc	5/31/2018 1:25 PM
5	I am qualified to train on both the LMTV and the Polaris	5/31/2018 1:07 PM
6	IMDS	5/31/2018 12:40 PM
7	Being a great airman, following the Air Force core values.	5/31/2018 8:27 AM
8	COMSEC Training	5/29/2018 7:44 AM
9	just arrived, haven't really been changed with providing any training yet, i'm not spun up on any of the equipment to provide any training as of now.	5/24/2018 3:14 PM
10	SABC	5/24/2018 2:17 PM
11	Not at this time because I recently retrained	5/24/2018 1:30 PM
12	NCC-D sustainment training. Use of AtHOC, WSUS, Solarwinds , Wireshark and Managing end users devices.	5/24/2018 11:50 AM
13	Basic COMSEC training for the unit's users for 3 workcenters	5/22/2018 12:17 AM

Q11 How many years have you served in a combat communications unit?

Answered: 65 Skipped: 2

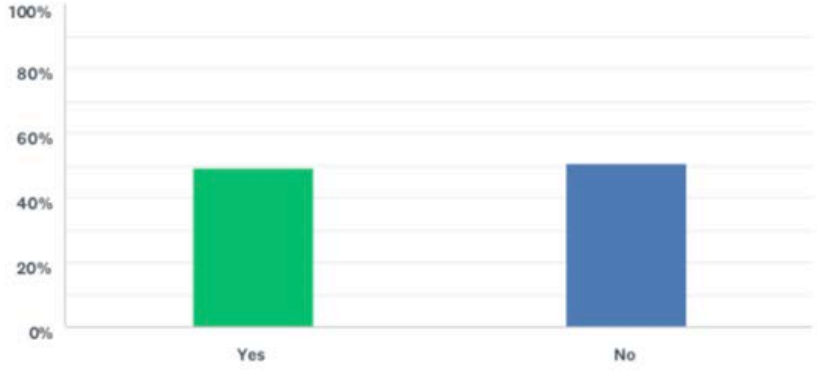


ANSWER CHOICES	RESPONSES	
Less than 1 year (1)	26.15%	17
Between 1 and 2 years (2)	26.15%	17
Between 2 and 4 years (3)	24.62%	16
Between 4 and 10 years (4)	23.08%	15
Between 10 and 15 years (5)	0.00%	0
More than 15 years (6)	0.00%	0
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	2.00	2.45	1.11

Q12 Have you ever deployed with a combat communications unit?

Answered: 65 Skipped: 2

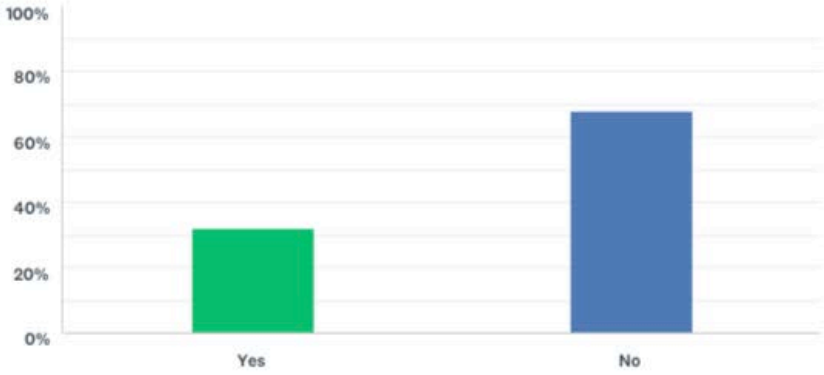


ANSWER CHOICES	RESPONSES	
Yes (1)	49.23%	32
No (2)	50.77%	33
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.51	0.50

Q13 Have you ever served in a unit other than combat communications?

Answered: 65 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes (1)	32.31%	21
No (2)	67.69%	44
TOTAL		65

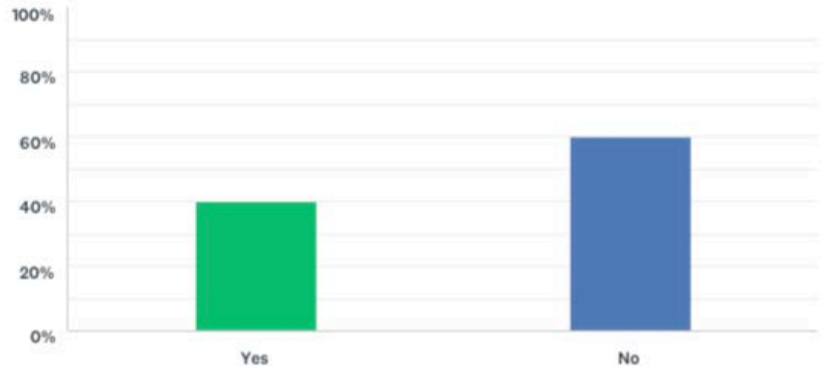
BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.68	0.47

#	PLEASE LIST OTHER TYPES OF UNITS YOU HAVE SERVED WITH, BUT DO NOT LIST THE UNIT SPECIFICALLY (I.E., "BASE COMM" OR "ASOS" IS ACCEPTABLE, BUT "THE 9TH CS" IS NOT.	DATE
1	Research Lab, intelligence squadron, NOSC	6/1/2018 10:24 AM
2	ACOMS	6/1/2018 10:20 AM
3	5th Mob the entire time	6/1/2018 10:17 AM
4	AFCENT Base Comm	6/1/2018 9:05 AM
5	Base comm	6/1/2018 8:59 AM
6	Base Comm JSOTF Special Operations	6/1/2018 8:09 AM
7	Base Comm IS AOC MCCS	6/1/2018 2:52 AM
8	Base Comm Green Door	6/1/2018 2:19 AM
9	mobile Comm unit	5/31/2018 12:41 PM
10	BMT, AF Tech School at Keesler, AFB.	5/31/2018 8:27 AM
11	Base Comm, Intel Support	5/30/2018 9:46 AM
12	Varying tiers of base comms.	5/29/2018 11:46 AM
13	AFMC, AMC, PACAF (base comms)	5/29/2018 10:00 AM
14	ACS	5/29/2018 7:44 AM
15	base comm ACS Instructor Missile Comm Telephone expeditionary comm	5/24/2018 3:14 PM
16	Base Comm Support Squadron	5/24/2018 1:30 PM

17	608th ACOMS - AOC 693 ISS - DCGS (DGS-4) Kandahar, AG - Gorgon Stare PED EUCOM Partnership Integration Enterprise (EPIE) - USAFE A6/1 ACOS 92 ARW 92 ARS 92 AMXS	5/24/2018 11:50 AM
18	Base Comm	5/24/2018 10:00 AM
19	ASOS base level support Combat Comm. Flight	5/22/2018 11:53 AM
20	base comm, intel squadron	5/22/2018 9:53 AM
21	ACS, ASOS	5/22/2018 9:36 AM
22	Varying support tiers of base communications.	5/22/2018 8:34 AM
23	Base Comm Operations Support Sq USSTRATCOM/J6	5/22/2018 12:17 AM

Q14 Have you ever deployed with a non-combat communications unit?

Answered: 65 Skipped: 2

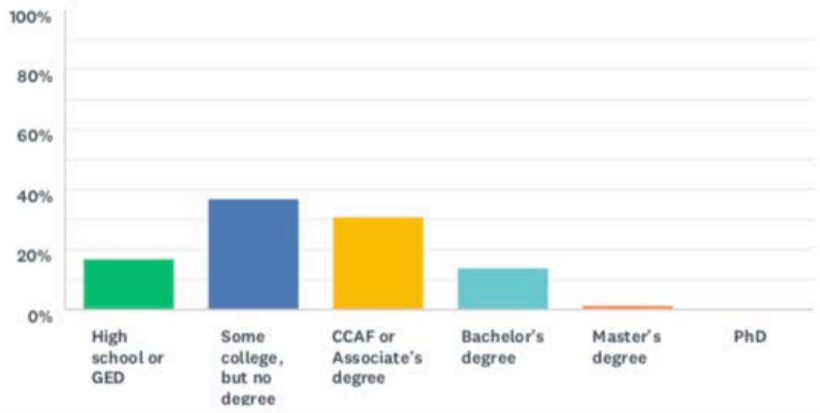


ANSWER CHOICES	RESPONSES	
Yes (1)	40.00%	26
No (2)	60.00%	39
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.60	0.49

Q15 Please select your highest level of formal academic education

Answered: 65 Skipped: 2

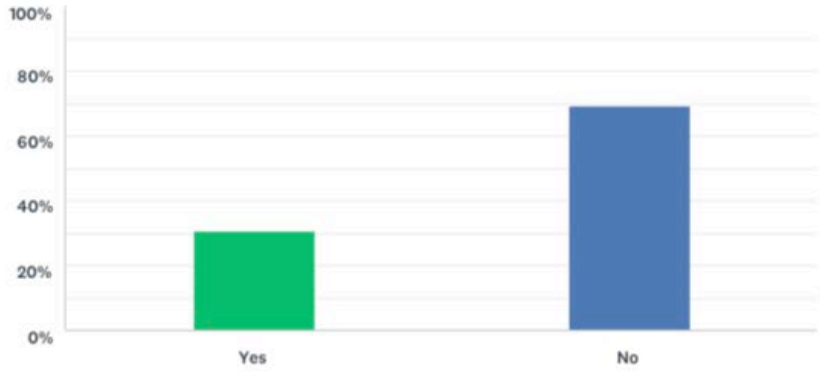


ANSWER CHOICES	RESPONSES	
High school or GED (1)	16.92%	11
Some college, but no degree (2)	36.92%	24
CCAF or Associate's degree (3)	30.77%	20
Bachelor's degree (4)	13.85%	9
Master's degree (5)	1.54%	1
PhD (6)	0.00%	0
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.46	0.98

Q16 Did your assigned career field change as a result of the 2009 3DXXX career field merger?

Answered: 65 Skipped: 2

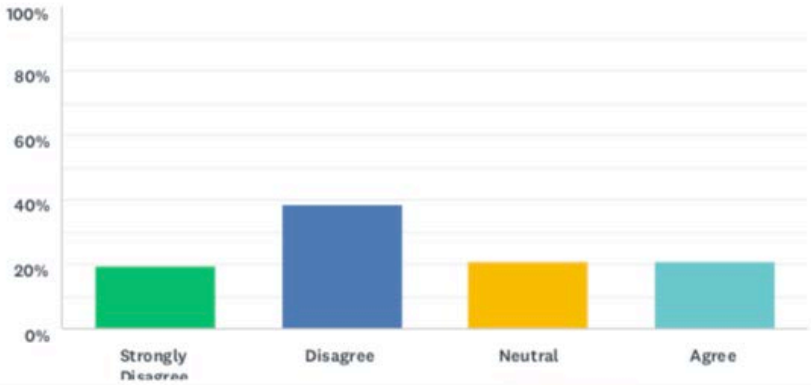


ANSWER CHOICES	RESPONSES	
Yes (1)	30.77%	20
No (2)	69.23%	45
TOTAL		65

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.69	0.46

Q17 Technical school equipped me with the right technical knowledge to succeed in a combat communications unit

Answered: 63 Skipped: 4

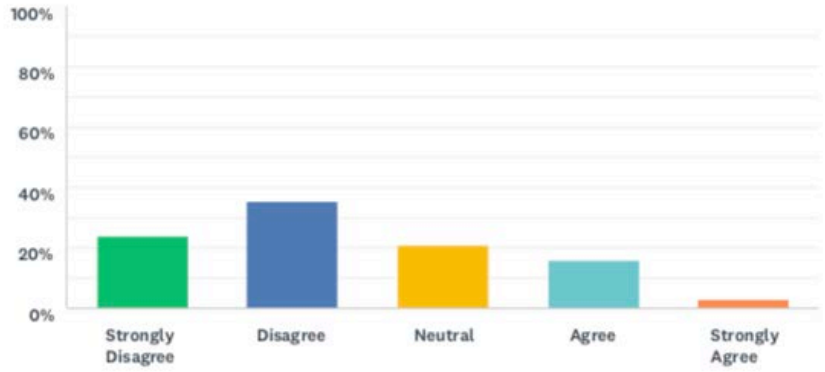


ANSWER CHOICES	RESPONSES	
Strongly Disagree	19.35%	12
Disagree	38.71%	24
Neutral	20.97%	13
Agree	20.97%	13
TOTAL		62

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.48	1.07

Q18 Technical school equipped me with the right technical skills to succeed in a combat communications unit

Answered: 62 Skipped: 5

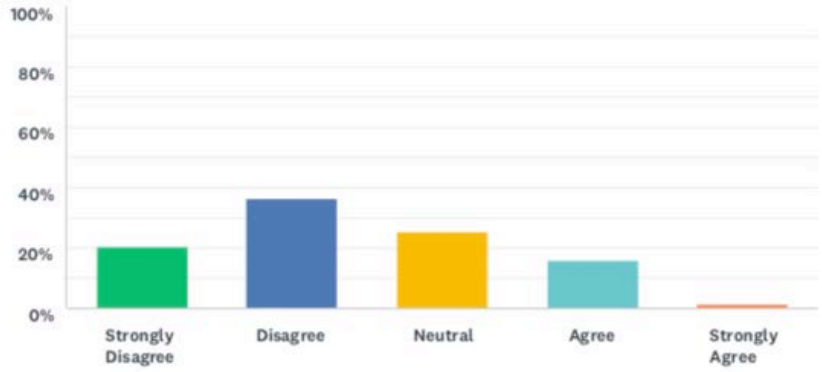


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	24.19%	15
Disagree (2)	35.48%	22
Neutral (3)	20.97%	13
Agree (4)	16.13%	10
Strongly Agree (5)	3.23%	2
TOTAL		62

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.39	1.11

Q19 Technical school equipped me with the right abilities to succeed in a combat communications unit

Answered: 63 Skipped: 4

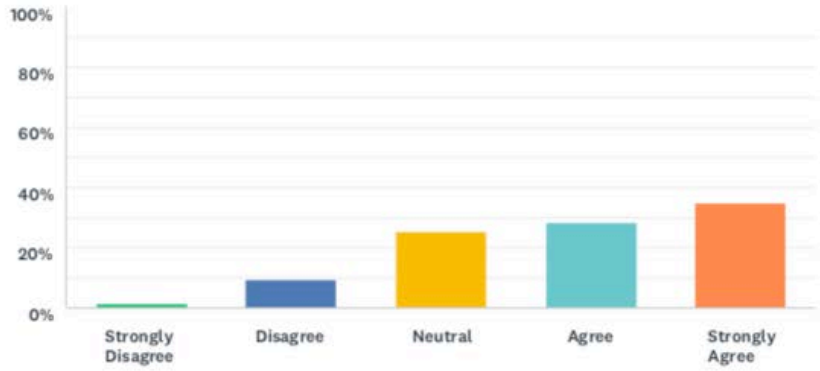


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	20.63%	13
Disagree (2)	36.51%	23
Neutral (3)	25.40%	16
Agree (4)	15.87%	10
Strongly Agree (5)	1.59%	1
TOTAL		63

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.41	1.03

Q20 Technical school needs to change, to help make new cyberspace/telecommunications Airmen more effective at their first duty station

Answered: 63 Skipped: 4



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	1.59%	1
Disagree (2)	9.52%	6
Neutral (3)	25.40%	16
Agree (4)	28.57%	18
Strongly Agree (5)	34.92%	22
TOTAL		63

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	4.00	3.86	1.05

#	PLEASE PROVIDE ADDITIONAL COMMENTS CONCERNING HOW TECHNICAL SCHOOL SHOULD CHANGE TO HELP MAKE NEW CYBERSPACE/TELECOMMUNICATIONS AIRMEN MORE EFFECTIVE AT THEIR FIRST DUTY STATION IN THE BOX BELOW	DATE
1	The scope of 3D0X3's duties in combat comm are very narrow, and the first block of tech school is completely irrelevant to how I work in Combat Comm	6/2/2018 6:58 AM
2	Combat Comm should not be a first duty station, it should be a Special Duty Assignment.	6/1/2018 4:38 PM
3	I can only speak on Combat Comm, but I feel that if you belong to the sector of combat comm you need to know the whole gambit. We as a 3d0X3, need to know how to be effective on a firewall ,proxy , ACAS,HBSS, Domain controllers ,fileservers , exchange servers, Solar winds, ATHOC. In tech school ,we primarily went over how to add users to active directory and how to load pre-built Virtual Machines. I think that if you are going to combat comm , you are not going to be useful as a technician until you have a small grasp on all of the above areas. I am 2+ years in and feel that I am proficient in most of them but not all.	6/1/2018 11:12 AM
4	Training should be based off of what type of unit they are going to. For example you do different things in a Combat Comm than a Base Comm.	6/1/2018 10:36 AM

5	Most of the skill taught in technical training is not relevant to the combat communications domain. Some of the skills are relevant to duty assignments. Also, note that the curriculum has changed since my training.	6/1/2018 10:25 AM
6	Several blocks in Tech School are highly irrelevant or seemingly random. The SQL block is unnecessary. We barely even knew what a combat communications unit was. Time spent actually teaching the Sec+ block instead of teaching memorization would be most beneficial. Instead, trainees leave with loose concepts and irrelevant labs.	6/1/2018 10:19 AM
7	I've never been a part of any other unit, so I can't speak for them. For this unit, tech school prepared me for nothing. Like at all. I learned everything from scratch here.	6/1/2018 10:16 AM
8	I think they should implement more hands on training in blocks 3 and 4 and also the security plus class should be longer than 10 days.	6/1/2018 9:50 AM
9	I believe base comm or similar operations makes up the large majority of potential assignments for our career field. Technical school is tailored for that. Considering how an airman's first duty station is not certain or set in stone prior to the start of technical school, it makes sense for technical school to train airmen in the generalizable knowledge and skills that apply to all assignments, plus some that would apply to the vast majority of assignments. While technical school lacks some of the essential skills training that would be needed in combat communications, I believe it makes sense for Combat Comm units to implement any further training needed after receiving airmen from technical school. The equipment and skills involved in combat communications can vary between CC units and are subject to change. When training is devolved to the individual CC units rather than implemented at a higher level such as tech school, I believe it allows for more flexibility and adaptability of the training program to that particular unit's needs.	6/1/2018 9:20 AM
10	Technical school needs to change in a way that tailors to the new Airmen going to a combat comm. As of now, the training provided may be sufficient for base comm Airmen but barely scratches the surface for what a combat communicator is expected to be proficient in when arriving to a combat comm unit. However, a more sufficient way for combat comm Airmen to be trained, is to have a specific training course provided to all incoming Airmen that tailors to what combat comm demands. Such as the Savannah training. (No such training was provided to me when I arrived a year and a half ago.)	6/1/2018 9:17 AM
11	Technical school needs to change as there are too many types of equipment that Airmen are tasked with working on to be proficient on all of it. Within my career field there is an ever expanding amount of equipment to be worked on and it is not possible to be effective and efficient with the broad scope of equipment possibilities and combinations. Every situation needs to be approached differently and our Airmen need to be taught to think dynamically rather than statically. If we are to overcome the ever changing battlefield expectations, technical school must not be stuck in the past but rather continue looking to the horizon for the next challenge.	6/1/2018 2:37 AM
12	The idea of a technical school is to get you a basic understanding in your career field. That is why we have upgrade and OTJ training. In the 3D1X2 career field there is such a wide variety of things we can do at a base that there is no way to train everyone to be the best at everything rather than give them the basic knowledge and understanding.	6/1/2018 1:05 AM
13	Any instructor who ever told me that I was going to/ not going to use something in my job was wrong, aside from the instructors who said I was going to need to know how to subnet. Never in tech school did we learn what a slice is, or how to configure phones, aside from Cisco VoIP phones, or using 66 and 110 blocks for PoTS phones, where here, we use neither methods. At tech school, we learned the functions of a PBX, but never how to configure one, which is all we do here in regards to voice. If tech school wishes to stay relevant, they need to keep up with equipment that we use. An alternate option to this is to have some 3D1X2's come in knowing that they are going to be combat comm early on, and send them to a slightly different school, or an additional school afterwards to train on equipment and learn techniques that are used mainly in the combat comm scene.	5/31/2018 3:40 PM
14	More emphasis on troubleshooting, less on xlsx queries and SQL	5/31/2018 2:38 PM
15	Less emphasis on specific knowledge for 3D0x2, such as subnetting for a week, labs to learn how to query an xlsx file, etc., and more emphasis on troubleshooting and inter-relationships between subsystems, such as active directory's impact on security.	5/31/2018 2:26 PM
16	Technical school still instructs on outdated equipment. However, the concepts are similar to newer equipment.	5/31/2018 1:28 PM
17	A better understanding of network fundamentals needs to be installed in the training at tech school.	5/31/2018 12:42 PM

