ANALYSIS OF CULTURAL TRAINING EFFORTS, COMPETENCIES AND IMPLICATIONS, AND HOW CROSS-CULTURAL COMPETENCY AFFECTS THE SUCCESS OF CONSTRUCTION PROJECTS ON AIR FORCE INSTALLATIONS OVERSEAS

THESIS

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Presented to the Faculty

Department of Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Fulfillment of the Requirements for the

Degree of Master of Science in Engineering Management

Katie L. MacGregor
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February 2019

DISTRIBUTION UNLIMITED

AFIT Graduate School of Engineering and Management
Thesis / Dissertation Committee Approval Signature Page

Designator Number AFIT-ENV-MS-19-M-186

Title **ANALYSIS OF CULTURAL TRAINING EFFORTS, COMPETENCIES AND IMPLICATIONS, AND HOW CROSS-CULTURAL COMPETENCY AFFECTS THE SUCCESS OF CONSTRUCTION PROJECTS ON AIR FORCE INSTALLATIONS OVERSEAS**

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Abstract

US Air Force (AF) Civil Engineer (CE) Officers stationed at overseas bases lead and manage construction and engineering efforts for projects totaling billions of dollars annually. Budget overruns in the Department of Defense (DoD) and specifically the AF, have been under stringent investigation by government officials in recent years. 92% of CE Officers overseas work with local nationals (LN) and the host nation weekly or daily, but most receive less than 2 hours of formal cross-cultural training prior to arrival overseas. Host nation partners include foreign military, local contractors, LN workforce and local government agencies. Based on a previous Delphi study, 60% of officers received some sort of cultural training, the majority of which was administered via Computer Based Training (CBT) or on the job training (OJT). Of those that received training, 40% felt it was inadequate to prepare them for their job duties. This second iteration, two survey study aims to better understand where cross cultural competence (3C) gaps lie for AF CE Officers. The first study is given to CE Officers with recent overseas experience and the second given to host nation partners at overseas bases. This research investigates the negative impacts on construction project success in overseas base locations due to a lack in 3C. The study also includes a thorough investigation of current practices and available resources. The goal is to inform the AF Language, Reginal Expertise and Culture (LREC) training implementation process, an initiative set out by the AF Chief of Staff in 2012. The implications of this study will not only help better prepare CE Officers, and the alike, to perform duties overseas, but also promote a healthy environment when working with host nation partners around the world furthering the AF mission.

Dedication

This was by far the most difficult page to write.
Mom, I could never have asked for a better mother, best friend, mentor and now, guardian angel.
Thank you for supporting me, teaching me, preparing me…you've inspired me to never quit and to know that no matter what, "it's going to be okay".

Acknowledgments

"It always seems impossible until it's done" – Nelson Mandela

I want to thank my thesis advisor for supporting me throughout the year with the resources and knowledge to keep me on track while also allowing me to enjoy my research. I want to thank my committee members for taking the time to provide crucial leadership input which made this thesis possible. While I thought the last 18 months was about data and methods and statistics, it turns out I also learned a great deal about leadership, teamwork, friendship, innovation and life. Thank you.

Katie L. MacGregor

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ANALYSIS OF CULTURAL TRAINING EFFORTS, COMPETENCIES AND IMPLICATIONS, AND HOW CROSS-CULTURAL COMPETENCY AFFECTS THE SUCCESS OF CONSTRUCTION PROJECTS ON AIR FORCE INSTALLATIONS OVERSEAS

I. INTRODUCTION

"Wars are won as much by creating alliances, leveraging nonmilitary advantages, reading intentions, building trust, converting opinions, and managing perceptions –all these tasks demand an exceptional ability to understand people, their culture, and their motivation."

– Major General Robert H. Scales

General Issue and Background

Economic globalization is affecting construction and changing the way we view traditional engineer and construction management roles (Soibelman et al., 2011). Construction managers and engineers, now more than ever, are completing projects worldwide with diverse teams combining members of different values, attitudes and cultures. These projects are being designed and implemented using unique location specific construction practices, materials, methods and logistic chains. Although having many personality types on a team can increase creativity and build higher functioning teams, in some circumstances diversity creates conflicts that can lead to project failures

(Colquitt, Jason M.; LePine, Jeffery; Wesson, 2013). These challenges are evident when researching and understanding the roles of our degreed US Air Force (AF) Civil Engineers (CE), who plan and manage billions of dollars of construction around the globe. They move every few years without the option to master a location's construction scene or culture. This study aims to understand the current requirements, needs and availability of cultural training for military stationed overseas. The study will examine the most common obstacles during foreign construction projects through the lens of AF CE Officers and the local nationals (LN) that work alongside them. This thesis proposes that by increasing AF construction and engineering leadership's cross-cultural competence, the AF will see a greater return on investment of taxpayer dollars on construction and facility sustainment operations overseas. The goal is to provide the AF with cultural training recommendations for AF CE Officers which may also be applicable for others.

The concept of successful construction is difficult to define, but project completion relies heavily on thriving relationships, communication and teamwork (T. Williams, 2016). The AF defines culture as the creating, maintenance and transformation across generations of shared patterns of meaning, affiliation, action and organization by groups (AFCLC, 2017). Cross-cultural competence (3C) is not a new topic to the military or industry. Implications of lacking 3C and its effects specifically on AF construction have yet to be examined. Individuals' cultural value orientations influence the way they interpret and process information. This can have large impacts on how a team works together and how team projects are accomplished (Lonner, et al., 1980). For example, team members on a multinational engineering team might be hesitant to share knowledge

and ideas with members of different cultural backgrounds because of lack of rapport and trust. Team conflicts might take on cultural undertones, rendering it difficult for the team to build cohesion or be high performing (Cheng, Chua, Morris, & Lee, 2012). These issues can have lasting impacts on construction and engineering projects, which rely so heavily on multiple disciplines and combined efforts.

The views gathered in this two-part study are from both experienced Civil Engineer (CE) Officers and host nation personnel that regularly work together on military construction and engineering projects. Chapter 2 covers an in-depth literature review surrounding the topic to include behavioral organization techniques for cross-cultural teams, industry practices and perspective on multi-cultural construction teams, and suggested cross-cultural training techniques for today's engineers. Chapter 3 covers the methodology used in the study, which includes the distribution of two surveys and a JMP statistical analysis. Chapter 4 shares the results and an analysis of the implications and applicability of the data derived. Chapter 5 concludes with overall findings and recommendations, as well as areas for possible future research.

This study focuses on AF CE Officers because of their diverse perspectives and experience, the uniqueness and scale of projects they are involved in, and their far reach across the globe. AF Civil Engineers can be sent on tours ranging from 6 months to 4 years in length, to 30 or more overseas locations, to manage operations, maintenance and new construction of all base facilities. They may also be sent on humanitarian missions to many more locations and countries. A newly commissioned AF CE officer who is sent to an overseas assignment receives very little military directed cultural training. 92% of CE

Officers abroad, even at the lowest ranks, will find themselves in a position where they supervise or work alongside LNs and lead cross-cultural teams on a weekly or daily basis (Boney, 2017). They will interact with potential allies, partners, neutrals or adversaries regularly. Examples of job duties include completing emergency response training with off-base fire departments, giving tours to host nation mayors, coordinating project planning documents with local municipalities, and managing one of many flights who have a partial or fully staffed LN component. Communicating and working side by side with any unfamiliar and deeply diverse culture requires a unique set of tools.

This begs the question, has the AF best prepared CE Officers for the challenges they will face in these overseas assignments? Is the AF aligning training goals and objectives to meet the needs of our global engineers today? In a previous Delphi study, cultural training gaps for AF CE Officers were identified (Boney, 2017). This follow-on study looks in depth at where those gaps specifically are and what the best method is for the Air Force to fill the needs identified. The Air Force Language, Regional Expertise and Culture program (LREC) was built in 2014 to develop, sustain, and utilize Airmen and international military partners to meet both the operational and building partnership needs of the force for today's dynamic, global environment (CJCS, 2013). This study can further the LREC initiative set out by the Air Force Chief of Staff and advise CE Commanders and the AF LREC Office of recommended training levels and methods.

The first study of this thesis was a survey given to AF CE Officers, aimed to answer the following questions:

1. What cultural training are AF CE Officers receiving prior to and upon arrival at an overseas assignment and is this adequate to meet their job duties?
2. What are common overseas construction challenges related to culture that AF CE Officers commonly face?
3. What are successful cultural training practices, should these practices be used by the military, and what does research tell us about successful learning methods?
4. How do industry and other DoD or military branches handle cultural training?