18	Most of the equipment used in combat communications squadrons are not available for training during tech school.	5/31/2018 10:53 AM
19	N/A	5/31/2018 8:31 AM
20	Combat Communications require equipment employment not used by the greater air force to such an extent that we need to specifically cater to our community in tech school	5/31/2018 8:24 AM
21	more hands on training rather than watching slides in class and reading about it in books	5/29/2018 1:03 PM
22	OJT in the schoolhouse	5/29/2018 7:44 AM
23	tech school is very basic and most of the tasks are taught to an "A" level (Basic definitions) and some minor hands on tasks. Tech school is broad training that gives an overview of networking and infrastructure concepts and some hands on switch/router/telephony configuration. Tech school doesn't go into as much detail as someone would need to configure equipment at their first duty station, but it's not really meant to either. More specialized training would need to occur to add to their expertise to be mission effective.	5/24/2018 3:18 PM
24	Depends on the individual's first duty station. From a Combat Comm perspective, there should be extra course in technical training that cover our job requirements (technical) more in depth.	5/24/2018 2:19 PM
25	For airman who are stationed at a non-combat communications unit, the training received from tech school would be adequate to be successful. However, the level of training required to be a competent technician at a combat communications squadron is much higher than the level of skills you receive at tech school.	5/24/2018 1:33 PM
26	I think the training was a good introduction into the career field. Without it new airmen would be very lost.	5/24/2018 1:32 PM
27	Provide follow on course for individuals going to Combat Comm as they do for special weapon systems ex DCGS and AOC. Provide more training on cisco devices. Provide full mission sustainment training on managing and using other servers. Once initial/config training is accomplished on the system you will managing focus on sustainment, securing and defending the network.	5/24/2018 11:57 AM
28	The current technical school does not cover tactical communications. I would recommend a shred out to focus solely on tactical environment. This should be a mandatory school / training that each member would need to attend.	5/24/2018 10:05 AM
29	It depends on the Airmen's first duty station as some require more knowledge and skills than others do.	5/23/2018 9:23 AM
30	It depends on the Airmen's first duty station.	5/23/2018 9:09 AM
31	I feel that Technical school needs to be more hands on and more dealing with equipment then PowerPoint slides, All my skills and knowledge was yes "handed" to me but there was no motivation what so ever or encouragement by any of the teachers/leaders that where besides like 2 of the of the staff. I get its hard to manage a constant flow or new Airmen coming into the Wolds greatest Air Force but how do you expect Great Airman without Great Teachers?	5/22/2018 3:29 PM
32	As an 3D0X3, my technical school was very short. I felt very unprepared when I arrived on station. I wish they would have dove a bit more deeply in the things we do.	5/22/2018 12:50 PM
33	Tech school gives Airman a decent understand of our career field, due to being assigned to a combat communications squadron is seen as somewhat rare in our career field. With that statement it would be ridiculous for them to add in other qualifications to the specific CCS.	5/22/2018 12:37 PM
34	I learned about Promina's in tech school. That shows you how out dated the material theyre trying to teach you. 70% of my job while deployed has been to fix cables and troubleshoot fiber and we hardly touch on it. We spent about 2 hours making cat-5 cables. Maybe we should spend more time on that	5/22/2018 12:26 PM
35	I disagree because I feel like there is/was a rush to judgement with the "new" thinking of telecom in the Air Force. The Civil Engineering branch tried this same direction with their Air Force members; they tried turning all of their enlisted positions to contractors or civilians so that their enlisted people could support mobile/tactical or Red Horse units. Eventually they found a nice median of civilians, contractors, and enlisted in CE at the base level. I feel this would be the same for the Cyberspace branch of the Air Force. There is no reason that it should be a "new way of thinking" in the technical schoolhouses.	5/22/2018 12:04 PM

36	More hands on learning of stacks and actual equipment that is used in a Combat Communications Unit	5/22/2018 9:49 AM
37	Technical school should provide continuation training that's specific to Airmen that will be assigned to combat communications units. The learning curve in this environment is huge so Airmen arriving with at least a foundation of TDC equipment would be extremely useful.	5/22/2018 9:44 AM
38	I believe tech school provides the core fundamentals to function is an Airman primary AFSC. However if the Airman's first duty station is a Combat Communications unit, additional training is required to needs to be accomplished before arriving on station. Due to manning constraints on a comm package, Airman tend to operate at the legacy 3C0X1 AFSC where he or she would specialize in a large spectrum on the current 3D AFSCs.	5/22/2018 12:24 AM

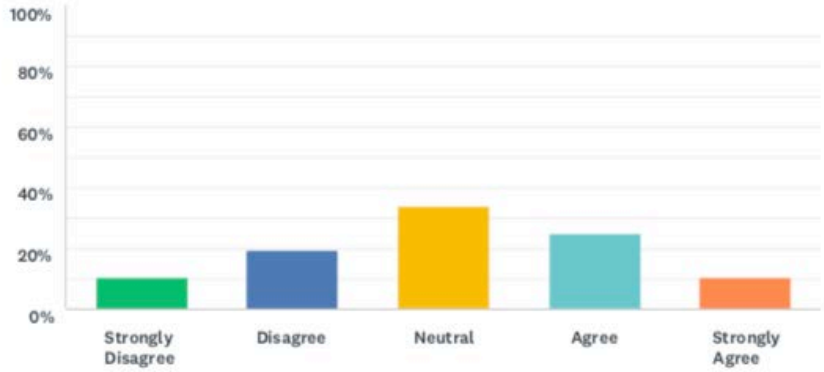
Q21 Please provide any other comments you may have concerning the training you received at technical school, as it applies to your ability to succeed as a member in a combat communications unit

Answered: 18 Skipped: 49

#	RESPONSES	DATE
1	Needs to be more advanced. New airmen have no idea what they are doing.	6/1/2018 4:54 PM
2	There was some useful things but majority of what we learned there doesn't apply to use with a Combat comm.	6/1/2018 10:36 AM
3	Not helpful.	6/1/2018 10:19 AM
4	Technical school definitely does not teach all the skills needed to succeed in Combat Communications, but it does provide much of the knowledge and ability to be able to acquire those skills once we are trained on them. It provides a good foundation, but not much more than the foundation.	6/1/2018 9:20 AM
5	NA	6/1/2018 2:37 AM
6	Learning of basic subnetting was very useful, and learning about different types of topographies was also useful. Most other things done in tech school were pretty pointless. Maybe for the sake of familiarity with similar equipment, it can almost be justified, but not very convincingly.	5/31/2018 3:40 PM
7	They need to teach the basics better and spend more time on computer fundamentals/networking as well as telecommunications and RF princriples.	5/31/2018 3:16 PM
8	Tech school provided the very basics of routing and switching, but no HDX or SLICE voice training, no RFK training, and no training on a live SIPR network.	5/31/2018 10:53 AM
9	Technical school taught the very basics about the job as a member in a combat communications unit.	5/31/2018 8:31 AM
10	more training on the X2 side	5/29/2018 1:03 PM
11	Tech school does not cover TDC at all. No mention of TDC is covered in our CDC's what so ever.	5/24/2018 10:05 AM
12	Technical school provides the bare minimum as far as training for our AFSC is concerned and combat communications units require a much higher knowledge level.	5/23/2018 9:09 AM
13	Get better leaders for the school environment that way you can get better Airman with better motivation and attitudes.	5/22/2018 3:29 PM
14	The cyber schoolhouse for the 1B4s and the 17Ds have a tech school for their personnel. But then depending on what their track is or where they will be stationed they go TDY to the FTU to get specific training. This is exactly the way the communications side should be setup as well. We should have our technical training at Keesler and if we get put into a mobile comm. squadron then we should go TDY to Savannah.	5/22/2018 12:04 PM
15	Training is pretty generic when I went through tech school. I don't remember any UTC specific equipment.	5/22/2018 9:57 AM
16	Additional training in network fundamentals and how this would apply to systems connected with DISA. More hands on/simulation of troubleshooting in a bare base communications setup.	5/22/2018 9:44 AM
17	Although technical school has undoubtedly changed since I attended over a decade ago; the feedback I receive from newly arriving technicians is that there is MINIMAL to no training covering Theater Deployable communications.	5/22/2018 8:54 AM
18	My training was based on the old 3C0X1 AFSC where I was taught disciplines in the client systems, cyber operation, and cyber surety AFSCs.	5/22/2018 12:24 AM

Q22 My 8570-mandated industry certification (Security+) helped equip me with knowledge needed to succeed in my job in a combat communications unit

Answered: 56 Skipped: 11

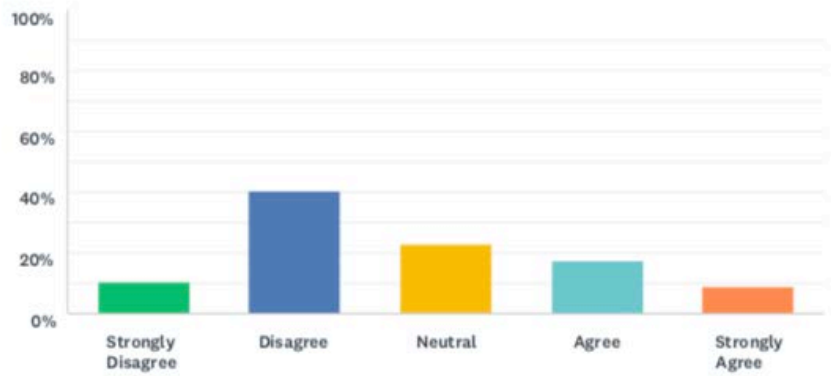


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	10.71%	6
Disagree (2)	19.64%	11
Neutral (3)	33.93%	19
Agree (4)	25.00%	14
Strongly Agree (5)	10.71%	6
TOTAL		56

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.05	1.14

Q23 My 8570-mandated industry certification (Security+) helped equip me with skills needed to succeed in my job in a combat communications unit

Answered: 57 Skipped: 10

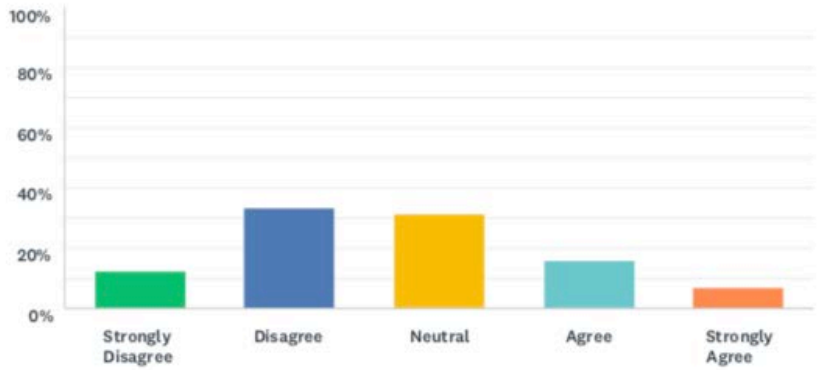


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	10.53%	6
Disagree (2)	40.35%	23
Neutral (3)	22.81%	13
Agree (4)	17.54%	10
Strongly Agree (5)	8.77%	5
TOTAL		57

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.74	1.13

Q24 My 8570-mandated industry certification (Security+) helped equip me with abilities needed to succeed in my job in a combat communications unit

Answered: 57 Skipped: 10

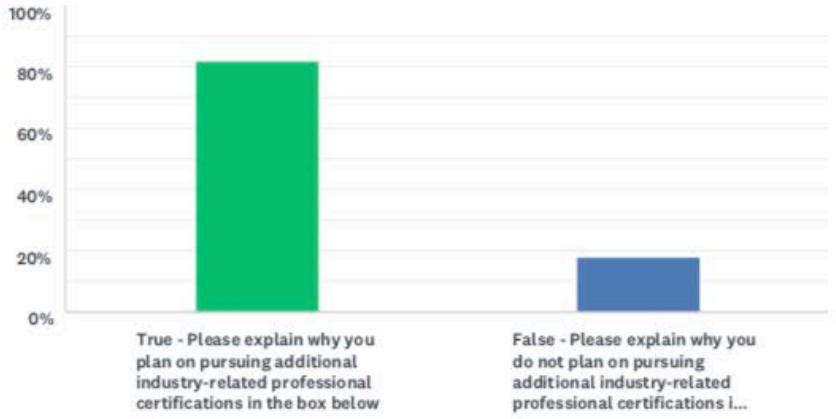


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	12.28%	7
Disagree (2)	33.33%	19
Neutral (3)	31.58%	18
Agree (4)	15.79%	9
Strongly Agree (5)	7.02%	4
TOTAL		57

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	2.72	1.09

Q25 I plan to pursue other professional certifications related to the information technology industry

Answered: 56 Skipped: 11



ANSWER CHOICES	RESPONSES	
True - Please explain why you plan on pursuing additional industry-related professional certifications in the box below (1)	82.14%	46
False - Please explain why you do not plan on pursuing additional industry-related professional certifications in the box below (2)	17.86%	10
TOTAL		56

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.18	0.38

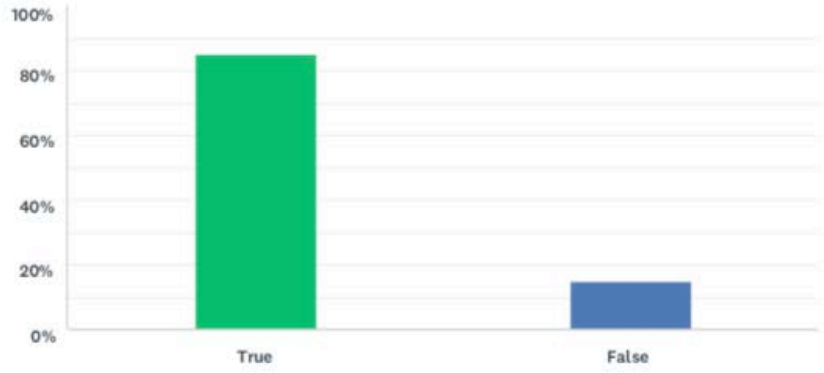
#	PLEASE ADD YOUR COMMENTS IN THE BOX BELOW	DATE
1	to expand my career options after I separate	6/2/2018 7:01 AM
2	I want to further my education for when I get out of the military as well as doing my best while I'm in. I plan to leave the 51st shortly after I put on E-4	6/1/2018 4:40 PM
3	I feel that sec+ is nice as far as looking in on a security aspect, but usually in the civilian sector it is taken by individuals with 2 years plus experience doing our job. Adding this stress on top of becoming a new airmen and moving to a new location is a lot to swallow and I don't think anyone is benefiting. I think most people are learning to pass sec + not to learn good security practices. I do want to take classes on PowerShell ,and linix as these are two areas that would help our job become more efficient.	6/1/2018 11:18 AM
4	In the civilian sector Security + is not held as a highly sought after certificate. A MS or CC are much more desirable.	6/1/2018 10:53 AM
5	Upon retirement I plan on continuing work in technological career's.	6/1/2018 10:39 AM
6	The market for Sec+ certified candidates has been flooded and the value of Sec+ is decreased. With so many members going through cram courses to satisfy 8570 requirements, it's widely known that they don't retain that knowledge and therefore the Sec+ cert has no value.	6/1/2018 10:31 AM
7	Sec+ is a good intro certificate, and I would like to pursue more to further my IT career. Every certificate above your current tier increases your value in the private sector.	6/1/2018 10:22 AM
8	I plan to cross train into a different career field	6/1/2018 9:53 AM

9	Studying for additional certifications will give me more knowledge and abilities to succeed in my career field both in and out of the military.	6/1/2018 9:27 AM
10	I plan on pursuing additional industry-related certifications in order to broaden scope for job opportunities on the civilian side.	6/1/2018 9:27 AM
11	It is the standard, and what employers are looking for.	6/1/2018 8:12 AM
12	I am currently studying the criteria to test for CISSP as this will better suit me for managing cyber minded environments. The CEU's I obtain every 3 years for SEC+ don't keep me informed about industry changing challenges well enough.	6/1/2018 2:44 AM
13	There is so much about networking to learn that it would only be beneficial to me to get more certifications and help prepare me for the civilian world in the long run	6/1/2018 1:08 AM
14	To further my knowledge in the my career field and to become more profitable.	6/1/2018 12:50 AM
15	CCNA and MCSA to broaden knowledge base	5/31/2018 2:45 PM
16	While a degree from an accredited university proves that one has the tenacity to finish a program and the ability to thoroughly research topics. Industry certifications prove ones competence in the certification field.	5/31/2018 1:38 PM
17	Unless made mandatory by USAF to remain current in Career field, no additional certs are needed for me. I do not plan to pursue a communications job after the military life, so I see additional certs unnecessary	5/31/2018 12:51 PM
18	It will benefit my future both inside the Air Force and outside the Air Force.	5/31/2018 10:56 AM
19	Desire to learn more information technology (IT) skills needed for the job in a combat communications unit.	5/31/2018 8:36 AM
20	Combat Communications experience is not deep enough to get the pay I want on the outside. Our networks are too simplistic, the focus isn't on sustainment, and a lot of our stuff doesn't have civilian application	5/31/2018 8:29 AM
21	Used to learn and become more marketable after separation from the military.	5/30/2018 9:50 AM
22	I am pursuing a degree in IT management and want to do more of the business side in IT so a cert wouldn't necessarily benefit me in a management role	5/29/2018 1:07 PM
23	Post Air Force	5/29/2018 7:45 AM
24	I wish to pursue this career long-term, inside and outside of the Air Force.	5/29/2018 7:15 AM
25	I have a few Cisco certs, and I'm pursuing a professional level Cisco cert at the moment.	5/24/2018 3:23 PM
26	I do not enjoy my career field or most aspects of the IT world. In a few months I will be completing a B.S. in my preferred field of study and will pursue that subject further after completion.	5/24/2018 2:22 PM
27	it can help me when it comes to transitioning in to the civilian side	5/24/2018 2:18 PM
28	Additional certifications would help me with my overall job knowledge and having them would greatly enhance my ability to pursue a job in this career field after the military.	5/24/2018 1:36 PM
29	I feel like in sec+ we were all just trrying to memorize enough material to pass the test bc we only have 2 weeks to prepare. With more time in a classroom setting I think it would be more beneficial.	5/24/2018 1:36 PM
30	I want to be a barber	5/24/2018 10:22 AM
31	CCNA would be a better choice for 3D1X2's for our sole job is routing and switching.	5/24/2018 10:13 AM
32	Marketability Versatility	5/23/2018 12:07 PM
33	The information technology industry does not interest me in the slightest.	5/23/2018 9:25 AM
34	The information technology industry does not interest me in the slightest.	5/23/2018 9:12 AM
35	Other certifications are required for the civilian world	5/22/2018 1:32 PM
36	I plan on pursuing other certs to help my career in the Air Force and outside of the Air Force.	5/22/2018 12:52 PM
37	So far I have not needed any qualification at all, Sec+ included with the materials that I have handled. I understand Sec+ is a good tool for us to be better trained while dealing with High Risk information, but so far it has not been needed.	5/22/2018 12:40 PM

38	Its a good career path but sec plus is pretty worthless for the IT industry.	5/22/2018 12:30 PM
39	CCNA IT Project Management	5/22/2018 12:10 PM
40	I have 2 cisco certifications and plan to go further down that path. I feel these certifications are more specific to my career field and provide a more in-depth dive into the career field.	5/22/2018 10:00 AM
41	I would like to pursue a degree in computer science	5/22/2018 9:55 AM
42	Becuase I want to go to school to be an RN and after that change my career field.	5/22/2018 9:55 AM
43	Additional security related training and certs such as CCIP and CISSP will be more beneficial for 3D0X2's. CCNA CCNP would be beneficial to 3D1X2's. Microsoft & McAfee certification training will assist will hardening our current networks.	5/22/2018 9:48 AM
44	As information technology professionals we must recognize the overlap between disciplines. The deeper into these intersecting disciplines an individual can dive, the more value they present to a team or organization. Obtaining pro certs is a method of demonstrating you are able to provide that level of value.	5/22/2018 9:11 AM
45	The Sec+ certification has lost its value over the years and only provide an entry-lvl baseline of the cyber security career progression.	5/22/2018 12:33 AM