The second study of this thesis was a survey given to LNs, foreign military members and host nation partners, aimed at answering the following questions:

1. What are the common cultural issues when working with AF CE Officers on construction and engineering projects in their country?
2. Where is there a lack of cultural and construction knowledge in AF CE Officers?
3. How can AF CE Officers work more effectively with their counterparts on construction and engineering teams in foreign countries?
4. How can AF CE Officers better prepare and train for working on cross-cultural teams at overseas locations?
5. Are there trends in the measures based on location, tour type or position held?

A previous Air Force Institute of Technology graduate began researching this topic in 2017 after returning from a deployment to Kuwait where she felt ill prepared to face many of her job tasks, which involved coordinating construction documents with foreign leaders and local government agencies (Boney, 2017). Through a Delphi study, it was found that many had similar concerns and challenges. Boney's panel of experts,

comprised of 13 CE Officers and Civilians, concluded that yes, 3C is a contributing factor to successful AF CE projects overseas and 12 out of 13 members interviewed felt they did not receive enough cultural training to prepare them for their duties overseas. No standard of cultural training was found, and 25% of panelists received no training at all prior to their overseas assignment. Common culture related construction obstacles were noted, such as miscommunication, differing work hours and knowledge of local construction practices. These concerns had a negative effect on construction schedules and costs. Other organizations have also noted similar cultural training deficiencies such as the Combat Studies Institute, which recognized in the late 2000s that cultural training was oversimplified, focusing on a list of do's and do not's, and did not provide a context for cultural understanding (Wunderle, 2006).

Currently, there are few or no mandated cultural training requirements in the AF. The cultural training that exists is both job and location specific as identified by the commander of a squadron or base. Commanders can either build their own specific training for members once they arrive on station or they can request a new AF training requirement be built through the LREC review board that meets quarterly. The CJCSI 3126.01A outlines the Department of Defense's (DoD) definition of core cultural and reginal competencies and breaks them down by types of capability's and levels of capabilities. These are very general and are not very specific to military branch, air force specialty job code or location. A commander can use the CJCSI 3126.01A as tool to assess the level of proficiency his or her troops may need in a given location or job, but the manual provides very little guidance to commanders on best practices or resources available for training. The commander can submit real scenarios their troops have

experienced in their request for training to the LREC board to help build the necessary culture training requirements. Once the training is built and approved it can then be fulfilled by the AFCLC. Unfortunately, this process takes a lot of time and is rarely implemented.

It can be argued that 3C is gained through team building of any sort since most teams in the US are diverse in themselves. The majority of 3C training that CE Officers currently receive prior to entering the military is through the team building exercises during their military commissioning program. Currently, there is no specific 3C element to the Air Force Academy or Reserve Officer Training Core (ROTC) programs for overseas readiness and what is included into normal coursework is not location or job specific. If they are stationed in the US prior to going overseas, Officers will likely be a contributing member of several diverse groups and programs. This will allow them to gain some cross-cultural on-the-job training (OJT) through experience. What this does not give Officers is specific knowledge such as construction methods, value orientations or common business practices in a foreign country. This also generally doesn't allow for feedback specifically related to their 3C capabilities. The only training that currently exists to learn these job specific aspects of 3C is usually received after arrival at an overseas base through immersions or OJT. Cultural training in the form of Computer-based training (CBT) is required for AF members prior to deployments. This covers things such as religious practices, cultural taboos and important phrases for that specific area of operation (AOR). A few positions, usually filled by higher level leadership, will require advanced language and culture training, where the member will attend a school

for up to one year prior to deploying. Overall, there is currently no standardized or specific 3C training for AF CE Officers.

The Army recognizes the influence of U.S. Soldiers' behavior and action and its impact to the US's ability to accomplish missions in and amongst foreign cultures. Multiple studies have shown the importance of this concept including a 2011 study of Afghan and US military co-workers who issues several complaints towards one another. The study revealed highly negative views that contributed to frequent cultural miscues and friction between the two groups (French, 2013). Because the Army works so heavily on the ground with and around LNs in combat zones, they have fully recognized the importance of understanding culture and host nation perspectives. The Army has embedded culture into their entire training program. Their jobs are not unlike those of AF Civil Engineers in that they work side by side with the host nation on a regular basis. Prior to deployment, most AF CE Officers will complete a standardized Combat Skills Training (CST) course along with people from all other AFSC which is taught by the Army. It is generalized training that introduces students to real scenarios encountered with LNs at a deployed location (Wunderle, 2006). The scenarios are not engineering or construction specific, but the actors provide realistic depictions. This is a common and proven method of pre-integrating members with a foreign culture (Chung, 2014). The literature review will highlight what other branches of the military and what industry are doing to address similar 3C concerns. This study will further recommend other areas to bring 3C practices into AF CE Officer training.

Problem to be Investigated

In a study in India on a multi-national construction team, it was found that over 50% of knowledge system conflicts were a direct result of national-cultural boundaries (Di Marco et al., 2010). This research will investigate the negative impacts on construction project success and performance in overseas base locations due to a lack of 3C. The goal is to first find out what knowledge gaps exist for officers working overseas and then determine what training and tools are available to fill those knowledge gaps. The literature review will provide a thorough summary of current training methods and their effectiveness. The data collected will then help identify if any of the following factors contribute to the need for 3C in AF CE Officers:

- specific location or region
- certain jobs or positions held
- specific culture
- tour type -long/short/deployment

There are two widely used methods of cultural training. The first is a cultural orientation program geared around mental models and schemes of expected behavior for a given situation (Lewkowicz, et al., 2008). This is a method of understanding responses and basic cultural ideas which could reduce uncertainty in interactions between people from differing cultures using generalizations about a given culture, tribe or group of people. One example of this was created by American psychologist Lewis Goldberg, who developed the “Big Five” factor structure, which summarizes human personalities into five areas (Goldberg, 1981). Culture can be understood better by comparing similarities

and differences with personal culture using these five factors. A second approach focuses less on the actual culture norms and more on teaching attitudinal flexibility and handling unknown situations through continuous acclimation and experience. These are things that can be taught no matter the location. The AFCLC offers a variety of both types of training and resources, none of which are mandated for CE Officers at this time.

Justification for Research

The topic of alliances and partnerships between the US and our foreign military and non-military partners has been and continues to be under the spotlight of leadership interest. This study helps inform the DoD's strategies and Air Force priorities with empirical evidence to help transform these strategic visions to tactical forms. The Deputy Secretary of Defense said in his monthly update in November 2018 that "we continue to relentlessly implement the National Defense Strategy: enhancing the lethality of our Joint Force, strengthening alliances and attracting new partners." The Secretary of the Air Force released the following priorities (shown in

Figure **1**) of which three are arguably driven by 3C: Drive Innovation, Develop Exceptional Leaders and Strengthen Alliances.

Figure 1: Air Force Chief of Staff Priorities
(SECAF PA, 2017)

In the early 2000s when the US military's primary mission changed to a new type of warfare in the Middle East, it was recognized that leaders and military members would need a new approach to combat. The personal nature in which information and intelligence was gathered had changed (French, 2013). Military members had to earn the respect and work with LNs like they had never done before. The Army began incorporating 3C training into their entire training doctrine. The AF was sometimes viewed as further removed from the "on the ground" fight but have more recently made doctrine changes to also incorporate cultural training aspects.

Figure **2** gives a timeline from 2005 to present of the AF's path in initiating and implementing a LREC plan. It was not until 2014 that a formal LREC program was defined by Air Force Instruction (AFI) to be carried out by commanders and the AFCLC. There is still much work to be done before this doctrine is fully imbedded into the AF structure. Similar to what the Army experienced a few years after their LREC implementation, the AF's organizational, education and training approach reveals uneven application (French, 2013). There is not yet enough understanding of the principles of cultural capability or its employment at the tactical level.