Q26 There are better industry certifications available, which would make me more effective at my job, than those prescribe to me by my AFSC's 8570 requirement

Answered: 54 Skipped: 13



ANSWER CHOICES	RESPONSES	
True (1)	85.19%	46
False (2)	14.81%	8
TOTAL		54

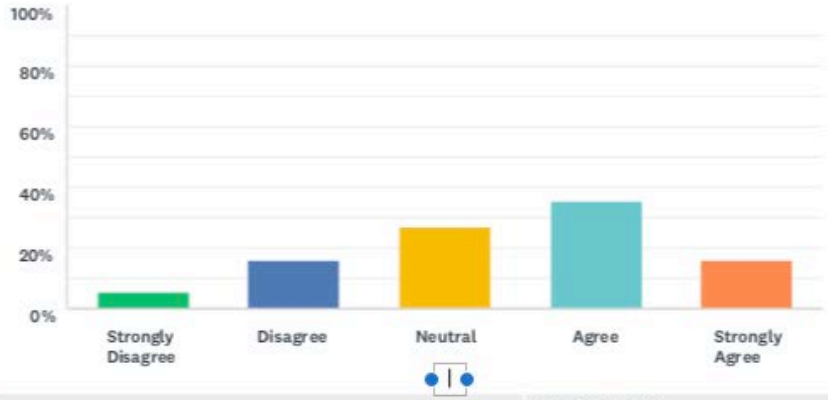
BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.15	0.36

#	PLEASE PROVIDE MORE DETAILS IN THE BOX BELOW	DATE
1	for Combat Comm's specific mission I cannot think of anything nessisary for 3D0X3s	6/2/2018 7:01 AM
2	VMWare	6/1/2018 4:56 PM
3	Server +	6/1/2018 4:40 PM
4	Security + is more relevant to AFSCs that deal primarily in cyber security. A Microsoft certification for 3D0X2s, and Cisco certification for 3D1X2s would be much more relevant to their carrier fields.	6/1/2018 10:53 AM
5	Sec+ only educates us on security related matters. Our job entails so much more than just security. We need to be familiar with the systems we work on to be able to secure them properly, and having technical certifications such as an MCSA (since we use mostly Microsoft servers) would be a great start.	6/1/2018 10:31 AM
6	Network + is a lesser certificate but teaches the fundamentals described and built off of in Sec+. It's akin to taking Spanish 3 without taking any previous Spanish. VMware Certificates would be perfect for Combat Comm Server Operators. They are Critical in our success.	6/1/2018 10:22 AM
7	Cisco certs, net+	6/1/2018 10:17 AM
8	I said false because there is not an "I don't know" option.	6/1/2018 9:27 AM
9	In my opinion, I don't believe there are BETTER industry certifications. However, there are several others (to include the 8570) that would help tremendously prepare us for a combat comm unit.	6/1/2018 9:27 AM
10	Cisco Certifications	6/1/2018 8:12 AM
11	Security+ CE does minimal to actually ensure that members are up to date with current threats.	6/1/2018 2:44 AM

12	CompTIA CYSA+ would be more suited for auditing and analyzing trends and provide skills necessary to respond to security incidents	5/31/2018 2:45 PM
13	Security+ is great for building a security mindset in an organization. However, in order to build a competent technician, career field specific certifications should be mandatory. For example, 3D1X2 should hold a minimum of CCNA and Network+. While 3D0X2 should hold at least Server+.	5/31/2018 1:38 PM
14	There may be better certs out there to set you up for success post-military but not necessary for the equipment we work on	5/31/2018 12:51 PM
15	CCNA Routing and Switching CCNA Security	5/31/2018 10:56 AM
16	A+, Network+, CISCO certifications such as CCNA, CCNP, CCIE, CEH certification, among several others.	5/31/2018 8:36 AM
17	CCNA Routing and Switching would probably be more effective, since our security is prescribed to us by block 60 and not actively monitored, but that's a higher level certification that would necessitate longer training time, and overall air force comm probably deals more with security.	5/31/2018 8:29 AM
18	There are more career specific training opportunities and certifications than just a generic Sec+ degree.	5/30/2018 9:50 AM
19	Ethical Hacker/CASP	5/29/2018 7:45 AM
20	CCNA	5/29/2018 7:15 AM
21	8570 requirements are a waste of Air Force money, I do not use that knowledge on a day to day basis since I've received it. Maintaining it is also a waste.	5/24/2018 3:23 PM
22	Cisco Certifications	5/24/2018 2:22 PM
23	Network+ would be a better certification as it pertains more directly to my job.	5/24/2018 1:36 PM
24	I have heard their are but I don't know personally.	5/24/2018 1:36 PM
25	A + CISSP CCNA Ethical Hacking	5/24/2018 12:00 PM
26	Net Plus has a higher pass rate and is more related to Cyber Transport	5/24/2018 10:22 AM
27	CCNA - Routing & Switching	5/24/2018 10:13 AM
28	CCNA	5/23/2018 12:07 PM
29	I am unsure.	5/23/2018 9:25 AM
30	CISSP	5/22/2018 1:13 PM
31	N/A	5/22/2018 12:52 PM
32	I feel as though an different qualification other than Sec+ could be implemented while still offering the same understanding of the information.	5/22/2018 12:40 PM
33	CCNA security would do the job 10 times better	5/22/2018 12:30 PM
34	I feel like the Cisco certs are much better and all-encompassing. However, they are much more expensive; like everything else it all comes down to money. The DOD was looking for a quick-fix blanket policy and now we are left with 8570 COMPTIA certs.	5/22/2018 12:10 PM
35	Additional security related training and certs such as CCIP and CISSP will be more beneficial for 3D0X2's. CCNA CCNP would be beneficial to 3D1X2's. Microsoft & McAfee certification training will assist will hardening our current networks.	5/22/2018 9:48 AM
36	Security+ is a baseline certification that proves a working knowledge of security functions within IT. As a 3D0X2, a technician is always concerned about security; however, primary job functions are not made more effective by focus on security. A more suitable certification for a 3D0X2 that is just as "affordable" and achievable as Security+ would be Server+.	5/22/2018 9:11 AM
37	There are a number of certifications that are identified in the different lvls of Information Assurance Managers. I think the Comptia CASP cert and CISSP would be beneficial to cyber surety (E-5 thru	5/22/2018 12:33 AM

Q27 Industry certifications needs to change, to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider

Answered: 56 Skipped: 11



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.36%	3
Disagree (2)	16.07%	9
Neutral (3)	26.79%	15
Agree (4)	35.71%	20
Strongly Agree (5)	16.07%	9
TOTAL		56

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	4.00	3.41	1.10

#	PLEASE PROVIDE ADDITIONAL COMMENTS IN THE BOX BELOW	DATE
1	Sec+ is not relevant to the work I've done in the mob so far	6/2/2018 7:01 AM
2	The certifications are not the issue. The certifications that we force everyone to obtain is the issue.	6/1/2018 10:53 AM
3	The industry certifications aren't the problem. Any cert picked to be the standard to meet 8570 is going to be diluted once cram session training begins.	6/1/2018 10:31 AM
4	Industry Certs aren't the problem. It's our access to them.	6/1/2018 10:22 AM
5	I really don't have enough knowledge about all the multitude of industry certifications that are out there to say one way or another.	6/1/2018 9:27 AM
6	We really need cisco certifications.	6/1/2018 8:12 AM
7	In my opinion certifications are not the answer to a much more complex issue. I believe we need more focused teams and members who can truly understand their craft rather than being a jack of many trades and a master of none.	6/1/2018 2:44 AM
8	Maybe have airmen test for certifications as part of skill level upgrade training, not washing them out for not mastering a 2 year experience recommended certification within the span of a 2 week study period	5/31/2018 2:45 PM

9	There are plenty of certifications and training to make very effective communications personnel. The Air Force and communication units need to pursue further certifications for their technicians. This will lead to technicians being masters of their trade versus cut-sheet technicians that cannot solve problems if it is not written down.	5/31/2018 1:38 PM
10	COMPTIA makes its certification exams very difficult, even for military members, each exam is set at a high cost making financially difficult to test.	5/31/2018 8:36 AM
11	Why would an industry certification need to be catered to such a small part of the military, specifically? We don't even get all our equipment from the same vendor.	5/31/2018 8:29 AM
12	There are more career specific training opportunities and certifications than just a generic Sec+ degree.	5/30/2018 9:50 AM
13	no the Air Force needs to change to modernize	5/24/2018 3:23 PM
14	Does the Industry need to change to meet the Air Force? Do the certs need to change to meet the Airmen? Or does the Air Force need to change to meet the Industry? Food for thought.	5/22/2018 12:10 PM
15	Going back to the previous comment, the Comptia Sec+ certification has lost its value over the years after becoming the de facto cert for a large number of 3DXXX AFSCs. Technical trainees are taught to pass the test and the practical use of this certification provide little to no value to the Airman that maintains it.	5/22/2018 12:33 AM

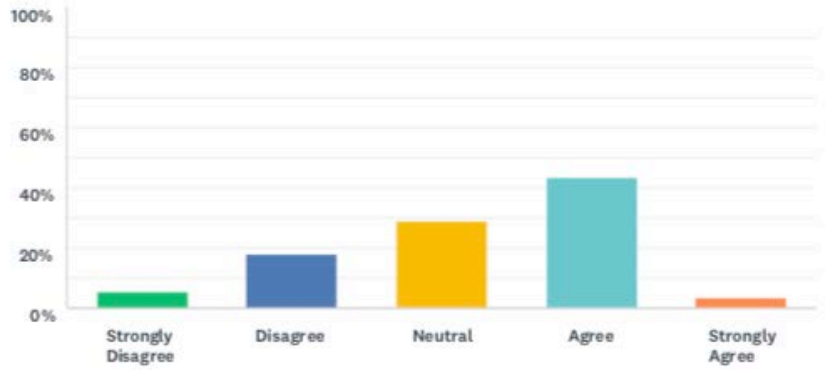
Q28 Please provide any other comments you may have concerning your 8570-mandated industry certification, as it applies to your ability to succeed as a member in a combat communications unit

Answered: 10 Skipped: 57

#	RESPONSES	DATE
1	The DoD as a whole needs to revaluate the forced certification program.	6/1/2018 10:53 AM
2	It provides the understanding to properly manage security on machines.	6/1/2018 10:39 AM
3	I feel that, whether or not I directly apply all of the knowledge from this certification on a daily basis, it at least serves as an effective filter for people who do not necessarily have a high aptitude for this career field. Many airmen can pass technical school, but fail out when they reach the Security+ examination. I have doubts that those who fail the exam would be highly effective in the career field.	6/1/2018 9:27 AM
4	8570 training does little for my career field in the combat communications unit.	6/1/2018 2:44 AM
5	N/A	5/31/2018 1:38 PM
6	I understand that the recertification process through CEUs may be more cost effective and an easier route for recertification, but completing CBTs that are irrelevant to your actual job is a waste of time. I think money and time could be better utilized than to send thousands through a civilian certification process that really isn't needed.	5/31/2018 12:51 PM
7	None.	5/31/2018 8:36 AM
8	It's a huge bottle neck for getting new people into our job. While I've been in, we've had 5-6 airmen fail out of sec plus and not come to our duty station while more and more people are PCS'ing and getting out.	5/22/2018 12:30 PM
9	I do not like blanket policies and I dislike bandages that are supposed to fix problems. It never works but as a service component we continue with the same mistakes.	5/22/2018 12:10 PM
10	The 8570 mandate is well-intentioned as it intends to encourage continued education and growth within functional areas through required Continuing Education Units (CEUs). However, I have yet to meet anyone that completes the CEU requirement in the way the DoD requires, most will play FedVTE videos in their desktop's background as they complete other mission-related work, then count the course for the corresponding number of hours toward CEU/certification credit.	5/22/2018 9:11 AM

Q29 My formal information technology-related education helped equip me with knowledge needed to succeed in my job in a combat communications unit

Answered: 55 Skipped: 12

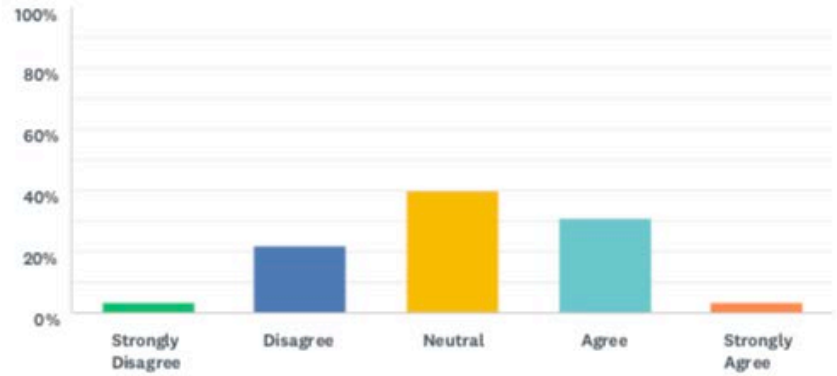


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.45%	3
Disagree (2)	18.18%	10
Neutral (3)	29.09%	16
Agree (4)	43.64%	24
Strongly Agree (5)	3.64%	2
TOTAL		55

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.22	0.97

Q30 My formal information technology-related education helped equip me with skills needed to succeed in my job in a combat communications unit

Answered: 55 Skipped: 12

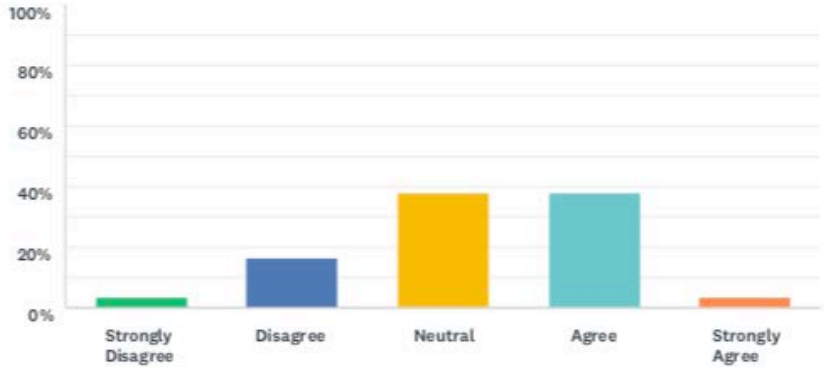


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	3.64%	2
Disagree (2)	21.82%	12
Neutral (3)	40.00%	22
Agree (4)	30.91%	17
Strongly Agree (5)	3.64%	2
TOTAL		55

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.09	0.90

Q31 My formal information technology-related education helped equip me with abilities needed to succeed in my job in a combat communications unit

Answered: 55 Skipped: 12

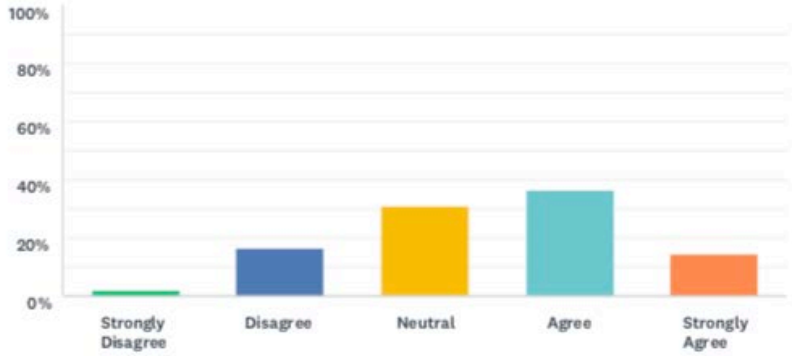


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	3.64%	2
Disagree (2)	16.36%	9
Neutral (3)	38.18%	21
Agree (4)	38.18%	21
Strongly Agree (5)	3.64%	2
TOTAL		55

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.22	0.89

Q32 Formal information technology-related education needs to change, to help make new Airmen more effective in their role as a cyberspace operator or telecommunications provider

Answered: 55 Skipped: 12



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	1.82%	1
Disagree (2)	16.36%	9
Neutral (3)	30.91%	17
Agree (4)	36.36%	20
Strongly Agree (5)	14.55%	8
TOTAL		55

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	4.00	3.45	0.99

#	PLEASE PROVIDE ADDITIONAL COMMENTS IN THE BOX BELOW	DATE
1	Seeking personal education in the IT field filled in the large holes left by Air Force training programs, unfortunately, this relies on people seeking out education themselves.	6/1/2018 10:23 AM
2	It's possible that changing it could improve it, but it seems effective as it is and I can't think of any major changes that I would implement if I were in charge of it.	6/1/2018 9:32 AM
3	I don't believe that formal training will ever be adequate for Airmen to be effective in their current role as a cyberspace operator due to time constraints and always changing challenges. I believe the best way to tackle this problem is by restructuring and focusing Airmen's training and responsibilities to a smaller scope thereby increasing their ability to understand their craft.	6/1/2018 2:52 AM
4	Again, more emphasis on troubleshooting	5/31/2018 2:46 PM
5	There should be more focus on real training in the unit instead of just getting tasks signed off. In addition, CBTs are a waste of time for the majority of personnel. The best way to train a competent technician is to build the network, insert problems, and troubleshoot the problems down. However, this takes time and effort that is difficult to come by when we are completing menial tasks or reinventing the wheel 50 times for the sake of being busy or trying to appease someone's idea that refuses to listen to the majority of the unit.	5/31/2018 1:46 PM

6	New in the information technology industry, learned basic technical skills prior to enlistment in the military, further learned IT concepts and skills at technical training.	5/31/2018 8:38 AM
7	All relevant training outside of REDCOM training for our voice switches has gone away. The schoolhouse in Savannah is laughably deficient in the skills needed to set up our equipment. They can't teach our equipment and network, can't answer the questions our new airmen have, and are a waste of government funding.	5/31/2018 8:32 AM
8	more relevant training	5/24/2018 3:24 PM
9	Being stationed at a combat communications unit, the knowledge acquired at tech school is not nearly enough to provide you with a clear understanding of how to properly perform your job.	5/24/2018 1:39 PM
10	I think its about as good as it can get until you are actually working on the equipment that you will be working with at your base.	5/24/2018 1:37 PM
11	Most training related to managing the NCC-D comes from OJT and performing the research on your own. Some of my best training has comes from youtube, reading blogs and troubleshooting the system when encountering unknown errors. When working on the NCC-D system you have to live and breath PACE when it comes to managing deployable data center. Know how to surgically perform triage on your system while still maintaining services to your customer.	5/24/2018 12:07 PM
12	I have not personally received any formal information technology-related education. I was offered training at one point in time but the unit failed in getting the "offered" training for us, and has done so on multiple occasions.	5/23/2018 9:31 AM
13	I have not received any formal information technology-related education outside of technical school and SEC+, nor have I been offered said education at least that I am aware of.	5/23/2018 9:17 AM
14	Providing Airman, specifically combat communicators, with supplemental training prior to arrival at their duty station is critical to developing a well-rounded technician. The ops tempo of an enabler unit sometime detracts from formal and on the job training.	5/22/2018 12:37 AM

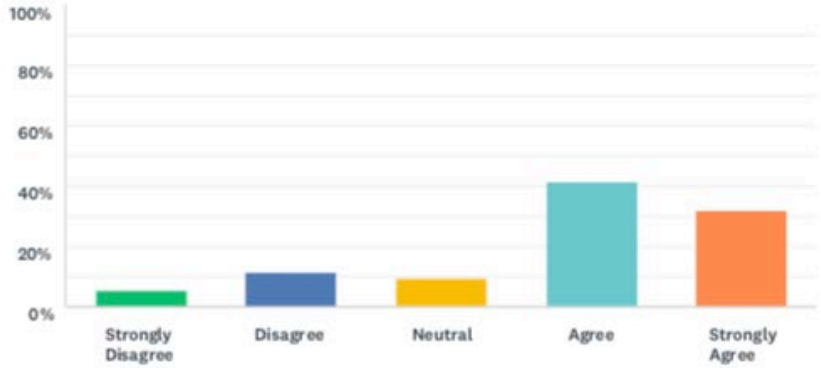
Q33 Please provide any other comments you may have concerning your undergraduate or graduate education, as it applies to your ability to succeed as a member in a combat communications unit

Answered: 2 Skipped: 65

#	RESPONSES	DATE
1	I may have misunderstood what was meant by "formal IT-related education" in this context. If it's referring to college IT or computer science programs, I have never attended one.	6/1/2018 9:32 AM
2	None.	5/31/2018 8:38 AM