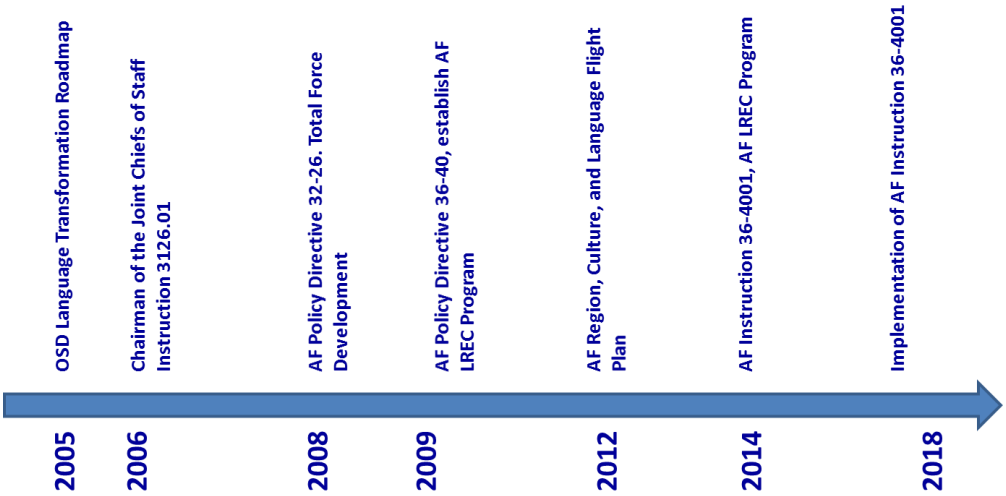

Figure 2: Timeline of US Air Force Cross-Cultural Doctrine

AF CE Officers at overseas bases lead and manage construction and engineering efforts for projects totaling billions of dollars annually. These facilities are warfighting platforms used to support both US Military missions of all branches as well as our allies in many parts of the world. Recent concerns in construction cost overruns have led to HQ AF leadership questioning the processes for building and sustaining our bases. Keeping construction efforts on schedule and under budget is of upmost importance to senior military leadership and government officials along with building strategic and lasting relationships with our host nations. It is also recognized that Airmen are the fundamental "weapons system" and the Air Force's greatest strength in its Total Force (CJCS, 2013). This research examines possible factors that relate to unsuccessful construction projects in overseas location, which also includes understanding the host nations perspective.

In a recent course offered at the Air Force Institute of Technology (AFIT), students focused on the topic of innovation and what it means for the DoD**.** As the world evolves, so does the warfighter and the missions of the AF. Soft innovation is that of the

processes and managerial principles that allow the deployment of new innovations (Badiru & Barlow, 2018). While this thesis is a study specifically of Civil Engineers in the AF, the ideas can potentially be applied to other career fields and departments within the DoD who complete projects alongside other countries and cultures. All innovation really needs to thrive is project management which is done through properly trained and equipped leaders. Innovation underlies all the other AF priorities, making it difficult to ignore when talking about the subject of training and preparing officers for the future AF. Innovation is also best pursed collectively or through collaboration which is why this thesis looks to the Army and industry partners who arguably lead the way in 3C training efforts (Badiru & Barlow, 2018).

Hypothesis

The following two figures show the proposed model this research will examine. Each of the independent variables are predicted to correlate with the dependent variable. The theory behind these variables is further explained in the literature review.

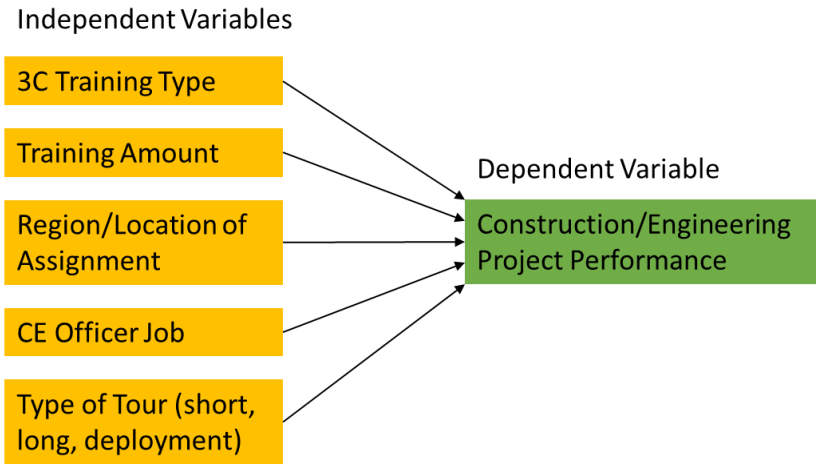

Figure 3: Independent and Dependent Variables for Survey I

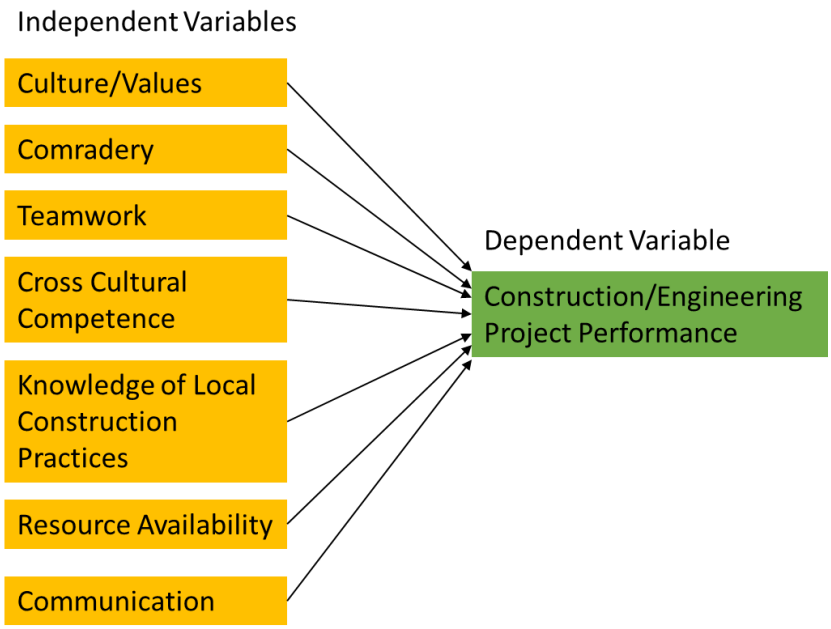

Figure 4: Independent and Dependent Variables for Survey II

Further hypotheses made in this research study for Survey II predict that there will be a difference in the means of the independent variables based on location, type of tour and job that host nation member held. Below are the nine additional hypotheses made for the Likert measures. The null hypothesis for each is that no difference in the means between the IVs and DVs as described.

H_o = there is no difference between the means

Location

H_{A1} = there will be a statistically significant difference in the measure of Communication determined by country with which the respondent was from.

H_{A2} = there will be a statistically significant difference in the measure of Cultures/Values determined by country with which the respondent was from.

H_{A3} = there will be a statistically significant difference in the measure of Knowledge of Local Construction Practices determined by country with which the respondent was from.

Tour Type (Short, Long, Deployment)

H_{A4} = there will be a statistically significant difference in the measure of Communication determined by tour type and duration of the base from which the respondent was.

H_{A5} = there will be a statistically significant difference in the measure of Comradery determined by tour type and duration of the base from which the respondent was.

H_{A6} = there will be a statistically significant difference in the measure of Knowledge of Local Construction Practices determined by tour type and duration of the base from which the respondent was.

Position or Job Held

H_{A7} = there will be a statistically significant difference in the measure of Communication determined by job held at overseas location by respondent.

H_{A8} =there will be a statistically significant difference in the measure of Comradery determined by job held at overseas location by respondent.

H_{A9} = there will be a statistically significant difference in the measure of Teamwork determined by job held at overseas location by respondent.

There has been an abundance of research in the topic of cross-cultural leadership and diversity since the late 90s (Dickerson, et al., 2003). There have been very mixed results from studies relating diversity with performance (Jackson, et al., 2003). Dickson

argues that there are three major issues that consistently arise when studying such a broad and multi-dimensional topic such as 3C. First is the problem with translation and how a survey across languages is developed and interpreted. Second, various levels of analysis problems can arise because the definitions of leadership, culture and cultural competence on their own are not concrete variables and vary by organization and interpreter. Lastly, the various theories behind, and the application of, the many different forms of cultural dimensions are still debated today. This makes preliminary studies in this realm of research difficult to control and measure but the survey author focused research on best defining of variables in order to overcome these concerns.

Scope

The scope of the first survey for this research was mid ranking Air Force Civil Engineer officers who worked at one or more of the 21 overseas AF base locations that span four Major Commands (MAJCOMS). The scope of the second survey was LN personnel that worked at one of the 21 overseas AF bases on engineering or construction related-tasks. Some smaller bases and job locations were not considered because the main duties of these persons were not construction or engineering-related. Officer ranks were specifically studied because enlisted ranks and US civilians have different training routes and career paths, which could affect the reliability of the results. While the scope of the data was only AF CE Officers and host nation partners at the mentioned 21 bases, the results could be applicable for other ranks of AF Civil Engineers, such as civilians and enlisted ranks. The data set could also be useful in understanding 3C implications within other mission support functions such as Security Forces and Logistic Readiness or for

broader applications such as the AF as a whole, other military branches or companies that work overseas.