Q34 The on-the-job-training I have received since arriving at the unit has helped equip me with the knowledge needed to succeed in my job in a combat communications unit

Answered: 53 Skipped: 14

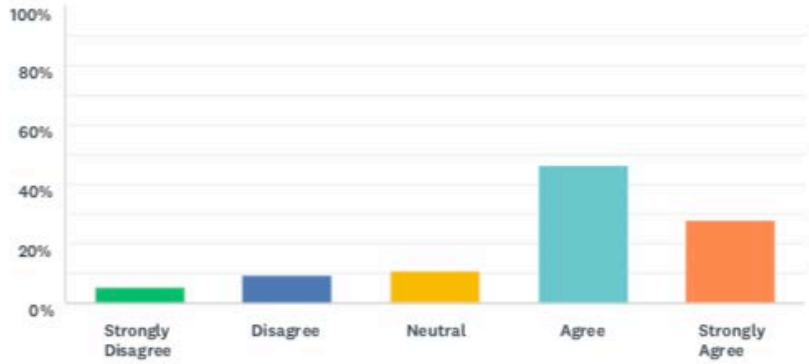


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.66%	3
Disagree (2)	11.32%	6
Neutral (3)	9.43%	5
Agree (4)	41.51%	22
Strongly Agree (5)	32.08%	17
TOTAL		53

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	4.00	3.83	1.16

Q35 The on-the-job-training I have received since arriving at the unit has helped equip me with the skills needed to succeed in my job in a combat communications unit

Answered: 54 Skipped: 13

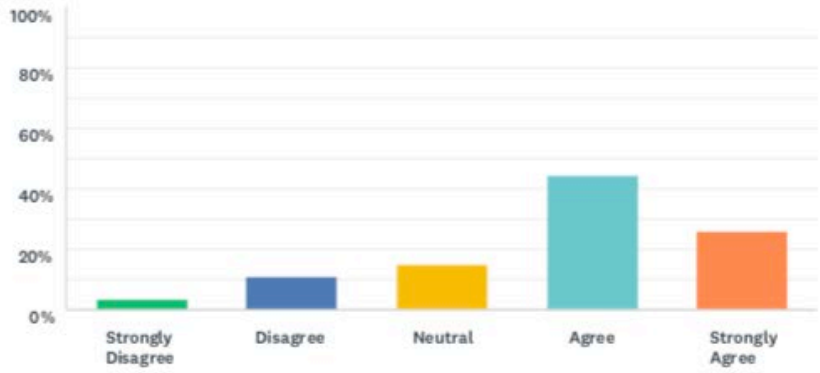


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.56%	3
Disagree (2)	9.26%	5
Neutral (3)	11.11%	6
Agree (4)	46.30%	25
Strongly Agree (5)	27.78%	15
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	4.00	3.81	1.11

Q36 The on-the-job-training I have received since arriving at the unit has helped equip me with the abilities needed to succeed in my job in a combat communications unit

Answered: 54 Skipped: 13

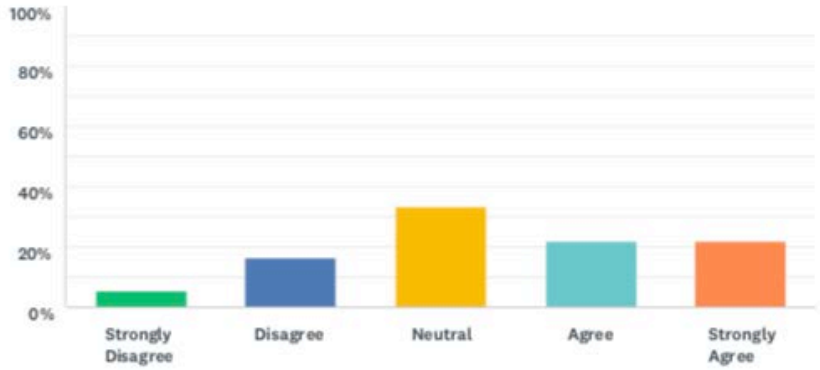


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	3.70%	2
Disagree (2)	11.11%	6
Neutral (3)	14.81%	8
Agree (4)	44.44%	24
Strongly Agree (5)	25.93%	14
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	4.00	3.78	1.07

Q37 On-the-job-training needs to change, to help make new Airmen more effective in a combat communications unit

Answered: 54 Skipped: 13



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.56%	3
Disagree (2)	16.67%	9
Neutral (3)	33.33%	18
Agree (4)	22.22%	12
Strongly Agree (5)	22.22%	12
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.39	1.16

#	PLEASE PROVIDE ADDITIONAL COMMENTS IN THE BOX BELOW	DATE
1	When I first got to my squadron, nobody was proficient in my career field. It wasn't until 2+ years later That we got a SSgt who actually knew something.	6/1/2018 5:00 PM
2	The OJT given to operators here is merely "read this and do what it says". Our TOs are very thorough when it comes to how to perform specific steps in a "staying on the rails" way. The problem comes when an issue appears that is not covered by a TO and we don't know how to handle it because we don't understand the theory behind the equipment we are working on.	6/1/2018 10:35 AM
3	OJT relies on effective trainers. When I arrived here, that was not the case and I was not "taught" anything for almost a year. I taught myself a lot of things but that isn't the definition of OJT. I have strived to ensure I provide better OJT.	6/1/2018 10:24 AM
4	OJT is the only training that actually helps combat comm in any way	6/1/2018 10:19 AM
5	Apparently there used to be a formal classroom environment for training in the 5th Mob. That was all done away with by the time I arrived. I've learned a lot from our haphazard, "learn by doing" kind of approach. But I've also heard from other airmen that that classroom environment was helpful. Whatever form it takes, I think the 5th Mob would really benefit from having a comprehensive and formalized training plan for new airmen who arrive from tech school. Something besides just CDC's/TBA Tasks (which are a waste of time) and trial by fire.	6/1/2018 9:36 AM

6	Combat comm needs to focus on being technical experts first and foremost. Airmen need to be experts in their field/equipment. Secondly, they need to learn other areas of the combat comm machine and have an understanding/proficiency in the other fields/equipment. Lastly, the logistical, defense, hoorah stuff come last. I have seen this mindset/model work in Tier 1/Tier 2 direct support units. The ATSO portion will not happen if comms is not up.	6/1/2018 8:17 AM
7	OJT is adequate for performing basic setup however troubleshooting and a deep understanding can only be achieved through years of experience.	6/1/2018 3:02 AM
8	In combat communications they are always trying to get new equipment, so we always have to be trying to learn the new equipment and how to properly implement the devices	6/1/2018 1:11 AM
9	The CRTC/SLC FTU is sufficient for setting up equipment when ample and proper documentation is available, but do not prepare the airman for something unexpectedly broken, such as TDC SU2017/SU2018 for the EVEs	5/31/2018 2:48 PM
10	On-the-job training needs to be actual on the job training, not completing a task once and getting it signed off. However, there is little time to do more than be shown once and hope one gets it.	5/31/2018 1:48 PM
11	We need to a better job training our folks. A greater emphasis needs to be on OJT rather than the hurry up and get someone trained mindset. The lack of NCOs make it difficult to get our airman trained in a timely fashion. Constantly getting pulled in other directions for other less important projects stretch us thin and make good training plans ineffective.	5/31/2018 12:58 PM
12	Needs more time in formal training. Shop possibly needs increase in Airmen personnel to complete both PMIs, PDIs, and allowing experienced personnel to teach formal training.	5/31/2018 8:42 AM
13	Our unit does not provide for dedicated time we need to get OJT done the way it needs to, so the focus ends up being to knock out the tasks needed for our 5-level, which revolve around individual pieces of equipment. So we end up being able to configure the devices individually but not establish a network that works.	5/31/2018 8:33 AM
14	Rather than solely working TDC equipment during training, a lab should be established. An area where members can enter and focus on the configurations and "nitty-gritty" of the equipment.	5/24/2018 2:25 PM
15	The resources for on-the-job-training are provided but the training provided is generally very poor. It's almost a requirement to seek your own individual training to be able to perform at a combat communications unit.	5/24/2018 1:40 PM
16	Being a SSgt new to the career field I haven't had a chance to get much training.	5/24/2018 1:38 PM
17	After Initial/config training and sustainment training. Provide emergency/triage training. Master Minimum Equipment List (MMEL). Description. A minimum equipment list (MEL) is a list which provides for the operation of aircraft/weapon system. Knowing the critical system you need to operational. Performing system and hardware changes that will get you PMC as opposed to NMC	5/24/2018 12:15 PM
18	As I am unsure how to define on-the-job-training because of the lack there of I feel it needs to change, drastically.	5/23/2018 9:34 AM
19	I cant say much for one reason being I just Started my OJT, but as from what I can see is there helping as much and as best as they can.	5/22/2018 3:34 PM
20	The OJT is one of the few training materials that I feel truly help Airman understand our jobs and how to perform.	5/22/2018 12:42 PM
21	What needs to change is giving work centers time to actually conduct training and then leaving them alone.	5/22/2018 12:12 PM
22	I feel that a lot of time is wasted in OJT that could be focused more towards UTC qualification if pipeline Airman received more specialized fundamentals prior to arriving to the unit. Right now there's a huge gap to fill in OJT and the Airmen are not receiving all of the knowledge they need before eventually being tasked to a deployment,	5/22/2018 9:54 AM
23	The focus of on the training in this unit should be prioritized over day-to-day base supported functions. Airmen are more likely to deploy 2 to 3 times more than a base comm technician from the same base. Training is imperative due to limited support a combat communicator may receive in the environment he or she may support.	5/22/2018 12:42 AM

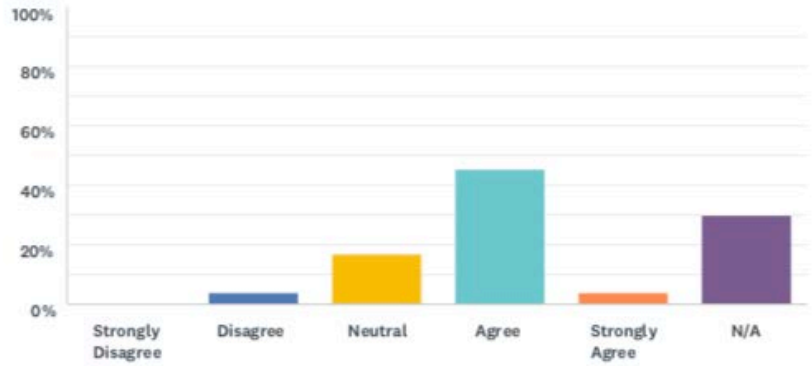
Q38 Please provide any other comments you may have concerning the on-the-job-training you have received since arriving at the unit, as it applies to your ability to succeed as a member in a combat communications unit

Answered: 3 Skipped: 64

#	RESPONSES	DATE
1	Needs to be changed in some way.	6/1/2018 5:00 PM
2	I received excellent OJT when I got here. I went to SLIC and AFETS courses as well as had knowledgeable NCOs and fellows Airmen that got me to where I am.	5/31/2018 12:58 PM
3	None.	5/31/2018 8:42 AM

Q39 As a 5-level in my AFSC, I feel that I possess the requisite career-field knowledge to effectively train my 3-level subordinates

Answered: 53 Skipped: 14

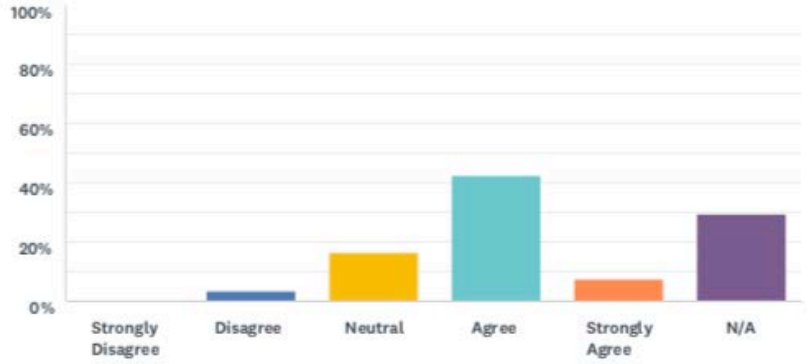


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	0.00%	0
Disagree (2)	3.77%	2
Neutral (3)	16.98%	9
Agree (4)	45.28%	24
Strongly Agree (5)	3.77%	2
N/A (6)	30.19%	16
TOTAL		53

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	6.00	4.00	4.40	1.19

Q40 As a 5-level in my AFSC, I feel that I possess the requisite career-field skills to effectively train my 3-level subordinates

Answered: 54 Skipped: 13

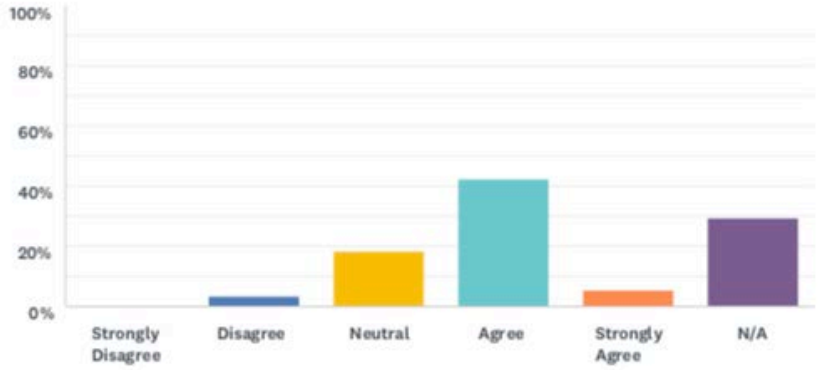


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	0.00%	0
Disagree (2)	3.70%	2
Neutral (3)	16.67%	9
Agree (4)	42.59%	23
Strongly Agree (5)	7.41%	4
N/A (6)	29.63%	16
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	6.00	4.00	4.43	1.18

Q41 As a 5-level in my AFSC, I feel that I possess the requisite career-field abilities to effectively train my 3-level subordinates

Answered: 54 Skipped: 13

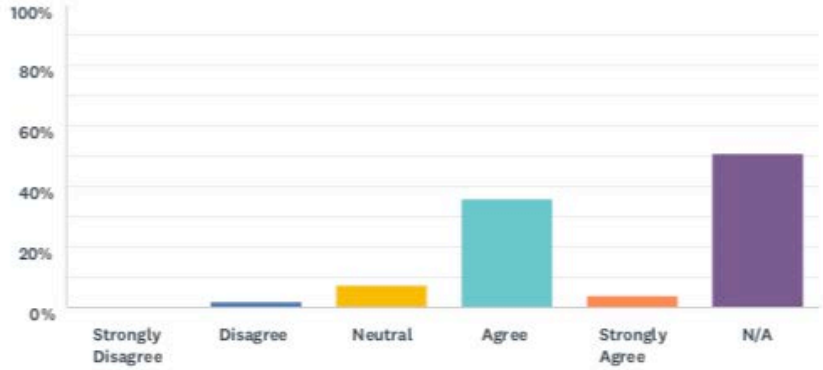


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	0.00%	0
Disagree (2)	3.70%	2
Neutral (3)	18.52%	10
Agree (4)	42.59%	23
Strongly Agree (5)	5.56%	3
N/A (6)	29.63%	16
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	6.00	4.00	4.39	1.19

Q42 As a 7-level in my AFSC, I feel that I possess the requisite career-field knowledge to effectively train my 3-level subordinates

Answered: 53 Skipped: 14

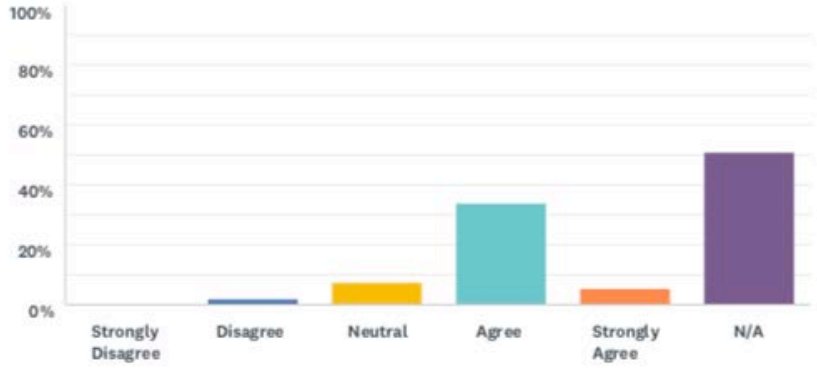


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	0.00%	0
Disagree (2)	1.89%	1
Neutral (3)	7.55%	4
Agree (4)	35.85%	19
Strongly Agree (5)	3.77%	2
N/A (6)	50.94%	27
TOTAL		53

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	6.00	6.00	4.94	1.16

Q43 As a 7-level in my AFSC, I feel that I possess the requisite career-field skills to effectively train my 3-level subordinates

Answered: 53 Skipped: 14

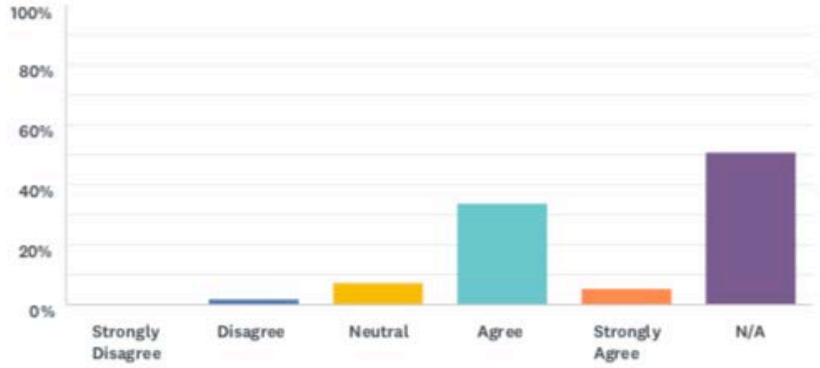


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	0.00%	0
Disagree (2)	1.89%	1
Neutral (3)	7.55%	4
Agree (4)	33.96%	18
Strongly Agree (5)	5.66%	3
N/A (6)	50.94%	27
TOTAL		53

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	6.00	6.00	4.96	1.15

Q44 As a 7-level in my AFSC, I feel that I possess the requisite career-field abilities to effectively train my 3-level subordinates

Answered: 53 Skipped: 14



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	0.00%	0
Disagree (2)	1.89%	1
Neutral (3)	7.55%	4
Agree (4)	33.96%	18
Strongly Agree (5)	5.66%	3
N/A (6)	50.94%	27
TOTAL		53

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	6.00	6.00	4.96	1.15

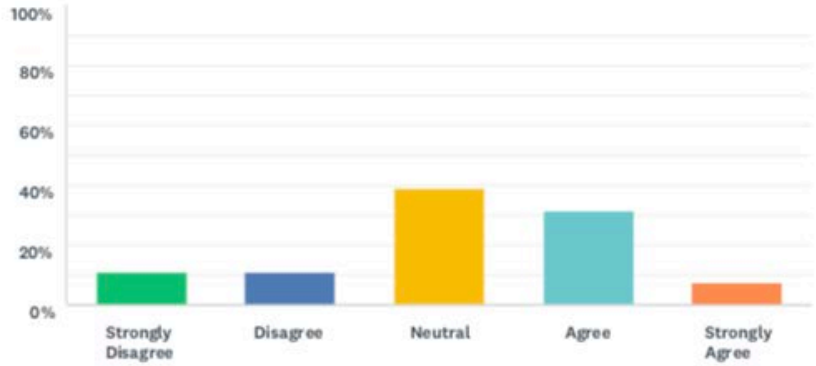
Q45 Please provide any other comments you may have concerning your ability to train your 3-level subordinates

Answered: 9 Skipped: 58

#	RESPONSES	DATE
1	5 Levels are inevitable, and through events over the years, someone could be a 5 level but possess limited to no knowledge on the equipment.	6/1/2018 10:25 AM
2	I could definitely train them and get them up to the same speed as me. I feel like I still have plenty more to learn myself, though.	6/1/2018 9:38 AM
3	I have little time to stay proficient in completing tasks however I retain the knowledge and ability to do them.	6/1/2018 3:05 AM
4	The skills and abilities required to effectively train personnel cannot be attained until allowed to work on a live network with real problems. Our network comes up and gets taken back down without customers and without the off the wall problems that are associated with having a network up for an indefinite amount of time.	5/31/2018 1:53 PM
5	Time availability, with increase in skill-level there are the potential possibilities for increase TDYs, deployments.	5/31/2018 8:44 AM
6	There's huge skill disparity among our 5-levels, since our shop really has 2 SME's, and their ability to pass on their skills is limited by our not having focus on dedicated training time. Even when we were given 60 days dedicated to training, our trainer was tasked out to other things half of it.	5/31/2018 8:35 AM
7	If you came to the field as an airman and you have been working with the equipment every since you came in then I feel you are capable of training	5/24/2018 1:40 PM
8	I feel I possess these abilities not because of the training and knowledge I have received from the unit itself but because of certain individuals taking time to train me.	5/23/2018 9:37 AM
9	I hardly know what I'm doing. It'll be hard to train someone just as clueless as me on stuff.	5/22/2018 12:35 PM

Q46 The additional vendor-supplied training I have received since arriving at the unit has helped equip me with the knowledge needed to succeed in my job in a combat communications unit

Answered: 54 Skipped: 13

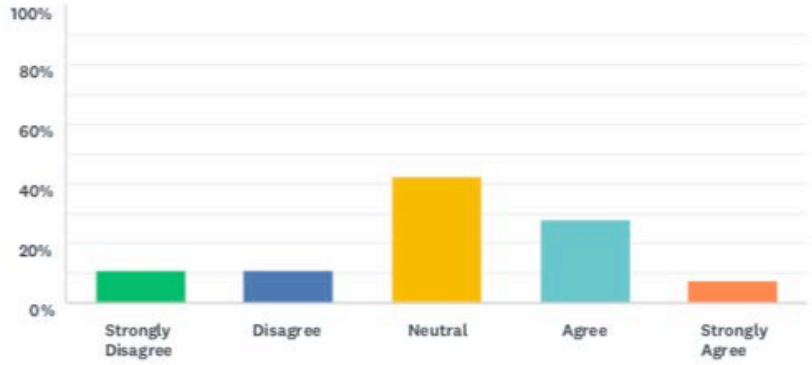


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	11.11%	6
Disagree (2)	11.11%	6
Neutral (3)	38.89%	21
Agree (4)	31.48%	17
Strongly Agree (5)	7.41%	4
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.13	1.07

Q47 The additional vendor-supplied training I have received since arriving at the unit has helped equip me with the skills needed to succeed in my job in a combat communications unit

Answered: 54 Skipped: 13

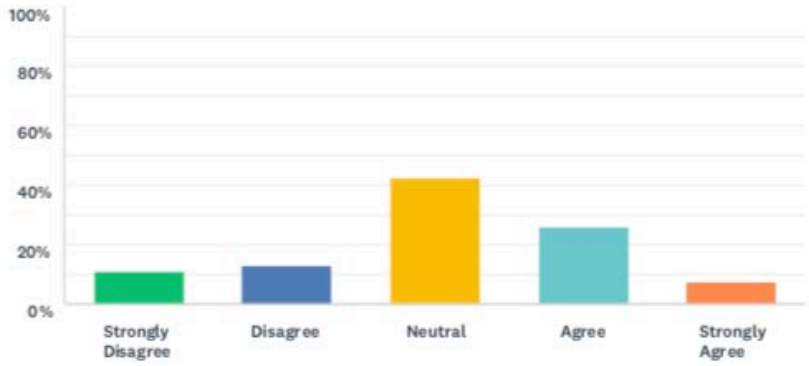


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	11.11%	6
Disagree (2)	11.11%	6
Neutral (3)	42.59%	23
Agree (4)	27.78%	15
Strongly Agree (5)	7.41%	4
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.09	1.06

Q48 The additional vendor-supplied training I have received since arriving at the unit has helped equip me with the abilities needed to succeed in my job in a combat communications unit

Answered: 54 Skipped: 13

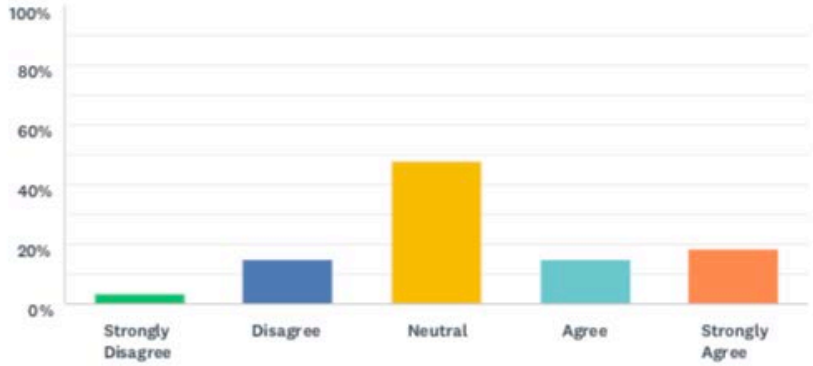


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	11.11%	6
Disagree (2)	12.96%	7
Neutral (3)	42.59%	23
Agree (4)	25.93%	14
Strongly Agree (5)	7.41%	4
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.06	1.06

Q49 Vendor-supplied training needs to change, to help make new Airmen more effective in their role as a combat communicator

Answered: 54 Skipped: 13



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	3.70%	2
Disagree (2)	14.81%	8
Neutral (3)	48.15%	26
Agree (4)	14.81%	8
Strongly Agree (5)	18.52%	10
TOTAL		54

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.30	1.05

#	PLEASE PROVIDE ADDITIONAL COMMENTS IN THE BOX BELOW	DATE
1	It would be nice to receive some vendor-supplied training. Aside from never receiving any vendor supplied training, we run into the issue of PMO implementation of technology being so far off the vendor image, that working with the vendor results in them trying to decipher why the PMO would implement in that manner.	6/1/2018 10:37 AM
2	I understand it is expensive, but when we have Private Sector or vendor training, we all benefit greatly.	6/1/2018 10:26 AM
3	We get vendor supplied training?	6/1/2018 10:22 AM
4	We've been told that there's lots of funding and opportunity to go to vendor training, but it's felt like Lucy pulling away the football. It almost never materializes. The main way it should change is making it actually available to airmen.	6/1/2018 9:48 AM
5	Vendor-supplied training needs to become more easily available. We are told there's a lot of money available for training and to submit a request for what courses we want. However, they rarely ever get approved. The more training available the better.	6/1/2018 9:33 AM
6	Vendor supplied training is highly effective in teaching the specifics of equipment as it is focused and deliberate.	6/1/2018 3:06 AM
7	Unknown, as never received training outside of SLC/CRTC	5/31/2018 2:51 PM

8	There should be more opportunities that come down	5/31/2018 1:59 PM
9	We need to pursue more vendor and commercial training. The quality of training that is gained from a private organization is far superior to any Air Force training I have attended. Private organizations can get very deep into explanations about how things work and why things are done certain ways. Where Air Force training is focused on the most common Air Force equipment and problems without building a great base of knowledge. Without a strong foundation a house will fall down. The same is true for creating great technicians.	5/31/2018 1:57 PM
10	I don't think its needs to change, we need to continue the emphasize the importance of vendor training and continue to get our people in the classes they need	5/31/2018 1:00 PM
11	COMPTIA Security+ training was all that was provided in technical school training.	5/31/2018 8:47 AM
12	REDCOM training was excellent. I don't think outside of that though that we have equipment that on it's own necessitates its own vendor-supplied training	5/31/2018 8:36 AM
13	the additional training has helped but I don't get to use the knowledge often	5/29/2018 1:38 PM
14	provide more vendor training for equipment we use	5/24/2018 3:25 PM
15	I've never had vendor-supplied training during my time in combat comm.	5/24/2018 2:26 PM
16	Training guides provided by the vendors are generally never used when working on our equipment. The best way to learn any specific piece of equipment is to be trained on it by a subject matter expert who has previous experience using that equipment.	5/24/2018 1:43 PM
17	Haven't received any	5/24/2018 1:40 PM
18	Have not received vendor training since my arrival to the unit. Nov 2014	5/24/2018 1:06 PM
19	No vender-supplied training to elaborate on.	5/24/2018 10:16 AM
20	In my experience, vendor training has been very minimum and rarely ever applicable to anything outside of the standard configuration. This has limited my understanding of the protocols/settings used to is/isn't rather than why/why not. I know what to do, but don't understand why I'm doing it.	5/23/2018 12:13 PM
21	There have been a few occasions where the unit has made us aware of vendor-supplied training that was "available" but on almost every instance that I know of the training has fallen through. Although this may be the case the unit likes to remind us of how much more training we are "receiving" and how much money we have specifically for training.	5/23/2018 9:42 AM
22	I have not participated in an such training.	5/22/2018 12:43 PM
23	I have never in my life received vendor-supplied training.	5/22/2018 12:35 PM
24	We need more of it.	5/22/2018 12:13 PM
25	I have not received any vendor supplied training. I would forsee that changing in the future.	5/22/2018 9:56 AM
26	Maybe not necessarily change but increase the amount of training and specialized to what the Airmen need to accomplish. (For example, HBSS courses, MS Exchange course, firewall courses)	5/22/2018 12:45 AM

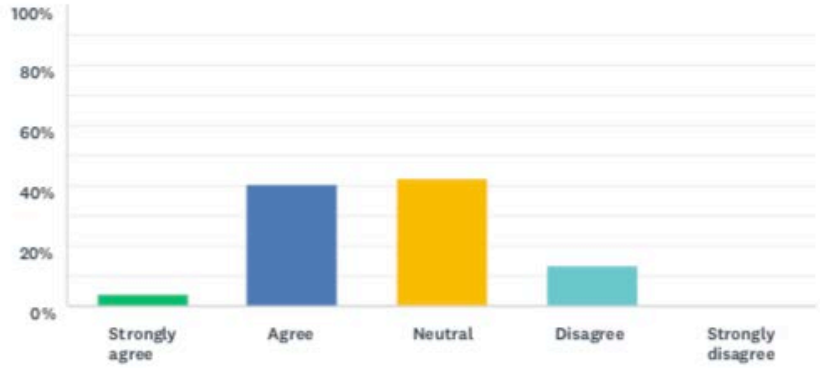
Q50 Please provide any other comments you may have concerning the vendor-supplied training you have received, as it applies to your ability to succeed as a member in a combat communications unit

Answered: 3 Skipped: 64

#	RESPONSES	DATE
1	I haven't gotten any vendor supplied training	6/1/2018 10:22 AM
2	None.	5/31/2018 8:47 AM
3	more certification classes would help when working with the X2's	5/29/2018 1:38 PM

Q51 The Unit Type Code (UTC) training I have received since arriving at the unit has helped equip me with the knowledge needed to succeed in my job in a combat communications unit

Answered: 52 Skipped: 15

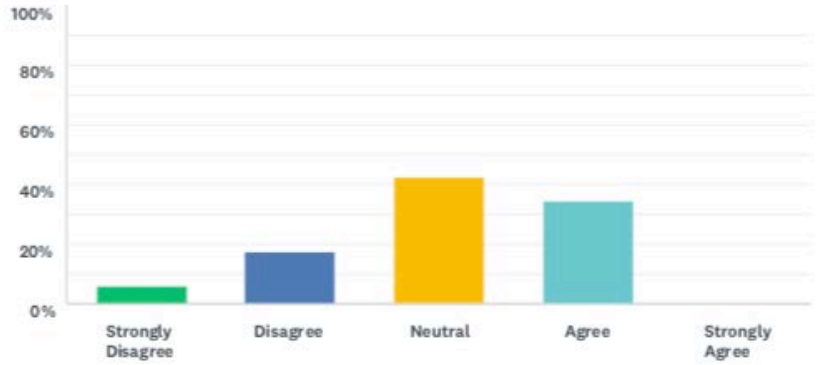


ANSWER CHOICES	RESPONSES	
Strongly agree (1)	3.85%	2
Agree (2)	40.38%	21
Neutral (3)	42.31%	22
Disagree (4)	13.46%	7
Strongly disagree (5)	0.00%	0
TOTAL		52

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	3.00	2.65	0.76

Q52 The Unit Type Code (UTC) training I have received since arriving at the unit has helped equip me with the skills needed to succeed in my job in a combat communications unit

Answered: 52 Skipped: 15

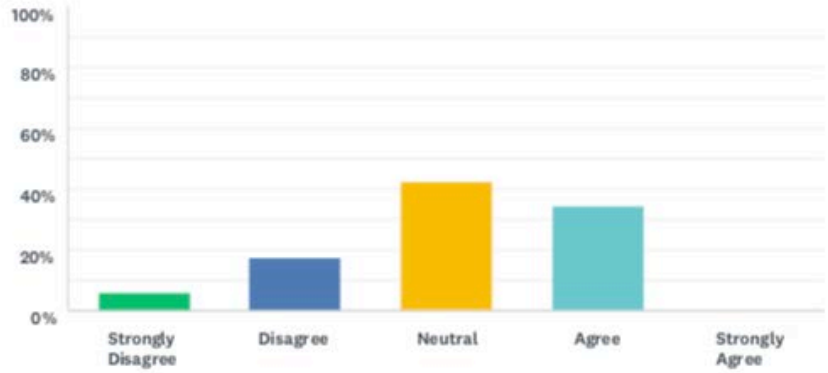


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.77%	3
Disagree (2)	17.31%	9
Neutral (3)	42.31%	22
Agree (4)	34.62%	18
Strongly Agree (5)	0.00%	0
TOTAL		52

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	3.00	3.06	0.86

Q53 The Unit Type Code (UTC) training I have received since arriving at the unit has helped equip me with the abilities needed to succeed in my job in a combat communications unit

Answered: 52 Skipped: 15

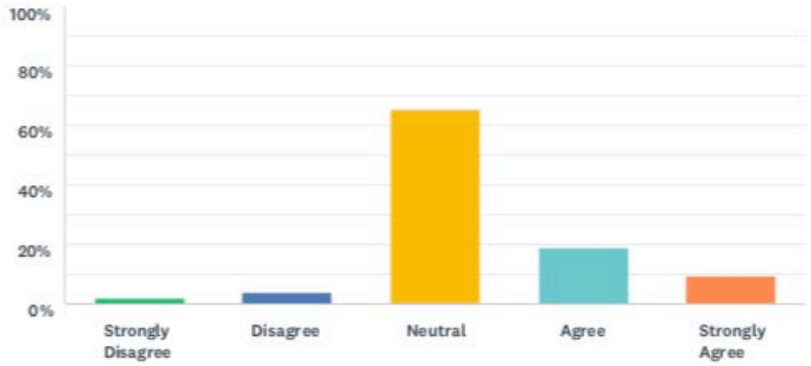


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.77%	3
Disagree (2)	17.31%	9
Neutral (3)	42.31%	22
Agree (4)	34.62%	18
Strongly Agree (5)	0.00%	0
TOTAL		52

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	3.00	3.06	0.86

Q54 Unit Type Code training needs to change, to help make new Airmen more effective in their role as a combat communicator

Answered: 52 Skipped: 15



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	1.92%	1
Disagree (2)	3.85%	2
Neutral (3)	65.38%	34
Agree (4)	19.23%	10
Strongly Agree (5)	9.62%	5
TOTAL		52

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.31	0.77

#	PLEASE PROVIDE ADDITIONAL COMMENTS IN THE BOX BELOW	DATE
1	It's still a bunch of "read and regurgitate" type training, keeping us on the rails and unable to adapt.	6/1/2018 10:38 AM
2	Many tasks are irrelevant to our current setup and modernization. They are dated.	6/1/2018 10:26 AM
3	I'm not entirely sure what all constitutes "UTC Training". CDCs, TBA tasks, and CBTs have mostly been useless and very large time sinks in my opinion. The more that we can move away from those types of "training", the better. The most effective training we've had so far, in my opinion, has been training prepared by 5-level airmen who put together SOPs and guided other airmen while they actively went through the steps.	6/1/2018 10:00 AM
4	Training needs to be more focused and deliberate.	6/1/2018 3:09 AM
5	Some TBA tasks can change for the better, but the basic core tasks aren't bad.	5/31/2018 2:01 PM
6	Once again this falls back to having a weak training program that is reliant on signing off tasks and not on the quality of training. I have a decent amount of knowledge, but applying that knowledge to have the skills and abilities to troubleshoot network problems is another story. It was a trial by fire in order to figure out how to effectively troubleshoot a network quickly on my first deployment.	5/31/2018 2:00 PM

7	Attitudes toward training need to change. As a combat communicator, our job in-garrison is to train to do the mission. When we have airmen who have been on-station longer than 12-months and still cant operate the equipment something needs to change. Training is lacking because our SrA aren't able to train 3-levels because they don't know the equipment themselves. TSgts who should be somewhat knowledgeable are unable to provided quality training for the same reasons. Everyone relies on one individual for training and although he is an excellent trainer, he is only one guy and isn't able to train the amount of 3-level airmen in a timely fashion	5/31/2018 1:13 PM
8	Training depends on time availability of the trainers, as well as the individual's motivation and desire to be trained on pieces of equipment in order for them to be proficient at it.	5/31/2018 8:49 AM
9	I did not become capable of the tasks needed on exercise until long after having my UTC tasks squared away. Knowing equipment means nothing when the equipment is isolated.	5/31/2018 8:37 AM
10	i'm still a new NCO in the Mobb	5/24/2018 3:26 PM
11	Haven't received any yet	5/24/2018 1:41 PM
12	Some of the UTC training I have received has helped but majority of the time the training is done to teach but merely to get the Airmen green/complete on all their tasks.	5/23/2018 9:45 AM
13	We need timelines to effectively qualify in UTC's. I personally feel like UTC training should commence upon the completion of CDC's. Additionally, each trainee should be trained in every UTC applicable to their AFSC. A clear cut training track and milestones should aid with this.	5/22/2018 9:59 AM
14	For a 3D0X3, most of the tasks are covered in the 5-lvl upgrade training program. The addition of some system admin tasks on ACAS and HBSS are the only things outside the traditional 3D0X3 career progression.	5/22/2018 12:48 AM

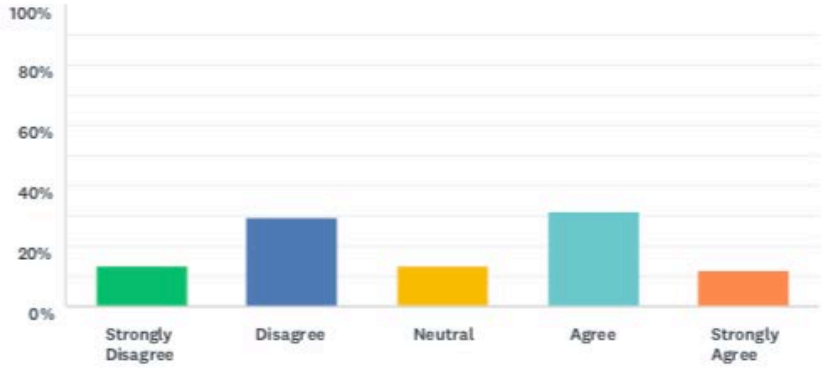
Q55 Please provide any other comments you may have concerning the Unit Type Code (UTC) training you have received since arriving at the unit, as it applies to your ability to succeed as a member in a combat communications unit

Answered: 1 Skipped: 66

#	RESPONSES	DATE
1	Time availability of trainers, and individual motivation and desire to be trained.	5/31/2018 8:49 AM

Q56 I feel confident that if I left tomorrow, I could successfully complete a combat communications deployment with no one else from my AFSC along to help me.