Other Support

The main sponsor and interested party in this topic is the Air Force Culture and Language Center (AFCLC), founded in 2006, to improve Airmen's 3C and provide culture and language training for the entire AF. The AFCLC maintains two mandatory pre-deployment expeditionary courses, which are delivered via CBT, and two college courses, which enlisted ranked members can take as associate degree electives. The US Army Corp of Engineers (USACE) works directly with CE Officers on many large-scale construction projects overseas. USACE has their own methods of training, which are like those of the Army and were very supportive of these research efforts. The US Army Training and Doctrine Command (TRADOC) Culture Center (TCC) also provided a great deal of information and input.

II. LITERATURE REVIEW

Introduction

The importance of culture in the military is not a new topic. A pentagon directive in November 2005 ordered military to develop skills in foreign language capabilities and regional expertise newly termed LREC capabilities. After several iterations of the LREC military policy went into effect, the Chairman of the Joint Chief of Staff issued the J-1 instruction in 2012 recognizing "that LREC skills are enduring warfighter competencies critical to global mission readiness and integral to joint operations" (Chairman of the Joint Chief of Staff, 2013). AF Directive 36-40 established the AF LREC program, which then launched the Air Force LREC Plan in 2015. Leadership driving these policy adjustments understood that LREC-skilled Airmen from many specialty codes support critical mission needs in special operations, irregular warfare, humanitarian relief and in security activities that enhance international partnership and global capabilities (AFCLC, 2014). Since 2015, various AF leaders have begun incorporating culture training into their mission functions but the process for developing new training objectives for the entire force has been limited. AFCLC offers an array of volunteer training opportunities and work daily to provide commanders with resources upon request. Mandated training thus far has been incorporated into pre-deployment courses or computer-based trainings (CBT). There is a lack of knowledge as to what AF CE Officers specifically need. This study will assist the AFCLC, CE Squadron Commanders and the LREC Training managers better discern CE career field requirements that align with the policies set out by the Secretary of Defense.

From Lesson 2 of the Cross Cultural Communications course offered at AFCLC, schemas are defined as boxes that humans place ideas and knowledge into based on experiences and education (AFCLC, 2017). Since no life is the same, each person's schemas are different. People use these pre-formed ideas of the world as a lens though which to view the world. When humans encounter a new situation or location, they then use these schemas to try to understand what is happening around them and to form decisions on how to act or react. When a human is surrounded by many unfamiliarities, they begin filling blanks in their schemas with best guesses or assumptions. People build their environments in ways that reflect their values and assumptions about the world. Sometimes filling these blanks with too many assumptions leads to stereotyping and attribution, causing conflict and biases or a self-verses-others mentality. This can lead to an array of issues and lower productivity in any workplace. 3C is about making less assumptions where possible, and forming better, more informed guesses, which will lead to stronger understanding and effective action in a culturally complex environment. 3C is about stepping away from ethnocentrisms or thinking "my way is the only way", and seeing another perspective. This includes treating each and every human with respect and courtesy while also getting the mission done.

According to the USAF, culture is defined as "the creation, maintenance, and transformation across generations of shared patters of meaning, affiliation, action and organization by groups" (AFCLC, 2014). Culture is very powerful and gives people a sense of identity and self-worth. Cultural and organizational behavior are fundamental to examining what goes on in organizations, running businesses and improving programs (Schein, 2012). For example, 69% of outsourced projects in the global software industry

fail due to cultural incompatibilities and poor relationship management (Shah, et al., 2012). This literature review will focus on an array of topics surrounding the concern that AF CE Officers are not receiving adequate cultural training to perform their jobs at overseas locations, which in turn directly affects the AF's ability to do its mission. The first part of this literature review will look at common culture models, cultural training methods and organizational behavior. The second part will dive into the theory and past studies that led to the hypothesis formed within, including a discussion on each of the independent variables tested. The third section will look at current practices of DoD organizations, universities and industry leaders. An array of best practices for preparing engineers to work on and lead highly cross-cultured teams will be covered.

Methods of Training and Cultural Models

From an AFCLC course, culture is a powerful determinate of behavior (AFCLC, 2017). A person may be taking on a lot of risk when assuming everyone from another culture is a certain way based on experiences with a select number of people from that culture. For example, in contract negotiation, a military member handling a heating project may only have experience with hiring one other HVAC contractor in the area who perhaps performed poorly in the past. They may then assume that every contractor from the location is similar, instead of taking time to reflect and try to gain a better understanding of someone else's schemas, background, and values. This is using assumptions rather than true observations and making impactful decisions that could affect the AF mission.

There are many approaches and studies to suggest methods of training 3C. The two most common types that will be discussed below are specific and general, as outlined by the Institute of Organizational Studies and Behavior (Brandl & Neyer, 2009). First and most widely used is country specific or a cultural orientation program geared around a specific location. This is a method of placing everyone from a country into a single bucket and learning their basic norms, behaviors, expected behaviors and customs (AFCLC, 2017). General 3C uses mental models and schemes of expected behavior for a given situation to better understanding responses and basic cultural ideas. These models aim to reduce uncertainty in interactions between people in-experienced with the others culture (Hope & Wildman, 2012). General is an overall model used to better understand the tendencies of a culture as compared to your own and understanding large concepts that can help you relate to people of all cultural backgrounds (AFCLC, 2017). This second approach focuses less on the actual culture norms and more on teaching attitudinal flexibility and handling unknown situations through continuous acclimation and experience. There are many studies that look at the effectiveness of each and argue preferences for one or the other. The method of which the training is given can play a crucial role in its effectiveness. A study comparing teaching methods found that students who participated in an engineering ethics cross-cultural course learned 39.4 percent more using a simulator verses the traditional dogmatic briefing or classroom teaching approach (Chung, 2014).

Cultural diversity is categorized into “surface-level” and “deep-level” (Harrison, et. al, 1998; G. H. Hofstede, 1984; Stahl, et al. 2009). Surface-level cultural diversity encompasses variations in demographic markers, such as ethnicity or nationality and are

usually described using one of the eight simplified taxonomies (Jackson & May, 1995). These are things that can be learned specific to a location. Deep-level cultural diversity involves differences in cultural attitudes, norms, and values and are studied by examining the domains shared by all cultures (Jackson et al., 2003). Understanding how to use these domains and how to interact with a new culture in general and create a healthy working relationship can be taught at any time. Although much of research focuses on surface-level forms of cultural diversity (Oerlemans & Peeters, 2010), a growing body of reports show a significant impact from deep-level forms of cultural diversity on work performance (Harrison et al., 1998). Therefore, both forms were investigated for this research and it is believed that a mix of both culture specific and general cultural knowledge will assist AF CE Officers gain 3C.

Culture Specific Knowledge

Members might look up one of the many culture specific models or taxonomies that help compare personal values and behavioral tendencies to that of the host nation before heading to their overseas location. These models are used in CBTs throughout the military. Having a snapshot of a foreign country can be useful when preparing to work with people of another culture. Below are six common models, many of which were used to formulate the theory behind the survey questions asked within this study. Regional competencies which focus on certain areas of the world and depict common trends in values and culture in those areas are also commonly used (Watson, 2009). It is important to emphasize that these are generalized and do not apply in all circumstances. For

example, saying everyone in the United States thinks driving 60 mph on the highway is the correct speed would be an oversimplification.

The most commonly referred to taxonomy is Hofstede's Dimensions of Cultural Values (Colquitt, at el.,2013). It has been used to compare the cultures of different societies using five categories. Project Global Leadership and Organizational Behavior Effectiveness that is more recent and consists of nine categories. Figure 5 below shows the differences between the two dimensions.

Hofstede's Dimensions	**GLOBE Dimensions**
Power Distance	Power Distance
Uncertainty Avoidance	Uncertainty Avoidance
Individualism vs Collectivism	Institutional Collectivism
Masculine vs Feminism	Performance Orientation
Long Term vs Short Term Orientation	Future Orientation
Restraint vs Indulgence	
	In-Group Collectivism
	Humane Orientation
	Assertiveness
	Gender Egalitarianism

Figure 5: Hofstede's vs GLOBE Cultural Dimensions
Sources: Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004

Other commonly used cultural dimensions are Trompenaars's and Halls (Magnusson & Wilson, 2008). Trompenaars uses seven attributes broken into three

categories: explicit culture or observable, norms and values, and assumption about existence. Hall uses eight factors to determine how high or low context a culture is, which can help one understand and communicate with people from that area (Mccrae & Terracciano, 2005). He looks at things such as power and status, feeling, time and communication patterns. Studies show that all these models can be used to better understand a new culture. There is competing evidence as to which one is more valid, but each will help a member in the AF better understand what 3C obstacles they could face during their job duties overseas. Goldberg's "Big Five" Personality Factor Structure is another source that can help a leader better understand their people once they are assigned to a work team. The more personality types in an organization can actually create more effective teams (Mccrae & Terracciano, 2005). Lastly, Peterson Cultural Style Indicator can be used to compare two people from different cultures based on similar dimensions as Hofstede's. It is a simple depiction of a scale of values.