Answered: 51 Skipped: 16



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	13.73%	7
Disagree (2)	29.41%	15
Neutral (3)	13.73%	7
Agree (4)	31.37%	16
Strongly Agree (5)	11.76%	6
TOTAL		51

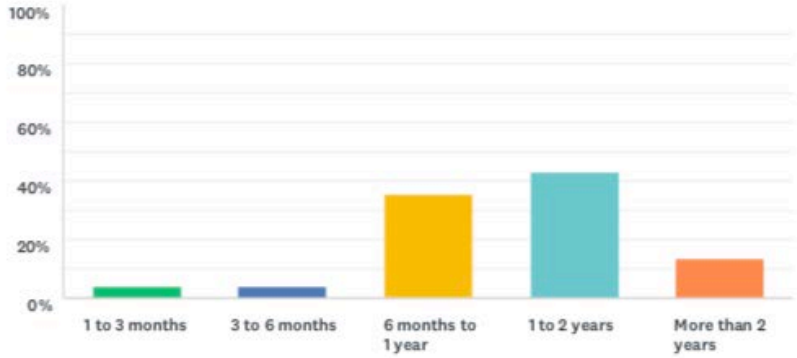
BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	2.98	1.28

#	PLEASE PROVIDE ADDITIONAL COMMENTS IN THE BOX BELOW	DATE
1	Being the only 3D0X2 on a combat comm deployment would probably be Hell. No single airman in the shop knows everything there is to know, and we always work very much as a team. Especially for troubleshooting problems, two (or more) sets of eyes are always better than one.	6/1/2018 10:50 AM
2	Okay, I might be reading into this question a bit too much. I would never want to do any body of work without at least a second set of eyes to take a look at it. When my work supports combat missions and the stakes are that high, I would trust just my own training to it. Maybe that does speak to the quality of the training on a deeper level, so there's that.	6/1/2018 10:40 AM
3	I've done it before. In addition to training, fix our manning. Real talk, combat comm needs more than 8 people in a shop. Fix that	6/1/2018 10:23 AM
4	I am a SNCO and would require a few weeks to refresh my skills prior to deploying as a technical member.	6/1/2018 3:13 AM
5	Depends on the equipment, as my ability to troubleshoot is dependent on the equipment I am presented to work with	5/31/2018 2:52 PM
6	It would be a trial by fire and difficult at the best, but the job would get done. However, it would not be as effective as it could be due to a lack of quality training.	5/31/2018 2:06 PM

7	Team work is vital to a combat communications deployment. Cooperation and contribution of each individual in a team has a higher possibility to successfully complete a deployment.	5/31/2018 8:57 AM
8	i'm brand new to the mob	5/24/2018 3:26 PM
9	I would accomplish said task, but not with the time constraints placed.	5/24/2018 2:29 PM
10	I haven't had the training to do so and after retraining I was sent to a squadron where I would not be touching the equipment for over a year.	5/24/2018 1:42 PM
11	I feel that while I do know almost everything necessary to perform my job alone I have not been given the hands on training necessary to know for certain that I could do everything by my self.	5/23/2018 9:49 AM
12	So again Just started and you never know what could happen in the field, so there is some spots where I don't know if I could do what's asked of me. however I will do my best, find out how and if it comes down to it die trying.	5/22/2018 3:43 PM
13	I have not been stationed here long enough to obtain the knowledge to successful carry out said mission.	5/22/2018 12:45 PM
14	If I was trained further I would feel more confident.	5/22/2018 12:39 PM
15	With my time in the service, a prior 3C0X1 background, and operating outside my AFSC, I would be able to operate with little to no assistance.	5/22/2018 12:54 AM

Q57 To be truly effective in a combat communications unit, I feel that it takes about this long to become confident and comfortable to operate the equipment independently, or on my own with little to no help from others.

Answered: 51 Skipped: 16



ANSWER CHOICES	RESPONSES	
1 to 3 months (1)	3.92%	2
3 to 6 months (2)	3.92%	2
6 months to 1 year (3)	35.29%	18
1 to 2 years (4)	43.14%	22
More than 2 years (5)	13.73%	7
TOTAL		51

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	4.00	3.59	0.91

#	PLEASE ADD ANY OTHER COMMENTS YOU MAY HAVE IN THE BOX BELOW	DATE
1	The answer to this question highly depends on what level of "effective" and "operate" you're talking about. In combat comm, 3D0X2s basically have to be able to build and maintain the majority of an entire network. For a single individual to do that, they have to have a broader and more diverse skillset than an airman in a base comm scenario would have. I could easily expect someone to be able to build and cable up a stack after only a couple weeks of training. That's simple. Creating user accounts and other basic tasks is similarly simple. But for a single individual to be able to smoothly operate the entire network and all of its services on his own, "jack of all trades" doesn't cut it. There are so many nuances and challenges present in each and every service we provide, you'd have to be a master of all trades. I wouldn't expect mastery from any airman that isn't yet in the NCO tier, and even then there are quite a few NCOs who would be found lacking.	6/1/2018 10:50 AM
2	**With an interest. Some people will never be effective	6/1/2018 10:28 AM
3	I have very few members who even as NCOs are proficient and confident in all aspects of their UTC.	6/1/2018 3:13 AM
4	This changes from person to person. Some don't learn as well, or as quickly as others.	6/1/2018 12:53 AM

5	How long it takes to be truly effective at operating combat communications equipment is dependent on the training. If there was nothing going on but training every duty day then 6 months to a year would be reasonable for the average technician. However, with the way our unit works it is more likely to be closer to the 2 year mark if the new personnel are getting on exercises and setting the equipment up without cut-sheets.	5/31/2018 2:06 PM
6	In order to be confident and proficient at a skill, it requires continual training, physical and mental preparedness. A similarity would be riding a bicycle or driving a vehicle; some individuals take longer than others but eventually learn from their mistakes and become proficiently skilled.	5/31/2018 8:57 AM
7	We never have time to train the way we need to, and our experience in the field on exercise is highly sporadic.	5/31/2018 8:39 AM
8	6 months to 1 year of solely training, no additional duties, no extra tasks; member's only priority is to train and not to be tasked with anything else.	5/24/2018 2:29 PM
9	This needs to be a continuous 6 months to a 1 year. if there are breaks in this, it would take longer to learn.	5/24/2018 10:18 AM
10	The reason it takes so long is the lack of training (especially quality training) provided to the Airmen.	5/23/2018 9:49 AM
11	I believe it could take between 8 months to a year and a half to truly understand every piece of equipment we work with.	5/22/2018 12:45 PM
12	I'm sure if we had an actual training program I'd feel more confident in my abilities.	5/22/2018 12:39 PM
13	This depends on the rank or prior experience but a pipeline Airman takes closer to 2 yrs. All others about 3-6 months that have prior comm experience.	5/22/2018 10:02 AM
14	3D0X3 duties in the primary position typically require a rank requirement of E-5 and typically manage Wing-lvl programs. A E-3 to E-4 lacks the experience to fully manage COMSEC, TEMPEST, and COMPUSEC with little to no help.	5/22/2018 12:54 AM

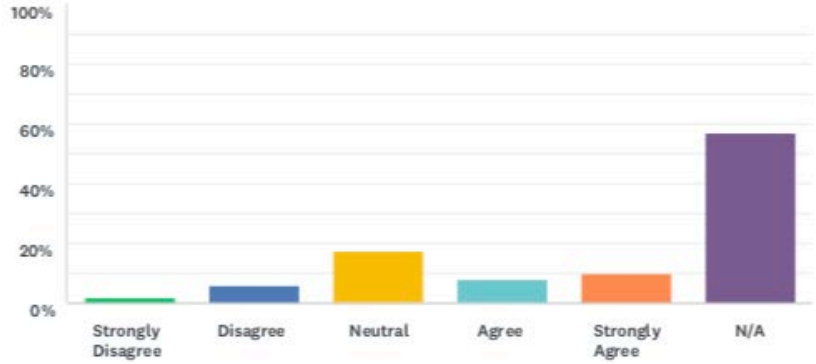
Q58 Please provide any other comments you may have concerning how long it takes to build a cyberspace operator that is capable of operating independently in a combat communications unit.

Answered: 3 Skipped: 64

#	RESPONSES	DATE
1	When new airmen leave too early it puts way more work on the SrA while also having to train them.	6/1/2018 5:04 PM
2	If we work as a team, we can accomplish much more than we could by ourselves. I think a team of A1Cs who have a year or so of experience could operate a combat comm network. An individual by himself would need much more training than that.	6/1/2018 10:50 AM
3	Time, time availability, and motivation and desire to be trained.	5/31/2018 8:57 AM

Q59 I feel that the 3DXXX career field merger in 2009 negatively affected the quality of the on-the-job training that I can provide to my subordinates.

Answered: 51 Skipped: 16

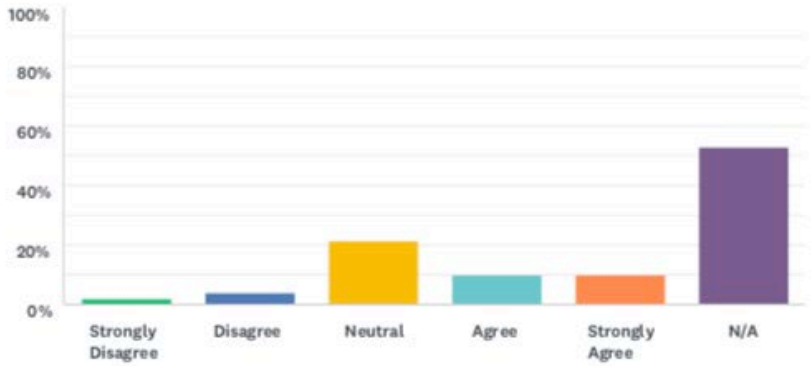


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	1.96%	1
Disagree (2)	5.88%	3
Neutral (3)	17.65%	9
Agree (4)	7.84%	4
Strongly Agree (5)	9.80%	5
N/A (6)	56.86%	29
TOTAL		51

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	6.00	4.88	1.48

Q60 I feel that the 3DXXX career field merger in 2009 negatively affected the quality of the on-the-job training that I receive from my superiors.

Answered: 51 Skipped: 16

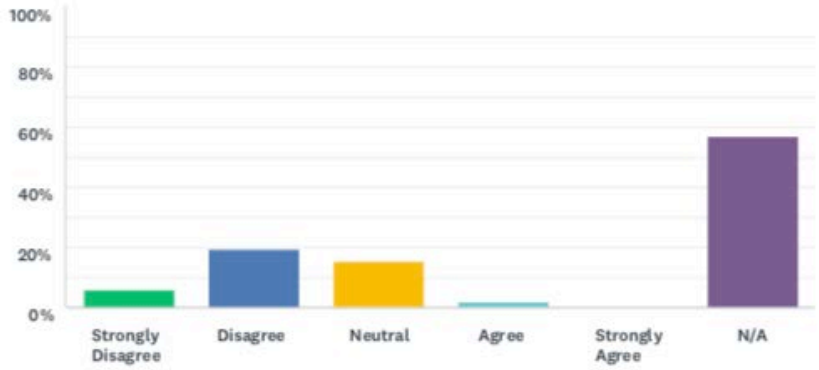


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	1.96%	1
Disagree (2)	3.92%	2
Neutral (3)	21.57%	11
Agree (4)	9.80%	5
Strongly Agree (5)	9.80%	5
N/A (6)	52.94%	27
TOTAL		51

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	6.00	4.80	1.46

Q61 Since merging into my 3DXXX career field in 2009, I feel that the Air Force has done enough to properly equip me with the right technical knowledge to succeed in my AFSC as a technician and as a supervisor

Answered: 51 Skipped: 16

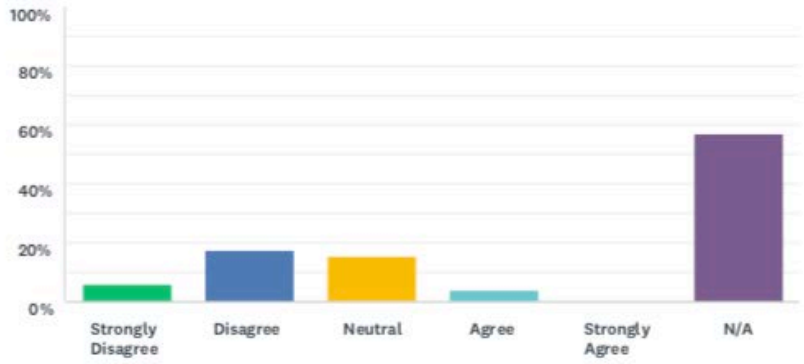


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.88%	3
Disagree (2)	19.61%	10
Neutral (3)	15.69%	8
Agree (4)	1.96%	1
Strongly Agree (5)	0.00%	0
N/A (6)	56.86%	29
TOTAL		51

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	6.00	4.41	1.89

Q62 Since merging into my 3DXXX career field in 2009, I feel that the Air Force has done enough to properly equip me with the right technical skills to succeed in my AFSC as a technician and as a supervisor

Answered: 51 Skipped: 16

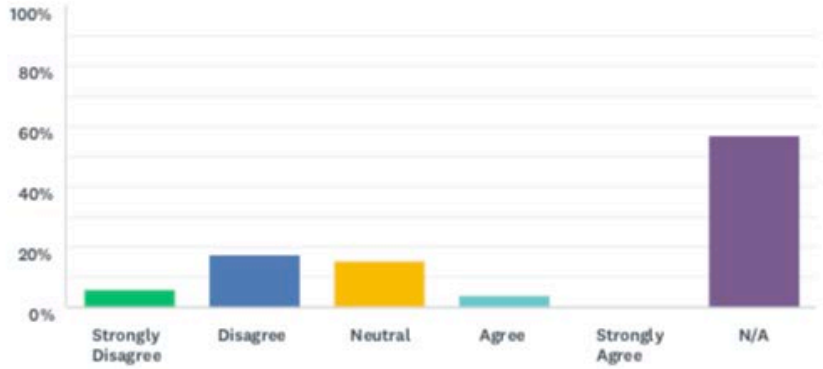


ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.88%	3
Disagree (2)	17.65%	9
Neutral (3)	15.69%	8
Agree (4)	3.92%	2
Strongly Agree (5)	0.00%	0
N/A (6)	56.86%	29
TOTAL		51

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	6.00	4.45	1.86

Q63 Since merging into my 3DXXX career field in 2009, I feel that the Air Force has done enough to properly equip me with the right technical abilities to succeed in my AFSC as a technician and as a supervisor

Answered: 51 Skipped: 16



ANSWER CHOICES	RESPONSES	
Strongly Disagree (1)	5.88%	3
Disagree (2)	17.65%	9
Neutral (3)	15.69%	8
Agree (4)	3.92%	2
Strongly Agree (5)	0.00%	0
N/A (6)	56.86%	29
TOTAL		51

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	6.00	4.45	1.86

Q64 Please provide any other comments you may have concerning the 2009 3DXXX career field merger, as it applies to your ability to succeed as a technician, trainer, and supervisor in a combat communications unit

Answered: 11 Skipped: 56

#	RESPONSES	DATE
1	I didn't enlist until 2016, so I have no comment on the 2009 merger.	6/1/2018 10:51 AM
2	I originally joined as a computer programmer, and had my career field changed to a cyber operator was too large of a gap (one not covered by technical school training either). I knew a bit of the related technology based upon my own interest in computers, but I spent a good two years stumbling through trying to catch up on applicable skills and knowledge.	6/1/2018 10:42 AM
3	Upon arriving to the unit in 2016 there was equipment that I had not heard of before arriving leaving me feeling as there were large gaps in my knowledge and skills.	6/1/2018 3:16 AM
4	9 years is more than enough time to get caught up on new career field requirements.	5/31/2018 1:23 PM
5	Was not in the military in 2009.	5/31/2018 8:58 AM
6	The Cyber career field is so broad, it's difficult to know what you will be working on at each base, let alone to get the appropriate training, much is OJT and throwing you into the fire.	5/24/2018 3:28 PM
7	there was no training provided for those SSgt / TSgt's that merged from a different AFSC. Most of these individuals had no prior networking experience and the learning curve was high.	5/24/2018 10:20 AM
8	I was not enlisted at the time of the merger to have any effect on me.	5/22/2018 12:46 PM
9	All my supervisors came from a wide range of jobs so theyre unable to train me on modern day equipment. 3d1x2 has become a catch all for a bunch of garbage so there is a lot to learn.	5/22/2018 12:41 PM
10	I feel that the merger separated career fields that need to be combined to function appropriately. Currently we have to cross utilize to meet the objectives of OJT and UTC training that we achieved seamlessly prior to the merger.	5/22/2018 10:05 AM
11	A 3DXXX in a combat comm will have trouble adjusting to the wide range of skillsets required with the limited amount of technicians that make up a typical comm package.	5/22/2018 12:58 AM

Q65 Please provide any final comments you may have about combat communications training.

Answered: 9 Skipped: 58

#	RESPONSES	DATE
1	Training in Combat Comm seems to be overlooked because we are not a real squadron. Everything we do home station is fake.	6/1/2018 5:05 PM
2	The manning and the climate of the combat comm in general. Like, working on training is good, but if you have 6 well trained people so burnt out that the thought of staying in the military makes them ill, you might have a bigger issue than the training.	6/1/2018 10:25 AM
3	The honest truth is we focus to much on things that do not matter and not enough time on training. Our only mission at home station should be training and getting ready for the next deployment. However, we manage to do everything but training. In addition, Combat Communications is not a good place for 3 level to cut their teeth. This should be a 5 level and higher restricted assignment. Doing this would have two effects. One personnel would show up already 5 level qualified and be ready to go out the door. Two this would alleviate the current problem we have with technicians that do not know how to work on a live network. If personnel are arriving from other duty stations where they were base communications they will have the knowledge base built already. It will be much easier to train personnel on Combat Communications specific equipment and network layout with the knowledge base already built.	5/31/2018 2:16 PM
4	Time, personnel, and training.	5/31/2018 8:58 AM
5	We don't need to be out in the field training or pulling 12 hour shifts to learn the equipment. Having a respectable communication's lab to work on the equipment. Have networking lab programs for members to train both virtually and then apply in real-life in the training lab if so desired.	5/24/2018 2:33 PM
6	I feel the unit does have the idea to improve training but as you go down the overall chain of command the want and desire to train the Airmen diminishes.	5/23/2018 9:52 AM
7	We don't receive training. Everything I have learned is because I sat down on my own and forced myself to learn it.	5/22/2018 12:43 PM
8	Training and Equipment should be our focus to be prepared for our unique mission. Without the proper guidance (i.e. TO's) and SME support from PMO our trainees & trainers are left with doing extensive research to correct issues that should already come with potential solutions. This degrades our mission capabilities greatly when we constantly have to troubleshoot during a setup. We place a lot of pressure on our 3 levels while we lack enough 5/7 levels to prepare them or they are working issues outside of their AFSC. 3 level's initial focus should be CDC's and OJT. This will prevent failures and they will be better prepared for the demands of UTC qualification.	5/22/2018 10:13 AM
9	A legacy 3CXXX AFSC is what combat communications needs to successfully execute the mission.	5/22/2018 1:00 AM

Appendix C

Faculty Acceptance

School of Science, Technology, Engineering, and Math

Information Technology

The thesis for the master's degree submitted by

Joshua Tyler Larson

under the title

Entry Level Training for Combat Communications Personnel

has been read by the undersigned. It is hereby recommended

for acceptance by the faculty with credit to the amount of

3 semester hours.

(Signed, first reader) _____ (Date) _____

(Signed, second reader, if required) _____ (Date) _____

Recommended for approval on behalf of the program

(Signed) _____(Date) _____

Recommendation accepted on behalf of the

program director

(Signed) _____ (Date) _____

Approved by academic dean

Appendix D

Copyright Use

11 Jun 2018

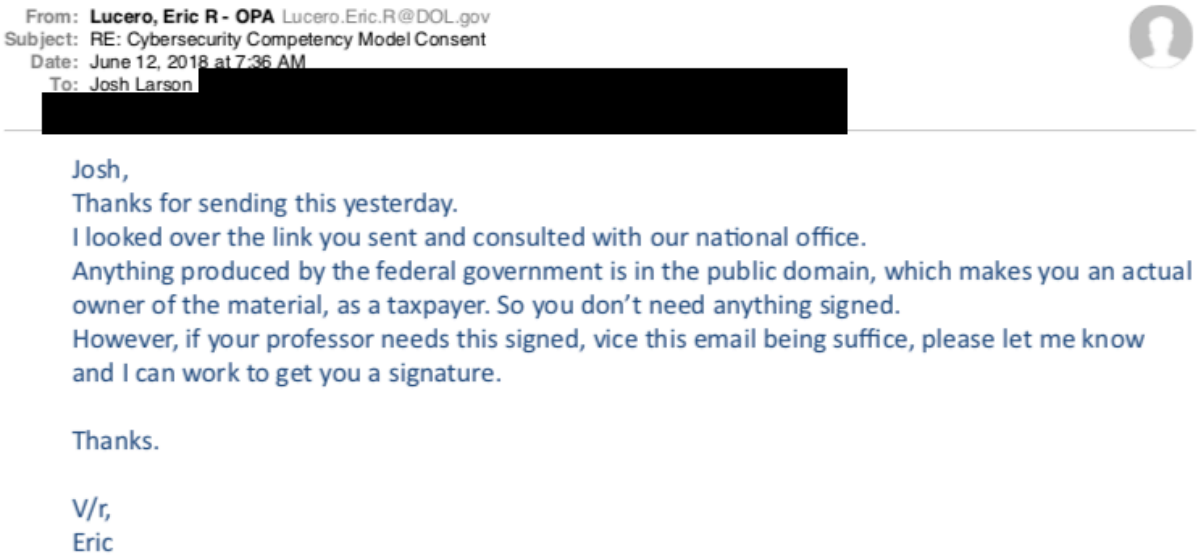
I, Dr. Panayotis Yannakogeorgos, owner of the copyright to the work known as *The Human Side of Cyber Conflict*, hereby authorize Josh Larson to use the following material as part of his thesis to be submitted to American Public University System.

Page: 149

Graphic: Cyber tasks at levels of Bloom's Taxonomy

YANNAKOGEORGOS.PANAYOTIS.A.1401809836 Digitally signed by YANNAKOGEORGOS.PANAYOTIS.A.1401809836 Date: 2018.06.11 14:49:39 -05'00'

Dr. Panayotis Yannakogeorgos



From: **Lucero, Eric R - OPA** Lucero.Eric.R@DOL.gov
Subject: RE: Cybersecurity Competency Model Consent
Date: June 12, 2018 at 7:36 AM
To: Josh Larson [redacted]

Josh,
Thanks for sending this yesterday.
I looked over the link you sent and consulted with our national office.
Anything produced by the federal government is in the public domain, which makes you an actual owner of the material, as a taxpayer. So you don't need anything signed.
However, if your professor needs this signed, vice this email being suffice, please let me know and I can work to get you a signature.

Thanks.

V/r,
Eric

From: **Wolfkill, Timothy J CIV OSD DOD CIO (US)** timothy.j.wolfkill.civ@mail.mil
Subject: RE: [Non-DoD Source] 8570.01-M Graphic Consent to Use
Date: June 12, 2018 at 8:27 AM
To: Josh Larson [redacted]
Cc: [redacted]

Capt Larson,

Second reply on same.

I just reviewed your request with Mr. White and we both looked at the manual and the graphic. Per the following statement within the cited manual it is a "public releasable" document so you may download and use content from the manual (with correctly annotated citation of the source).

It reads: "The DoD Components, other Federal agencies, and the public may download this Manual from the DoD Issuances Web Site at http://www.dtic.mil/whs/directives."

A direct link to the manual is:
http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/857001m.pdf

There is no need for a signed release statement.

Thanks, R/

Mr. Tim Wolfkill
Correspondence Chief
Correspndence Control Office (CCO)
DoD Chief Information Officer (DoD CIO)
PTN Room 3D1048
PH: (703) 695-6402
NIPR: timothy.j.wolfkill.civ@mail.mil
SIPR: timothy.j.wolfkill.civ@mail.smil.mil
JWICS: timothy.wolfkill@osdj.ic.gov

Appendix E

IRB Approval

Institutional Review Board (IRB)

Application Number: 2018-095

Application Title: Entry Level Skills Training For Air Force Combat Communications Personnel

05/21/2018

Dear joshua larson8,

The APUS IRB has reviewed and approved the above application as Exempt from further review.

Date of IRB approval: 05/21/2018

Date of IRB approval expiration: 05/20/2023

The approval is valid for five calendar years from the date of approval. Should your research using human subjects extend beyond the time covered by this approval, you will need to submit an *extension request form* to the IRB.

Changes in the research design (e.g., recruitment process, advertisements) or informed consent process must be approved by the IRB before they are implemented. If the revised research design is no longer Exempt, then the IRB committee will need to review the application and issue a new approval.

It is the responsibility of the investigators to report to the IRB any serious, unexpected, and related adverse events and potential unanticipated problems related to risks to subjects and others using the *unanticipated problems notification*.

Please direct any question to apus-irb@apus.edu. The forms mentioned above are available at http://www.apus.edu/community-scholars/institutional-review-board/apply.htm.

Sincerely,

Jennifer Douglas, PhD
IRB Chair

Corporate and Academic Offices:
111 W. Congress Street, Charles Town, WV 25414
Phone: 304-724-3700 • Toll Free 877-468-6268 • Fax: 304-724-3780

www.apus.edu

Administrative Offices:
10648 Wakeman Court, Manassas, VA 20110
Phone: 703-330-5398 • Toll Free 877-468-6268 • Fax: 703-330-5109

Appendix F

Letters from Commanders

7 May 2018

American Public University System (APUS)
Institutional Review Board, IRB Chair
111 W. Congress Street
Charles Town, WV 25414

Dear APUS IRB Chair:

As the Commander of the 1st Combat Communications Squadron, I grant permission for Josh Larson to conduct human subject research by sending out electronic surveys to my organization. Further, the 1st CBCS acknowledges that the results of this research will be used to fulfill the requirements for a master's thesis at American Public University System.

Sincerely,

IN.THAROMMONY.T.1158175416 Digitally signed by IN.THAROMMONY.T.1158175416 Date: 2018.05.21 07:46:19 +02'00'

Tharommony In
1st Combat Communications Squadron
tharommony.in@us.af.mil

7 May 2018

American Public University System (APUS)
Institutional Review Board, IRB Chair
111 W. Congress Street
Charles Town, WV 25414

Dear APUS IRB Chair:

As the Commander of the 5th Combat Communications Support Squadron, I grant permission for Josh Larson to conduct human subject research by sending out electronic surveys to my organization. Further, the 5th CBCSS acknowledges that the results of this research will be used to fulfill the requirements for a master's thesis at American Public University System.

Sincerely,

Alexander Koutsoheras
5th Combat Communications Support Squadron
alexander.koutsoheras@us.af.mil

7 May 2018

American Public University System (APUS)
Institutional Review Board, IRB Chair
111 W. Congress Street
Charles Town, WV 25414

Dear APUS IRB Chair:

As the Commander of the 51st Combat Communications Squadron, I grant permission for Josh Larson to conduct human subject research by sending out electronic surveys to my organization. Further, the 51st CBCS acknowledges that the results of this research will be used to fulfill the requirements for a master's thesis at American Public University System.

Sincerely,

Christopher Dauer
51st Combat Communications Squadron
christopher.dauer@us.af.mil

7 May 2018

American Public University System (APUS)
Institutional Review Board, IRB Chair
111 W. Congress Street
Charles Town, WV 25414

Dear APUS IRB Chair:

As the Commander of the 52d Combat Communications Squadron, I grant permission for Josh Larson to conduct human subject research by sending out electronic surveys to my organization. Further, the 52d CBCS acknowledges that the results of this research will be used to fulfill the requirements for a master's thesis at American Public University System.

Sincerely,

Nicholas Kuc
52d Combat Communications Squadron
nicholas.kuc@us.af.mil

7 May 2018

American Public University System (APUS)
Institutional Review Board, IRB Chair
111 W. Congress Street
Charles Town, WV 25414

Dear APUS IRB Chair:

As the Commander of the 644th Combat Communications Squadron, I grant permission for Josh Larson to conduct human subject research by sending out electronic surveys to my organization. Further, the 644th CBCS acknowledges that the results of this research will be used to fulfill the requirements for a master's thesis at American Public University System.

Sincerely,

LANDEZ.MARK.MATTHEW.1128774021 Digitally signed by LANDEZ.MARK.MATTHEW.1128774021 Date: 2018.05.09 09:38:27 +10'00'

Mark Landez
644th Combat Communications Squadron
mark.landez@us.af.mil

Appendix G

Letters to Participants

EMAIL TITLE: Time Sensitive: Request for Survey Participation

Good morning (Sir/Ma'am),

BLUF: Request your participation in a survey on entry-level Air Force technical training, located at the link below. The survey should take you less than 20 minutes to complete.

BACKGROUND: I am conducting research for my master's thesis at AMU, which looks at the effectiveness of the cumulative training that our 3D0X2's, 3D0X3's, and 3D1X2's receive prior to deploying with the 6K-series UTCs.

To collect the data, I am surveying our active duty combat communications 3D0X2's, 3D0X3's, and 3D1X2's on your viewpoints concerning the entry-level technical training you receive, and whether or not it adequately prepares you for the operational environment. Relative to the greater Air Force, there are very few 3D0X2's, 3D0X3's, and 3D1X2's across the active duty combat comm; your participation would be greatly appreciated, as it will help generate more accurate results from a limited data pool.

The survey is completely optional, anonymous, and should take you less than 20 minutes to complete. Although this survey is not sponsored by the USAF, the final thesis project may be made available to the public domain.

REQUESTED ACTION: Please take a few minutes to complete the below survey and provide your honest opinion of the career field training you have received thus far in the Air Force.

https://www.surveymonkey.com/r/2M637DV

Thank you,

Very Respectfully,

Josh Larson

Appendix H

Thesis Checklist

ITCC698 and ISSC699 Thesis Checklist

This is the checklist your instructor will use to assess your submission—please review!

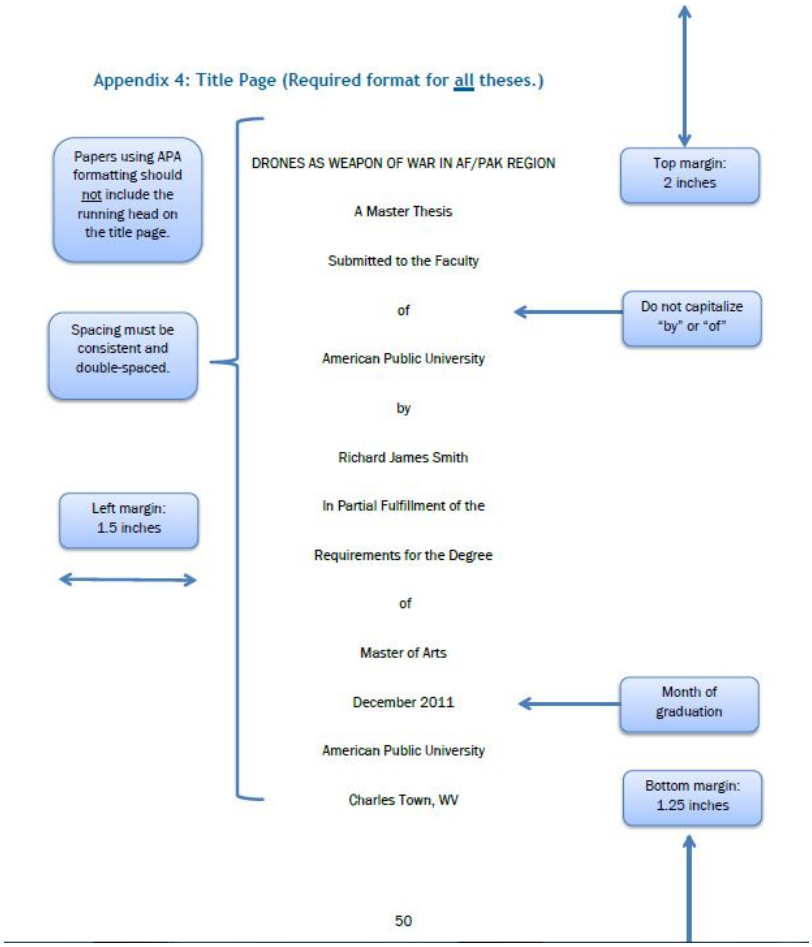
Please ensure your students provide the following in the paper before accepting as final paper!

Below is the comment extracted from the 2015 Capstone Manual:

The citation approach and manuscript formatting is established by the program or school's officially designated style manual; however, the following are required to follow the formats shown in Appendixes 4-8.

- Title page (required; Appendix 4) 3
- University Publication License /Copyright page (required; Appendix 5)
- Dedication page (if included; Appendix 6)
- Acknowledgements page (if included; Appendix 7)
- Abstract of the thesis (required; Appendix 8)

1. Capstone Title Page—see sample below:



Source: 2015 Capstone manual

2. **The title appears on each page in the header after the title page with only the page numbers changing in the right margin. Only use the number!**

3. **All letters of title are capitalized: LEARNING STYLES**
4. **Students must include a copyright page below the title page (see the example below):**

The author hereby grants the American Public University System the right to display these contents for educational purposes.

The author assumes total responsibility for meeting the requirements set by United States copyright law for the inclusion of any materials that are not the author's creation or in the public domain.

Appendix 5: Sample of Copyright Page (Required format for all theses.)

NOTES:
- Text should begin just after halfway down the page.
- This sample includes the exact language that must be used.

The author hereby grants the American Public University System the right to display these contents for educational purposes.

The author assumes total responsibility for meeting the requirements set by United States copyright law for the inclusion of any materials that are not the author's creation or in the public domain.

© Copyright 2012 by Richard James Smith

All rights reserved.

5. Dedication Page goes after the Copyright Page (See the example from the Capstone Manual below)

Appendix 6: Sample of Dedication Page (Required format for all theses.)

NOTES:
- Text should begin just after halfway down the page.
- Text should be double-spaced.

DEDICATION

I dedicate this thesis to my parents. Without their patience, understanding, support, and, most of all, love, the completion of this work would not have been possible.

6. The Acknowledgement page goes after the Dedication page (see the example below):

Appendix 7: Sample of Acknowledgments Page (Required format for all theses.)

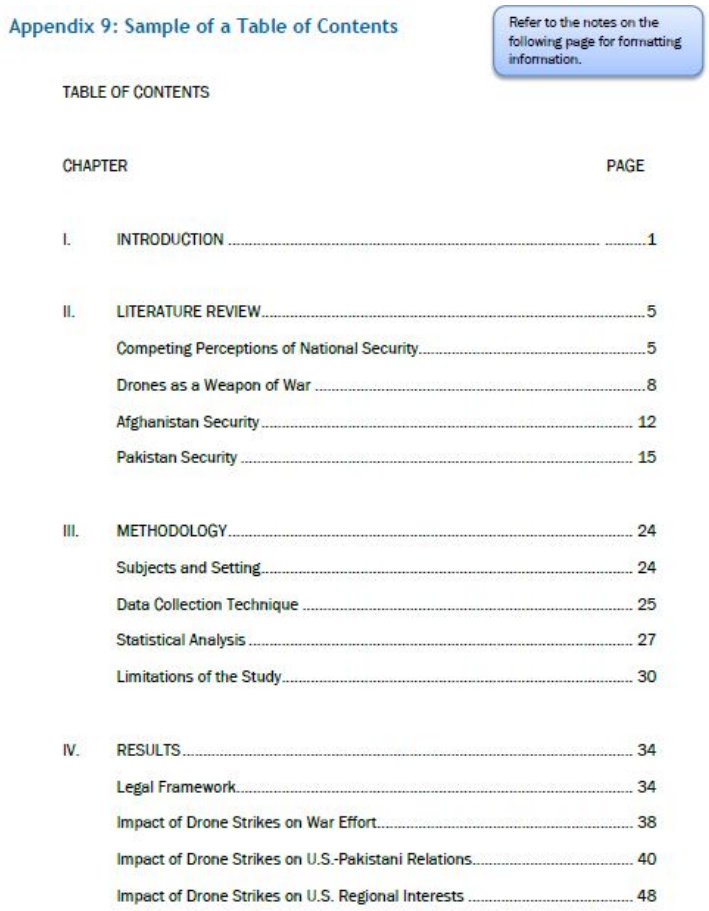
NOTES:
- Text should begin just after halfway down the page.
- Text should be double-spaced.

ACKNOWLEDGMENTS

I wish to thank the members of my committee for their support, patience, and good humor. Their gentle but firm direction has been most appreciated. Dr. Betty Morrow was particularly helpful in guiding me toward a qualitative methodology. Dr. Judith Slater's interest in a sense of competence was the impetus for my proposal. Finally, I would like to thank my major professor, Dr. Stephen Fain. From the beginning, he had confidence in my abilities to not only complete a degree, but to complete it with excellence.

I have found my course work throughout the national security program to be stimulating and thoughtful, providing me with the tools with which to explore both past and present ideas and issues.

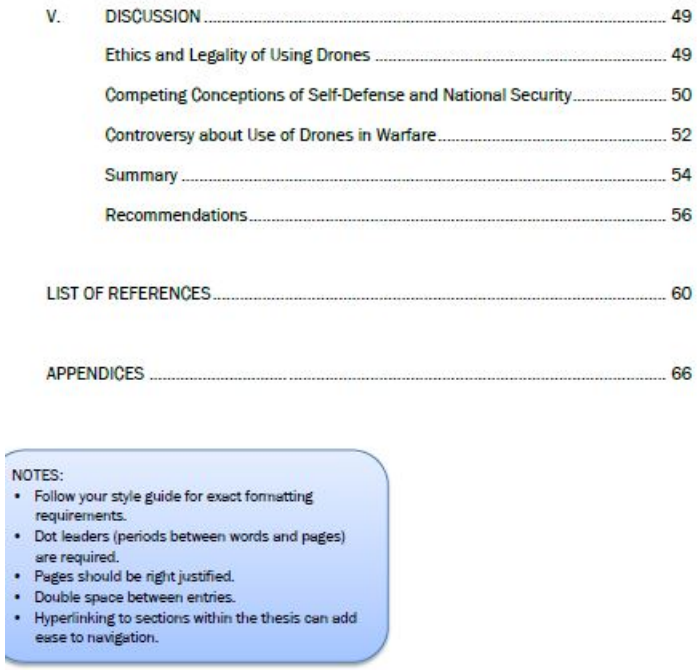
7. Table of Contents goes next. Below is an example:



Appendix 9: Sample of a Table of Contents

Refer to the notes on the following page for formatting information.

TABLE OF CONTENTS



NOTES:
- Follow your style guide for exact formatting requirements.
- Dot leaders (periods between words and pages) are required.
- Pages should be right justified.
- Double space between entries.
- Hyperlinking to sections within the thesis can add ease to navigation.

8. Below the Table of Contents is the List of Tables—please see the attached document for guidance.

TABLE/FIGURES

- Immediately after the Table of Contents, you should have a List of Tables, followed by a List of Figures.
- The List of Tables, List of Figures, and Abstract are front matter and should be numbered with lower case Roman numerals.
- Figures are labeled immediately beneath the figure and take this format:

  Figure 2.1 Rationale and organization of the Literature Review chapter
- Tables are labeled immediately above the table and take this format:
- Table 2.1

Phases in Gunawardena, Lowe & Anderson's (1997) Interaction Analysis Model (IAM)

Appendix 10: Sample of List of Tables

LIST OF TABLES

OTES:
Follow your style guide for exact formatting requirements.
Dot leaders (periods between words and pages) are required.
Pages should be right justified.
Double space between entries.
Hyperlinking to sections within the thesis can add ease to navigation.

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9. The List of Figures goes below the List of Tables. Please see the image below.

Appendix 11: Sample of List of Figures

LIST OF FIGURES

NOTES:
- Follow your style guide for exact formatting requirements.
- Dot leaders (periods between words and pages) are required.
- Pages should be right justified.
- Double space between entries.
- Hyperlinking to sections within the thesis can add ease to navigation.

10. Abstract goes after the List of Figures –See sample below:

Appendix 8: Sample of Abstract of the Thesis (Required format for all theses.)

ABSTRACT OF THE THESIS

DRONES IN NATO LED EFFORTS IN AF/PAK

by

Richard James Smith

American Public University System, July 1, 2007

Charles Town, West Virginia

Professor John Doe, Thesis Professor

Begin typing the abstract here, double-spaced. The abstract must include the following components: purpose of the research, methodology, findings, and conclusion. The body of the abstract is limited to 150-200 words (no less than 150 and no more than 200).

NOTE:
The abstract is a **required component** of the thesis/capstone paper. If you are not sure of what an abstract is or of how to write one, the APUS Center for Graduate Studies and the APUS Library have created an instructional module on *Writing the Abstract for Your Graduate Capstone Thesis at AMU/APU*, viewable at http://apus.campusguides.com/writing/thesiscapstone/abstract.

11. Remember to require the students to include the keywords at the end of the abstract! We will use the keywords for others to search the paper in the APUS Library.