While these models are a simple reference to quickly understand a culture better, they may form stereotypes or suggest values that are not true of everyone from a place. Assuming everyone in a country has a single common set of values can be an oversimplification, limiting the meaning of culture to a set of boxes (Shah et al., 2012). Large countries, such as India, the United States or Iraq, vary tremendously from one boarder to the next. They consist of a vast number of languages, tribes, economic incomes and religions. Shah believes that describing a culture in terms of national characteristics limits a member's ability to observe a culture and is a static interpretation of that nation's beliefs and values. To overcome this, members can be taught general 3C skills as well.

Culture General Knowledge

Differences in value orientation can complicate communication and change interpersonal behaviors. Team leaders are expected to help mitigate the issues that arise on cross-cultural teams, facilitating collaboration and improving teamwork. General knowledge is that which can be applied in any situation. The AFCLC Introduction to Culture Course focuses on 12 cultural domains, which are categories of human interaction, belief and meaning that every culture shares (AFCLC, 2017). These are shown in Figure 6 below. By observing, studying or interacting with a culture, a member can begin to understand how the others perceive each of the domains. People can begin filing observations in terms of the domains and overcome natural tendencies to stereotype by leaving each culture as an open book without modeled assumptions.

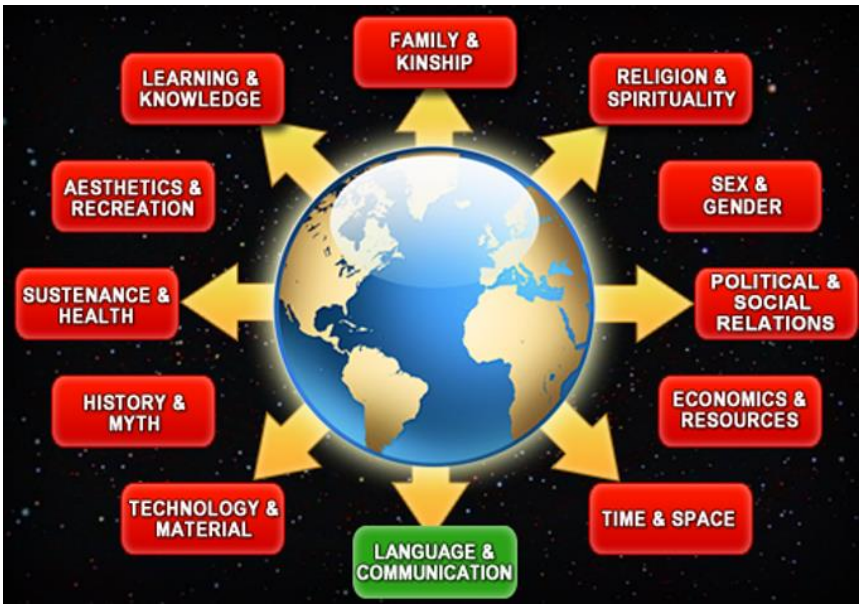

Figure 6: Air Force Cultural Domains
Source: AFCLC, 2017

A recent study aimed to better understand what makes multinational teams successful (Cheng et al., 2012). At project start, when the multi-national teammates did

not know each other and were unfamiliar with the other culture, members exhibited high levels of uncertainty and anxiety. It was found that teams with a lower average level of uncertainty avoidance, or the ability to cope with the uncertainties, risk and chaos associated with working in an unfamiliar situation, were more successful in their project tasks (Wennekers, et al., 2003). Things like cultural sensitivity training and preparation aimed at reducing individuals' uncertainty avoidance could be offered to members to help ensure high performance during the early stages of their new team formation. It was also suggested that teams with consistent flux, such as military organizations, will undergo re-occurring storming and norming phases. Uncertainty avoidance traits will be especially critical for these types of teams (Williams & O'Reilly, 1998). Research also shows that innovation and low uncertainty avoidance have a positive association (Shane, 1995). Giving officers tools to lower uncertainty avoidance is a good practice no matter where officers are going because they are almost always integrated into teams. The other benefit of this type of general training is it can be offered at any time in the members career since it is not location specific.

In another study, Rehg suggest 4 major components to learning a culture which include cognitive, motivational, behavioral and self-efficacy or the judgment of one's own abilities to accomplish a task (Rehg, et al., 2012). Self-efficacy and goal setting are also positively related which are important in project and task management (Colquitt, et al., 2013). The findings showed that cultural training had a highly significant effect on cognitive learning or the ability to quickly learn new things in a new environment. It is important to not only learn country specific information but to teach military members an overall method to adapting to new locations and situations.

Dependent Variable

When individuals from different cultural backgrounds come together onto one team, the confluence of different cultural perspectives offers great potential for high team performance but sometimes this is not ever realized (Cheng et al., 2012). Team diversity affects team performance and cultural diversity presents obstacles that need to be carefully managed (Stahl et al., 2009). Performance can be a difficult measurement to take, especially for large construction and engineering projects, which are so diverse in nature and are comprised of many moving pieces. Project performance metrics often include things such as engineering cost, construction cost, engineering time and overall project delivery (Lewkowicz et al., 2008). Dr. Terry Williams argues that there are interrelationships between all these metrics and it is nearly impossible to measure an entire projects successfulness without considering all the interactions between project elements (Williams, 2016). Industry has moved from the simplistic definition of project success as meeting cost, schedule, and performance targets, to a more multi-dimensional definition, involving both objective and subjective criteria. Another study found that project success lies within its leadership and their ability to handle conflicts (French, 2013). French speculates that the center of all projects ends up being people such as the customers, contractors, engineers, government officials and suppliers, which are driven by culture and values. Success requires openness between the parties, ready acceptance of new ideas, trust and perceived mutual benefit. While multicultural teams can sometimes be complicated, studies have shown that diverse teams are used because they out-perform mono-culture teams, especially when performance requires multiple skills and judgement (Earley & Mosakowski, 2000). Each person brings different creative ideas to a work

place because of their schemas and experiences, which diversifies solutions to everyday problems.

The dependent variable in this study is project success, which is measured using four survey questions related to project performance and proper allocation of resources. Overseas bases serve not only as a platform for a US military warfighting mission but also provide soldiers, civilians and their families with a quality of life commensurate with the quality of their service (Peters, et al., 2018). The AF is given a set amount of money from congress each year to complete facility sustainment and new construction. When construction is completed at or under budget, more projects can be done, which will likely increase the quality of life (QoL) for those living on that base and support the mission. These aspects of project success were taken into account when writing the survey questions.

Independent Variables

A previous thesis Delphi study found that training, communication and construction management strategies all had a positive correlation with military engineering efforts overseas (Boney, 2017). Boney also found that the majority of her thirteen interviewees had negative feedback as to the adequacy, applicability, and usefulness of the cultural training they received prior to or while they were at their overseas base. This built the theory and motivation that the first part of this study was based on. It used a multiple-choice survey, given to CE Officers, to better understand specifically how training type and duration are related the ability to perform construction

or engineering projects successfully in foreign locations. It also looked at potential contextual or situational factors, such as CE Officer job, location and tour type.

The second study used a multiple-choice survey, given to host nation counterparts who work with CE Officers regularly, to better understand foreign counterpart perspectives. The study measured the effectiveness of six independent variables: values, teamwork, comradery, cross-cultural competence, communication, and knowledge of local work customs. Below are the ideas that led to the topics of study and hypothesis. While there have been many organizational behavior studies related to 3C, no comprehensive study of host nation personnel at military bases has been completed. It should be understood that culture is a multidimensional, multifaceted phenomenon, not easily reduced to a few dimensions, but these studies aim to better understand what is most concerning to military host nation and foreign partners in order to better prepare AF CE Officers for their overseas tours (Schein, 2012). Table 1: **Independent and Dependent Variables for** below outlines all the independent and dependent variables of the study to be described, along with the situational factors that will be inspected.