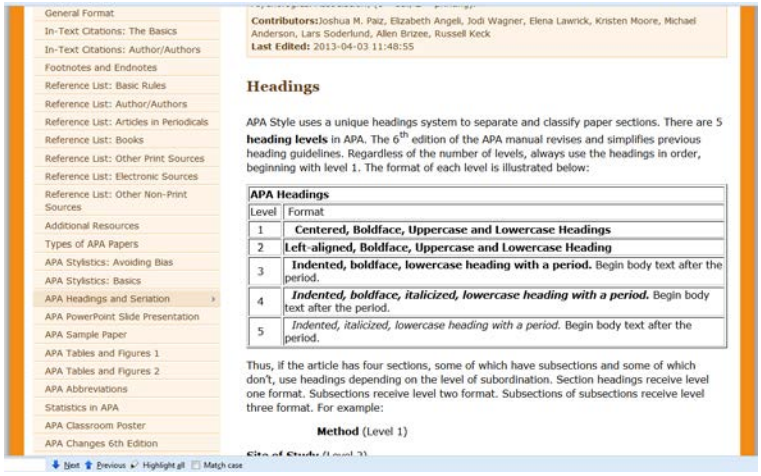
placerat vestibulum commodo. Nulla vitae arcu risus. Duis vel urna ut dolor pulvinar placerat. Aliquam sagittis pulvinar ultricies.

Keywords: lorem ipsum, nulla vitae

12. Introduction goes after the Abstract. Be sure the students include all of the following using level 2 heading:

- **The background of the topic**
- **Statement of the problem**
- **Statement of the purpose**
- **Research questions**
- **Significance of the study**
- **Definitions of unclear terms**
- **Limitations/delimitations (you may also provide in the Methodology area as well)**
- **Assumptions**

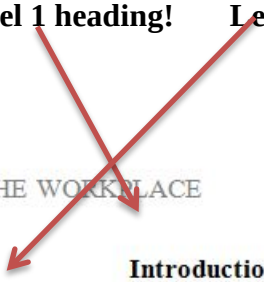
13. **Require the students to use the appropriate level headings for their paper. For all major headings, use level 1, use level 2 for main points and use level 3 for subpoints—see image.**



Source: Purdue OWL

See the sample below:

This is an example of Level 1 heading! **Level 2 heading!**



Introduction

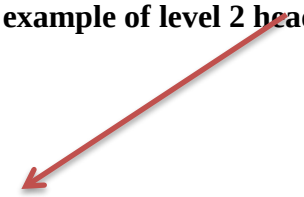
Background of the Problem

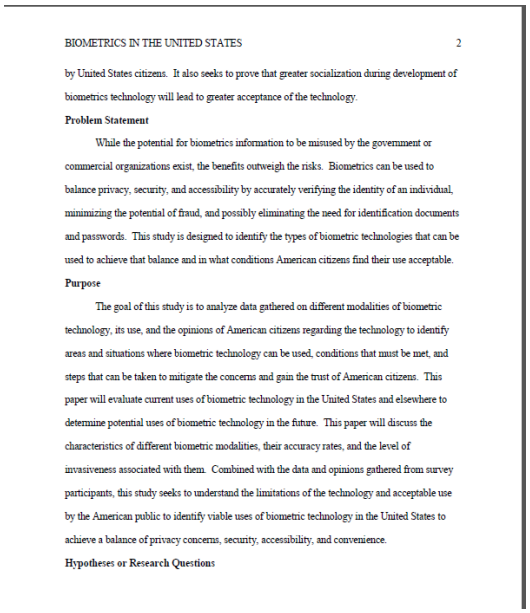
When it comes to security policies, there are a few problems that most organizations have. These problems all contribute to the overall failure of the company. Even though in the market, the company can be successful, sooner or later, the organization will begin to crumble from the inside.

Statement of the Problem

There are several problems with security policies within organizations. Some of these problems include:

This is an example of level 2 heading!





BIOMETRICS IN THE UNITED STATES 2

by United States citizens. It also seeks to prove that greater socialization during development of biometrics technology will lead to greater acceptance of the technology.

Problem Statement

While the potential for biometrics information to be misused by the government or commercial organizations exist, the benefits outweigh the risks. Biometrics can be used to balance privacy, security, and accessibility by accurately verifying the identity of an individual, minimizing the potential of fraud, and possibly eliminating the need for identification documents and passwords. This study is designed to identify the types of biometric technologies that can be used to achieve that balance and in what conditions American citizens find their use acceptable.

Purpose

The goal of this study is to analyze data gathered on different modalities of biometric technology, its use, and the opinions of American citizens regarding the technology to identify areas and situations where biometric technology can be used, conditions that must be met, and steps that can be taken to mitigate the concerns and gain the trust of American citizens. This paper will evaluate current uses of biometric technology in the United States and elsewhere to determine potential uses of biometric technology in the future. This paper will discuss the characteristics of different biometric modalities, their accuracy rates, and the level of invasiveness associated with them. Combined with the data and opinions gathered from survey participants, this study seeks to understand the limitations of the technology and acceptable use by the American public to identify viable uses of biometric technology in the United States to achieve a balance of privacy concerns, security, accessibility, and convenience.

Hypotheses or Research Questions

14. The 25 Pages or More Literature Review goes after the Introduction (note the comments taken from the Capstone Manual)

Literature Review: Reviews the literature on a specific research question. The literature review focuses on discussing how other researchers have addressed the same or similar research questions. It introduces the study and places it in larger context that includes a discussion of why it is important to study this case. It provides the current state of accumulated knowledge as it relates to the student's specific research question.

• Summarize the general state of the literature (cumulative knowledge base) on the specific research question: o Study one: summarize to include researcher's findings, how those findings were obtained, and evaluation of biases in the findings.

o Study two: summarize to include researcher's findings, how those findings were obtained, and evaluation of biases in the findings.

o Include a minimum of at least three of the most important studies.

• Include a short conclusion and transition to the next section.

15. Remind the students to use the level 1 and level 2 heading!

SECURITY POLICIES IN THE WORKPLACE 16

Literature Review

According to Rouse (2007), a security policy is defined as a document that is prepared by an organization which details the decided upon plan to protect the organization's information technology and physical assets. According to SANS (2013), security policies are defined as being well written plans of action on how organizations intend to maintain and protect the availability of resources to its network. Organizations created security policies for many reasons to cover a wide variety or problems that may or may not be experienced. Some of the areas security policies are created to address are:

- Intrusion detection
- Disaster recovery plan (restore and backup)
- Internet policies
- Email policies
- User responsibilities
- Administrative responsibilities
- Password policies
- Risk assessments
- Physical security design

Physical Security Policies

Every organization needs to have detailed physical security policies to ensure the protection of all assets, information technology and physical, are protected against malicious

16. After the Literature Review, the Research Design/Methodology comes next.

Hypotheses or Research Questions: The students are expected to restate hypotheses research questions for the reader in the Methodology section.

Data Collection: The intent of this section is for the students to explain what they did to collect their data. It is intended for them to explain what they did to carry out the full study in the capstone course. **For example, what instrument did they use? What documents did they use if conducting a document analysis?**

Sampling: Students are to use this section to explain the population or sample used for the study and why.

Summary of Analysis Procedures: The goal of this section is for students to provide a summary of how they analyzed the data collected using descriptive statistics (Mean, Median and Mode), frequency distribution, T-test, ANOVA, Chi Square, Correlation, etc.

OR

For the qualitative portion, how they used any of the following for their analysis: CHARTING, CODING, CATEGORIZING, AND MODELING. The goal is for the students to make this process clear to the reader!

The Capstone Manual explains,

Research Design/Methodology: Describes how the student will test the hypothesis and carry out his/her analysis. This section describes the data to be used to test the hypothesis, how the student will operationalize and collect data on his/her variables, and the analytic methods that to be used, noting potential biases and limitations to the research approach. It should include

- identification and operationalization (measurement) of variables;
- a sampling plan (i.e., study population and sampling procedures, if appropriate);
- justification of case studies used;
- data collection/sources (secondary literature, archives, interviews, surveys, etc.);
- a summary of analysis procedures (pattern-matching, etc.); and
- the limitations of study and bias discussion.

17. **After the Research Design/Methodology, the Results section comes next, note the requirements from the Capstone Manual.**

Findings/Results/: This section describes the results of the study. Keep in mind that the "results" are the direct observations of the research, while the "discussion" is the interpretation of the results and research. This should include, as appropriate:

• results, including tables, graphs, statistics;

• significance and interpretation of the results;

Use a table or model to map relationships. Note, the intent of the Results section is to provide data, charts, figures, tables, and models and not much narrative content. Students should save the bulk of the explanation for the Discussion Section.

The purpose of a Results section is to present the key results of your research without interpreting their meaning. Organize the data in the Results section in either chronological order according to the Methods or in order of most to least important. Within each paragraph, the order of most to least important results should be followed.

3. Determine whether the data are best presented in the form of text, figures, graphs, or tables.

4. Summarize your findings and point the reader to the relevant data in the text, figures and/or tables. The text should complement the figures or tables, not repeat the same information.

11. Provide a heading for each figure and table. Depending on the journal the table titles and figure legends should be listed separately or located above the table or below

the figure. Each figure and table must be sufficiently complete that it could stand on its own, separate from the text.

12. Write with accuracy, brevity and clarity. (“San Francisco Edit,” n.d., para. 1, 4-5, 12-13).

Source:

San Francisco Edit. (n.d.).Twelve steps to writing an effective results. Retrieved from Sectionhttp://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CB8QFjAA&url=http%3A%2F%2Fwww.sfedit.net%2Fresults.pdf&ei=CjtDVbeOF8LFgwSijIHwBg&usg=AFQjCNEstM5xaiYa5Fa_l-zKduZx0096rQ&sig2=4vpEzBeP5MlD-aUc3REOLw&bvm=bv.92189499,d.eXY

18. **After the Results section, the Discussion section comes next, note the requirements from the Capstone Manual.**

• discussion of results as they relate to thesis statement/research question;
• discussion of results as it relates to the theoretical framework/approach; and
• directions for future research.

The purpose of the Discussion is to state your interpretations and opinions, explain the implications of your findings, and make suggestions for future research. Its main function is to answer the questions posed in the Introduction, explain how the results support the answers and, how the answers fit in with existing knowledge on the topic. The Discussion is considered the heart of the paper and usually requires several writing attempts.

3. Begin by re-stating the hypothesis you were testing and answering the questions posed in the introduction.

4. Support the answers with the results. Explain how your results relate to expectations and to the literature, clearly stating why they are acceptable and how they are consistent or fit in with previously published knowledge on the topic.

6. Describe the patterns, principles, and relationships shown by each major finding/result and put them in perspective. The sequencing of providing this information is important; first state the answer, then the relevant results, then cite the work of others. If necessary, point the reader to a figure or table to enhance the “story”.

7. Defend your answers, if necessary, by explaining both why your answer is satisfactory and why others are not. Only by giving both sides to the argument can you make your explanation convincing.

8. Discuss and evaluate conflicting explanations of the results. This is the sign of a good discussion.

9. Discuss any unexpected findings. When discussing an unexpected finding, begin the paragraph with the finding and then describe it.

10. Identify potential limitations and weaknesses and comment on the relative importance of these to your interpretation of the results and how they may affect the validity of the findings. When identifying limitations and weaknesses, avoid using an apologetic tone.

11. Summarize concisely the principal implications of the findings, regardless of statistical significance.

12. Provide recommendations (no more than two) for further research. Do not offer

suggestions which could have been easily addressed within the study, as this shows there has been inadequate examination and interpretation of the data.

13. Explain how the results and conclusions of this study are important and how they influence our knowledge or understanding of the problem being examined. ("San Francisco Edit," n.d., para. 1,6-7, 9-16).

San Francisco Edit. (n.d.). Fourteen steps to writing an effective discussion section. Retrieved from http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CB8QFjAA&url=http%3A%2F%2Fwww.sfedit.net%2Fdiscussion.pdf&ei=8T5DVca2Hse0ggStgYGACA&usg=AFQjCNFL8hPk8Hdrr7D3YYTVfJv_RGLzHA&sig2=tEhheXywoWZ1H-s8XrLMrg&bvm=bv.92189499,d.eXY

19. **The Reference List comes after the Summary and Recommendations, note from the Capstone Manual:** ***Reference List:*** This section should reference the works cited (direct quotes or paraphrases).

20. **The Appendix of the Survey or other supporting documents such as the IRB Approval letter for using Animals or Human Subjects in the data collection are required after the list of references (see the image from the Capstone Manual below):**

Appendix 15: Sample of IRB Approval Letter

American Public University System
American Military University | American Public University
Institutional Review Board (IRB)

1 April 2013

Dear John Smith,

The APUS IRB has reviewed and approved your application (submitted 4/6/2013). The approval covers one calendar year. Should you need an extension beyond the one year timeframe, an extension request will have to be submitted. However, this does not mean your research must be complete within the one year time frame. Should your research using human subjects extend beyond the time covered by this approval, you will need to submit an extension request to the IRB.

Sincerely,

Patricia J. Campbell
Chair, IRB

21. Permission to Quote or Reproduce Copyrighted Material Letter comes after the Reference List. Please require all students to sign this document before you give them the final thesis or creative project grade.

Appendix 12: Sample of Permission to Quote or Reproduce Copyrighted Material Letter

Date_____

I (we) _____ owner(s) of the copyright to the work known as _____ _____ hereby authorize _____ to use the following material as part of his/her thesis to be submitted to American Public University System.

Page Line Numbers or Other Identification

_____

Signature

22. The Capstone Checklist with your signature is required for all papers(Send this document with the students' papers to the PD for signature).

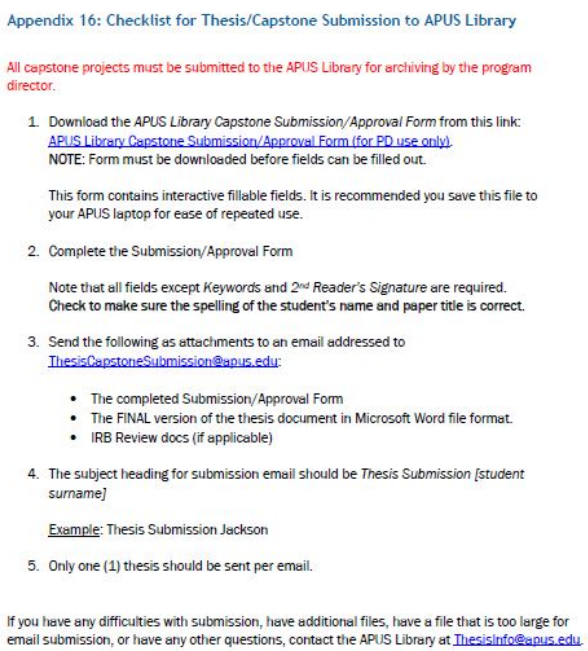
APUS Library Capstone Submission Form

This capstone has been approved for submission to and review and publication by the APUS Library.

Student Name [Last, First, MI] *			
Course Number [e.g. INTL699] *		**Paper Date** [See Title pg.]	
Professor Name [Last, First] *			
Program Name * See list			
Keywords [250 character max.]			
Passed with Distinction * Y or N			
Security Sensitive Information * Y or N			
IRB Review Required * Y or N		If YES, include IRB documents in submission attachments.	
Turnitin Check * Y or N		All capstone papers must be checked via Turnitin.	

* Required

Capstone Approval Document



Appendix 16: Checklist for Thesis/Capstone Submission to APUS Library

All capstone projects must be submitted to the APUS Library for archiving by the program director.

1. Download the *APUS Library Capstone Submission/Approval Form* from this link: APUS Library Capstone Submission/Approval Form (for PD use only).
   NOTE: Form must be downloaded before fields can be filled out.

   This form contains interactive fillable fields. It is recommended you save this file to your APUS laptop for ease of repeated use.

2. Complete the Submission/Approval Form

   Note that all fields except *Keywords* and *2nd Reader's Signature* are required.
   Check to make sure the spelling of the student's name and paper title is correct.

3. Send the following as attachments to an email addressed to ThesisCapstoneSubmission@apus.edu:

   - The completed Submission/Approval Form
   - The FINAL version of the thesis document in Microsoft Word file format.
   - IRB Review docs (if applicable)

4. The subject heading for submission email should be *Thesis Submission [student surname]*

   Example: Thesis Submission Jackson

5. Only one (1) thesis should be sent per email.

If you have any difficulties with submission, have additional files, have a file that is too large for email submission, or have any other questions, contact the APUS Library at ThesisInfo@apus.edu.

APA Checklist

1. Double space entire paper/Use 1 inch margin/Text is to be left aligned.

2. **Use 12 point font/ New Times Roman/black ink.**

3. Same font throughout with the exception of italicizing: (1) key term to emphasize (2) titles of books, periodicals, films, videos, TV shows and microfilm publications (there are more in-depth examples in APA Manual section 4.21).

4. Numbers: 0-9 are written out while 10 and above are written as numbers (Exceptions: numbers expressing approximate lengths of time written as words ex: 1 hr 30 min; 12:30 a.m.; about 3 months ago).

5. Punctuation when ending a Quote**:** If quotation is at the **end** of a sentence, close quote with quotation marks, cite the source in parentheses, and end with a period or other punctuation outside the final parenthesis.

6. Avoid using “etc.” at the end of a list or exclamation point unless it is part of the quotation.

7. Ampersand: If the citation is in parentheses, use the ampersand ('&') instead of the word “and” in text of paper. Always use ampersand (&) in tables, captions and on reference page.

8. Capitalize first letter following a colon if clause is a complete sentence.

9. Use complete sentences and avoid slang. Use Spell Checker and proofread paper.

10. First sentence of a paragraph must be indented (with the exception of the Abstract).

11. Do not use contractions (it's = it is; won't = will not).

12. Always spell out acronym on first use. Example: APU = American Public University.

13. Direct Quotes: must give page number. If no page numbers available, cite paragraph number using abbreviation *para*. (para. 4). If no page or paragraph numbers, cite heading and paragraph number where information found: (Discussion section, para. 2).

14. Spell out all authors' first time reference is cited. Use et al. in further references (ex: Smith et al., 2009) (Exception: Six or more authors use et al. first time).

15. Quotes over 40 words must be indented and page number cited. Do not use quotation marks.

16. The reference page is the last page (unless appendix). Insert page break at end of text preventing distortion when edits are made.

17. Title of page: References (centered on page directly under the 1” margin). Do not underline, italicize or make bold.

18. Cite references in text of paper and include sources on reference page. PLEASE NOTE: Wikis (like Wikipedia) cannot guarantee the verifiability or expertise of entries, therefore, are not considered scholarly sources. DO NOT USE WIKIPEDIA AS A SOURCE.

19. References are in alphabetical order by author(s) last name on the reference page; list last name, then first and middle initial (if applicable) only. If no author is provided, use the first character of the title.

20. When citing a book on the reference page, capitalize the first word of the title only (with the exception of proper names). Also, italicize the name of the book.

21. In reference area, capitalize the FIRST word, the word after a colon, and all proper names in the title of books and articles.

22. Italicize the name of books, journals, and magazines, but do NOT italicize the name of the article.

23. Do not use the words Volume or Vol., Issue or Iss,. or Pages, p. or pp. on reference page.

24. The name of the journal and volume number are italicized. Pay attention to punctuation.

    Remove hyperlink. When the web addresses turn blue and get underlined, right click them and “remove hyperlink”.

25. Citing a source within a source (secondary sources) example: In-text—Bennett (as cited in Rudman, 1999) defined…

    Reference list: Rudman, R. (1999). Human resources management in New Zealand. (3rd ed.). Auckland, N.Z.:Addison Wesley Longman

26. Citing references on reference page: use the hanging indent. Highlight the citations and press Ctrl T automatically formats.

27. For electronic references, give the DOI, if assigned. DOI's always begin with the number 10. Database names are no longer needed. If no DOI assigned, provide the URL of the journal or book publisher.

    - Search for a DOI: Go to a free DOI lookup http://www.crossref.org/guestquery/ or http://www.crossref.org/SimpleTextQuery/
    - Verifying a DOI: CrossRef.org and type in DOI (e.g., 10.1037/a0015859)

28. Use 3rd person point of view (unless opinion paper) avoiding pronouns such as *I, we, my, our* (1st person) and *you, yours, your, us, we* (2nd person). Deal with facts, thus, providing citations within paper and reference page. Focus on subject; not feelings about the subject. The use of 3rd person retains a formal tone: Academic writing is more formal than casual conversation.

29. Cite all references in paper AND on reference page. If listed on reference page MUST have cited within paper.

30. No retrieval dates or database name needed on reference page.

Source:

Helpful APA Tips for Students (n.d.) Retrieved from https://edgetest.apus.edu/portal/site/b1ab5790-49c3-40e0-8b6e-08451f8e0d6d/page/432ae502-ee76-47e0-9e6d-af41c5f1a755