Table 1: Independent and Dependent Variables for Each Study

Dependent Variable	Independent Variables	Situational Factors
	Study 1	
	Cultural Training Type	Geographic Location

Construction and Engineering Performance at Overseas Bases (CE Officer perspective)	Cultural Training Amount	Type of Tour
		Job Held
Study 2		
Construction and Engineering Performance at Overseas Bases (host nation personnel prospective)	Culture and Values	Geographic Location
	Teamwork	Job Held
	Comradery	Tour Type
	Cross Cultural Competence	
	Knowledge of local work practices	
	Resource Allocation	
	Communication	

Culture and Values

Cultural differences arise in geographical differences, ethnic differences and national culture (Lewkowicz et al., 2008). Culture is something so engrained in humans and starts forming from the moment a person is born. The way someone sees the world is through what surrounds them such as family, education systems, politics, economies, sustenance and reginal history (AFCLC, 2017). Innately, as one grows older, these ideas formed about the world lead to values that guide decisions and actions. Unfortunately, when a person's values do not align with others, it can cause misunderstandings or conflict. A meta-analysis of cultural impact found that the influence of cultural values endorsed by team members to be strongest for emotional outcomes, attitudes, behaviors, and performance (Taras et al., 2010). It has also been found that understanding items that people value will assist leaders in administering appropriate rewards and recognition, improving job performance (Lewkowicz et al., 2008).

Teamwork

Engineering and construction projects are usually conducted using teams because this type of work generally involves many crafts and specialties. The idea of the 'single team' is an important part of an office culture (Williams, 2016). Once members overcome initial team building challenges occasioned by cultural differences and uncertainty avoidance, the teams relationship orientation traits begin to play a role (Cheng et al., 2012). It can take time for the team to realize the benefits of the multicultural resources they provide to one another. Studies show that teamwork processes have a moderately positive effect on the team's performance especially in complex knowledge work such as engineering and construction (LePine et al., 2008). There are several types of teams to include work teams, management teams, action teams, project teams and parallel teams. The amount of diversity in the team will influence its cohesion. Leadership plays a large role in creating and binding of successful teams especially those with deep level diversity.

One study took an in-depth look at 48 teams from 11 companies (Di Marco et al., 2010). Each team was made of people from at least three different countries. The study found that a diverse climate in itself did not determine a team's effectiveness. The most effective teams emerged when oscillation occurred during knowledge exchange between members and leadership. This means that communication altered between clear, direct and assertive and, suggestive, exploratory and active listening. By combining the two types of knowledge exchange and communication styles, and applying them when appropriate, the team's effectiveness was at its highest. Oppositely, using an assertive knowledge exchange alone led to distrust among minority groups and caused insufficient

flow of information. Using cooperative processes alone would sometimes leave important issues unfinished or unclear. People use social relations to perpetuate culture, enforce social rules, maintain resources and solve conflicts (AFCLC, 2017). Understanding individual team member dynamics and the local social and political norms will reduce assumptions about how local systems work and lead to better teamwork. Having trained or experienced leadership in the topic of teamwork and culture is predicted to aid in project success.

Comradery

Where there is divergence in ideas on a construction or engineering team, at some point the team must converge to a single conclusion (Hajro et al., 2015). This is the fine line that teams teeter on which challenges team leaders. They must align the group but without proper training or experience with each diverse element of the team, this proves to be difficult for leaders. Teams with high relationship orientation have a high level of trust, commitment and reciprocity (Cheng et al., 2012). Comradery, or a team's ability to connect on a social level, often leads to higher performance teams with greater relationship orientation (Brannick et al., 1995). Ample opportunities should be provided for personal interaction and socio-emotional bonding to help aid in team transition from storming to norming (Cheng et al., 2012). Comradery can be incorporated into the workplace in many ways but one of these is through sports or recreational activities, which serve as a way for a culture to keep traditions alive and promotes bonding (AFCLC, 2017). Aesthetics or how people dress inside and outside the work place, and recreation both convey and transmit culture. Understanding how locals express

themselves creatively and spend their leisure time can improve the ability to relate and communicate with those people while also opening a window into their history, traditions, values and beliefs.

One study looked at two engineering teams tasked with a project in India (Di Marco et al., 2010). The first team was a combination of Americans and Indians. The second was the same combination but included an Indian who had studied and worked in America. It was found that having the Indian expatriate on the second team was highly beneficial because it played a cultural boundary spanning role that helped team comradery and reduced conflict. Weak interpersonal relationships impeded knowledge exchange which is needed on engineering projects. The study suggests that the boundary spanners do not necessarily need to be managers, they just should be a part of the team and willing to assist in the collaboration efforts of all cultures they have experience with. The study further suggested that the boundary spanners actions have a ripple effect causing other team members to emerge into the role themselves, creating a more cohesive environment. Comradery is a part of everyone's culture in one form or another and is predicted to play a role in project success. Introducing social activities and boundary spanners to a team will likely improve the level of comradery between the members.

Cross-Cultural Competence

Most American soldiers have the best of intentions when deploying into a foreign environment. However, if unprepared for the challenges that accompany cultural immersion under adverse and stressful conditions, they can inadvertently result in a disastrous outcome (French, 2013). French tells us that most commonly, friction and

misunderstanding are borne of ignorance, ethnocentrism and miscommunication, These things undermine the trust and credibility among multi-cultural stakeholders. 3C is the ability to quickly and accurately comprehend and act in a culturally complex environment to achieve a desired outcome without necessarily having prior exposure to a group, region or language (AFCLC, 2017). This is the fundamental measure to working effectively in a new cultural environment.

According to Watson, 3C is more durable and easily attainable knowledge compared to language proficiency, which is time-extensive to both attain and sustain and is not as transferable to other regions (Watson, 2009). By understanding CE Officers 3C as viewed from the host nations perspective, this research can help develop better training objectives for officers working with foreigners on projects. AFI 36-4001 holds the AF LREC office responsible for developing force education, training, sustainment and management with objectives and measurable outcomes in order to develop sufficient 3C Airmen at all levels (AFI 36-4001, 2014). It is shown that these 3C trained Airmen are more capable and perform job duties, both stateside and overseas, at a higher rate of return, so the military has placed emphasis on this in recent years.

A person with high 3C has an aptitude to determine where new behaviors are needed and how to execute them effectively (Earley & Peterson, 2004). This skill could be crucial to the success of the cross-cultural relationships between an officer and a new contractor or LN, much as it is in other business contexts. Ultimately, inadequate cultural preparation and understanding can be fatal to military personnel and their success overseas (O'Connor, 2010).

Knowledge of Local Construction and Work Practices

More specific to engineering and construction, it has been found that knowledge system conflicts reduce collaboration effectiveness (Soibelman et al., 2011). This means that when members of a team have different levels of knowledge on a subject, it lowers the productivity of the group as a whole (Di Marco et al., 2010). Understanding the basics of local codes, transportation chains, common work customs and courtesies, and local labor constraints will assist in project success. For example, recognizing that Japanese contractors prefer to work six days a week for eight hours a day will help in building both a workable schedule and a relationship with the contractor. Figuring out the supply chain and local material availabilities, geographic climates, and methods of contracting, will save time, alleviate confusion and increase morale of the subcontractors. Geography is another example of how cultural domains differ between people. Where a person lives influences lifestyle, behaviors, beliefs, values, norms, perceptions and priorities (AFCLC, 2017). A contractor building a family housing unit on a base may have never visited or seen the quality and layout of a modern American home. Leaders need to look at project tasks through the perspective of those they are leading.

Currently, schools and military programs teach technical principles of engineering but rarely introduce other countries' engineering and management practices, methods, and standards (Soibelman et al., 2011). Collaboration is then weakened when construction professionals lack awareness and familiarity with the technical norms of their foreign counterparts and potentially show disrespect for those in less-developed countries (Soibelman et al., 2011). Multicultural teams benefit from leaders who are knowledgeable and skillful in handling cultural differences and can come up with team

norms and structure that facilitate communication and coordination on projects (Dickerson et al., 2003). Having people on project teams that have experience or have studied these construction and geographical specific items can help military members so long as they trust and seek out that knowledge within their teams. Preferably, Officers would know as much of these norms prior to arrival so they can focus on other team-building aspects such as comradery.

Communication

Humans use more than 7000 languages to communicate. They rely on non-verbals much more heavily in a cross-cultural environment due to the diversity in language (Lewis, 2009). Results of a study by Mehrabian showed that the relative influence of verbal and non-verbal communication on attitudes are 7% verbal, 38% vocal and 55% facial (Mehrabian, 1980). This makes communication even more important to study because culture shapes our non-verbal's, which shapes our ability to communicate (AFCLC, 2017). Engineering and construction teams often rely heavily on one another and a key mechanism of team coordination is communication among team members (Rudenstam & Holmberg, 2014). Aspects of communication that every human culture share are: eye contact, allowing both members to participate in the conversation, non-verbal's which account for 55% of language, proxemics or personal space, and voice inflection (AFCLC, 2017). These aspects can be perceived much different from each culture and are important to understand. For example, some countries have rules regarding how people of different ages and genders can talk to one another. In some countries it is polite to make eye contact and others it is overpowering and intimidating.

Within-team coordination can be achieved if objectives, knowledge and behaviors of team members are well-aligned, which takes a great amount of clear communication, specifically from the leadership (Rico et al., 2008).

A study at University of Timisoara in Romania found that the context of communication is important (Lewkowicz et al., 2008). Misunderstandings are caused by poor or misinterpreted communication and can be both positive and negative, either leading to discussion and healthy debate or to conflict and mistrust. For example, the English language is full of nuances or words with multiple meanings. Advice from Lewkowicz for English speakers: slow down, avoid negative questions, take turns and be patient, write things down, be supportive to increase confidence, check the meanings, summarize and watch the humor used. Another research study suggested that the most effective teams are those with a safe communication climate, promoting differences in perspectives and thinking (Hajro et al., 2015). Also, by not assuming the other person has poor intentions and by considering that there may be cultural differences, people can increase this positive climate and lead to a more productive work environment.

It can be argued that one cannot fully communicate with another culture without learning the language, which expresses, embodies and symbolizes cultural reality (Watson, 2009). It is the primary medium by which culture is handed down from generations. Watson shares that language not only gives structure to individual thought but also to collective thought processes of an entire community or society. Therefore, language and culture can be argued to go hand in hand in almost all cases. Watson concludes that due to the interdependency of the two, that without a strong focus in both

language and 3C, the effectiveness of our soldiers in intercultural interactions will be limited. Due to the short time of any officer or soldiers term in a given location, he or she is unlikely to learn the language well enough to communicate construction and engineering terms without formal language training prior to arrival. This study will look to determine members who would benefit from receiving in-depth language training to better perform their CE Officer job duties. It will also try to understand the host nation's perspective on communication and language differences.

Resources

This independent variable measured how effective and important human resource management and allocation of resources is for project success. Loosemore has an entire book dedicated to human and resource management in the construction industry (Loosemore et al., 2003). He shares that although construction is very labor-intensive, people management issues are given inadequate attention. Middle managers, such a mid-ranking officers, link strategic management to the operational production function at project level. Their ability to manage organizational resources to include people is fundamental in project success. Swenson tells us that in order for employee empowerment to occur, management should provide clear goals, parameters and resources to the teams (Swenson, 1997). Human resources represent large costs on most construction and engineering projects, and the industry employs an extremely diverse range of people from a wide range of occupational cultures and backgrounds, including people in unskilled, craft, managerial, professional and administrative positions (Loosemore et al., 2003).

One study in the UK found that few signs of fundamental or far-reaching innovation in human resource management practice in the construction industry have occurred recently despite the changing shape and globalization of construction companies (Druker et. al,2010). The Congressional Research Service outlines the typical process for a newly constructed building in the military (Williams, 2018). There is an abundance of processes to go through in order for the financial resources to be directed for large projects and these new buildings can take well over five years to come to fruition. This can be detrimental to the mission for critical infrastructure projects. Resource and people management are both critical parts to successful construction and become only that much more challenging when working in foreign countries where there are fluctuations in things like currency and standard work practices. Combining this with a fiscally constrained and low risk-taking US DoD makes for a very challenging CE leadership environment. Understanding some of these hurdles should assist CE Officers in performing construction overseas.

Current Practices

Cross-cultural collaboration is nothing new but is of increasing importance as the world gets smaller because governments, especially that of the United States, and industries are spanning with projects all over the globe. Below are current practices from the military, industry and universities.

Universities

Universities lay the groundwork for engineers and their preparedness for entering the field that they will work in. Every CE Officer will complete a technical science or

engineering undergraduate degree at a university or the Air Force Academy. Initial impetus for the inclusion of international curriculum began in the humanities and social sciences but hard sciences have since realized that strong international skills are also needed for the global engineering workplace of today (Doerry et al., 2003). Schools are seeing the impact of global partnerships, study abroad programs and are beginning to allow incorporate more programs into their schools to allow engineering students to gain experience in cross cultural collaboration during their university tenure.

One study focused on a specific school who found importance of 3C. They included a mandatory course in their CE program that focused on international collaboration in construction management (Soibelman et al., 2011). A study of the multinational teams who were in the class revealed many cultural lessons. Notably, they saw high differences amongst team members of differing countries in the areas of communication and technological skills. This led to confusion and less productivity for the teams in the beginning. Working through this course gave students experiences and 3C skills they could apply outside of school.

Schools are recently arguing the importance of 3C and are offering more programs and opportunities to students. Oregon State offers a “Passport” International Degree Program to supplement any degree program. University of Rhode Island offers a bachelor’s in international engineering. West Point Military Academy regards culture and language as equally important and strives for its students to study both. They have recently piloted a Semester Abroad Program to further prepare its graduates for duty (Watson, 2010). Unfortunately, while more universities are offering these programs, only

10% of engineering students are enrolling in them. There is a low participation in international programs overall. Northern Arizona University has an array of engineering study abroad opportunities but less than 2% of graduating engineers receive significant international training. Reasons students are not enrolling include: already have challenging curriculum, learning a new language is difficult, semester timing is a challenge, or they do not yet understand how likely they are to collaborate on international teams post-graduation. To combat this, one professor started the Global Engineering College (GEC), which is an innovative concept of a virtual engineering college combining curricula and education opportunities from several engineering institutions. The GEC is a college that partners with multiple universities, foreign and domestic, to offer internal electives and courses that would not otherwise be available to students. They focus on the technological aspect that the internet allows collaboration internationally giving a multi-cultural teambuilding experience.

Industry

The increased application of electronic communications has led to a number of construction and engineering projects being designed and developed in dispersed locations with multinational correspondence (Ochieng & Price, 2010). In addition, Ochieng shares that there has been an inclination by industry to undertake these types of projects in partnership or joint ventures, which has resulted in more multicultural project teams than ever seen before. He says, “being familiar with cultural issues empowers project leaders with the requisite knowledge for improving the efficiency of managing multicultural project teams”.

Industry experiences many of the same challenges as the DoD in construction and engineering at overseas locations and there is a great amount of research that has been conducted in this area of cross-cultural teams. Many of the studies throughout this literature review have stemmed from industry's best practices. The military should always be leaning forward, working with civilian counterparts to gain more understanding and learning from joint experiences. This will both help the military to work with contractors from the private sector, as well as execute projects themselves in similar overseas environments. In a study conducted with a 20-member UK and Kenyan construction and engineering team who built an industrial plant, it was found that the way in which project leaders communicated on projects has more influence than the actual words used (Mehrabian, 1981). It was also found that having high quality standards, clear communication, trust amongst team members and creating collectivism were thought to be successful tactics to creating a successful international construction project. There are endless other lessons to be learned from engineers outside the DoD. The Defense Innovation Unit (DIU), started in the Silicon Valley, is one example of how the military is reaching out to industry partners to solve nation defense problems (DIU, 2016).

Military

After a decade of counterinsurgency, the U.S. military continues to face the challenge of preparing for an uncertain 21st century threat across the entire range of its overseas operations (French, 2013). The military continually retools for new wars and missions, in a fiscally austere environment, and leaders determine what lessons have value in shaping the future of the force. One thing is certain, that land power will

continue to be employed in the human domain, which is comprised of a vast, diverse array of cultures (French, 2013). French claims that one major lesson taken from Iraq and Afghanistan was the importance of the methods the military uses to educate and train its soldiers for operations within various cultures. This substantially contributes to the pursuit of national security interests. There are three main US military branches 3C programs which were captured below: Army, Marines and Air Force. Since the military and DoD has such a wide range of job duties, locations and team organization, they build a great foundation for the topic of cross-cultural communication and teamwork. Each branch has a culture and language mission and a support center. Each has a different method and focus of training.

The US Army has built a Training and Doctrine Command Culture Center (TCC) to focus on preparing soldiers, prior to deployment, for working with LNs in a specific social system. They teach regional cross-cultural competence. This set of skills includes awareness of one's self in the context of other cultures along with region specific competencies. The TCC uses the VBBN Culture Model (values, beliefs, behaviors, norms) to define the dynamic social system of culture. The TCC focuses on 3C because its more durable and easily attainable as compared to language proficiency and reginal competencies that are not easily adaptable for soldiers who might travel between many locations and tribes on a single deployment (Watson, 2010).

The US Marines Center for Advanced Operational Culture Learning (CAOCL) limits its definition of culture to just those elements that are relevant to the operational mission of the organization (Watson, 2009). The five domains they focus on are: physical

environment, economy, social structure, political structure and belief systems. The USMC has a unique mission and the location of that can change often while on deployments. For this reason, they adopted the definition of culture to meet their operational needs. They did this by creating a training program that teaches behaviors that soldiers can switch into, or activate, given the group they are interacting with or the purpose of their interaction. Marines often will not have the time to develop long lasting relationships with LNs and must learn to act in a fast pace environment while still adapting culturally. The Tactical Language and Culture Training System (TLCTS) is a US military funded virtual reality computer training program used by the Marines (Johnson & Valente, 2009). To date, the program has mainly been used to train troops for two specific locations with the third in development: Tactical Iraq, Tactical Pashto and Tactical French. Through a variety of lessons and games, the system gives feedback on pronunciation, grammar, cultural pragmatics and word choice. In general, this approach has received positive feedback from Marines who have received the training and is currently being evaluated by other branches.

Lastly, the Air Force Culture and Language Center (AFCLC) operationalizes culture through 12 contexts such as family and kinship, religion and spirituality, time and space, gender, politics, history, language and economics (AFCLC, 2014). They break training into three levels: the surface being outward behaviors, the middle being belief and social structures and the deep understanding including values and language. They explain the difference between visible cultural behaviors, such as actions and symbols, and underlying beliefs and values using an iceberg analogy. Their studies include both a 3C or general cultural competency model and regional knowledge. The Air Force's

language aptitude and learning center is geographically separated but has been established for much longer. AFCLC is the newest of the DoD military branch culture centers and its benefits are still being fully realized by the AF community.

Conclusion

In the AF, an effective multi-cultural, international construction team would ultimately be a team that reached the completion of a project with clear communication, on budget, on schedule and meeting all specs or mission requirements. Many of these variables are difficult to measure or compare as each overseas project has a different path to completion. This study aims to better understand what training gaps there are in CE Officer 3C from both the CE Officer point of view and the host nation perspective and how this relates to the AF's construction success overseas. By understanding current models of culture and values, best practices in training and the theory behind the independent variables tested in these surveys, the importance of the topic can be understood. While the emphasis on 3C is evident in recent military guidance, currently there is little to no formal training for AF CE working in overseas locations.

,III. METHODS

Purpose of Investigation and Theory

Air Force CE Officers currently receive little to no cross-cultural training before arriving on station at overseas bases where much of their job will depend on their competence to work with international host nation partners and those of different cultures. The overall purpose of this research is to identify strengths and weaknesses of the current CE Officer 3C training program and to advise leadership on a suggested approach to fill the training gaps. Improving AF CE Officers 3C will assist greatly in engineering and mission success overseas. Understanding how cultural differences and collaboration efforts are viewed, from both CE Officers and from host nation partners, will aid in creating a stronger, more robust training plan that meets the intent of the Chief Of Staff of the Air Forces LREC Capability Guidelines ("CJCSI 3126_01A, 2013).

The research was conducted in a three-phase sequentially exploratory mixed methods qualitative design. The first phase was the extensive literature review that identified relevant factors from psychology, international human resource management, business management, and construction management to define realistic independent and dependent variables that could be later tested. The second phase of the methods was an anonymous survey study conducted amongst AF CE Officers. The third phase was an anonymous survey study conducted amongst 42 host nation partners from 4 countries.

Survey 1

The main form of data collection for the first part of this study comprised of a semi-structured, paper administered, multiple-choice survey given to a purposeful sample where the researcher selected individuals that are key informants in the subject matter (Patten, 2009). Members had 4-15 years' experience in AF CE. Questions investigated the most recent overseas assignments that members had been on to include deployments, long tours and short tours, as well as the collection of their overseas military construction experience. Sample questions are located in Appendix I. Many of the same questions Boney used in her Delphi survey were modified and used again to verify the results on a grander scale (Boney, 2017). The anonymous survey was distributed by purposive sampling to 95 military members attending various flight leadership training at the Civil Engineer School at Wright Patterson Air Force Base. The survey was placed in their course introduction packets to be completed voluntarily and at their convenience (Patten, 2009). Variety in the sample was essential to the quality of data obtained for this qualitative research. Studies show that the length of the survey is correlated with the number of responses so it was important to limit the number of questions to only those absolutely necessary, to increase participation (Treat, 1995). This sample was designed to examine a range of experience and of cultural complexity on projects. By utilizing higher ranks, it assured that many participants had overseas assignments and held some sort of leadership position during these. Members of these ranks have a long-standing familiarity with managing projects and construction in the AF, allowing for a diverse pool of experts. By gathering data on the most recent assignment, it limited results that could reflect outdated practices and training.

The first section of the survey given to CE Officers aimed at understanding the type, amount and effectiveness of the cultural training received by members prior to or shortly after arriving at their most recent overseas assignment. The second section aimed at understanding culture related challenges for CE Officers when working on cross-cultural teams and overseas construction. Allowing members to add answers as necessary to multiple choice questions and offer feedback at the end of each section added flexibility in answering and accounted for answers that may not have been available otherwise. Using anonymous and voluntary surveys allowed for sincerity and freedom in reporting true thoughts without fear of retribution. Analysis of survey one was done using Excel plot functions to compile a list of data trends, common concerns and suggested training practices.

Survey 2

The main form of data collection for the second part of this study comprised of a semi-structured, electronically administered, multiple-choice survey given to a specific sample of people. The researcher used AF CE Officers to forward a survey link to host nation counterparts that worked in or with their squadron at overseas bases. These LNs interacted with AF construction or engineering related tasks on a daily or weekly basis overseas. Participation was optional, and members had 28 days to complete. It is estimated that the survey was sent to 120 people. Questions investigated the person's experiences working with AF CE Officers and on military overseas construction to better understand what issues, related to culture, arise most in overseas projects.

The bases and locations which the survey was sent to can be found in

Table *2* below, which represents all the major overseas AF bases and major commands. The time to take the survey was limited in this study; therefore, only four locations responded to the request for volunteers. The survey was created to take approximately 15-20 minutes and comprised of three sections. The English version of the survey can be found in Appendix I. The first section was 14 multiple choice questions with the option to add answers. Five of eighteen questions aligned with those asked to AF CE Officers in Survey 1 to compare results on things such as, common overseas construction issues and the definition of 3C. The other questions addressed items such as language spoken, and cultural training received. The second part of the survey was comprised of 42 statements to be ranked using a 7-point Likert Scale (Boone et al., 2012). The number of questions were chosen to optimize the results while still limiting the time it would take a participant to complete the survey; the more questions a survey has, the less time respondents spend answering each question (Chudoba, 2018). The study formed 3-7 statements to test each independent variable.

Table 2: Survey II Base Distribution Locations

Country	Base
Germany	Ramstein AB
	Spangdahlem AB
Hungary	Papa AB
Italy	Aviano AB
Japan	Yokota AB
	Misawa AB
	Kadena AB
South Korea	Kunsan AB
	Osan AB
Portugal	Lajes Field
Spain	Morón AB
Turkey	Incirlik AB
UK	RAF Lakenheath
	RAF Mildenhall
Guam	Anderson AB
Honduras	Soto Cano AB
Qatar	Al Udeid AB
Afghanistan	Bagram Airfield
Greenland	Thule ABS
Kuwait	Ali Al Salem ABS
United Arab Emirates	Al Dhafra AFD

Analysis began once all the surveys were collected through SurveyMonkey (SurveyMonkey, 2019). Inherently, the characteristics being measured by this survey were difficult to validate, which is why multiple statements and questions were used to

test each variable. First, the results of the multiple-choice questions were examined using graphs and charts in Excel and compared to the responses of US AF CE Officers. Next, the Delphi measures were evaluated. Descriptive statistics such as the mean, median, standard deviation and mode of the responses for each of IV measures were calculated to help understand the difference between the respondents and possible causes of error or variability (Patten, 2009). Reliability or internal consistency of the questions within each independent variable was measured using a Chronbach alpha, which is the extent to which all the items in a test measure the same concept or construct (Tavakol & Dennick, 2011). Cronbach's alpha reliability coefficient normally ranges between zero and one, but there is no lower limit to the coefficient (Gliem & Gliem, 2003). There are many arguments as to what an acceptable coefficient is. George and Mallery provide the following rules of thumb: "> .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable" (George & Mallery, 2006). Murphey and Dodshire claim that anything over .6 is low level but still accepted for preliminary studies such as this one (Murphy & Davidshofer, 2004). For this research, alpha was measured using the program statistical software program called JMP and anything above .6 was found acceptable while those above .8 were optimal (SAS, 2018). There was a chance that specific questions could be misinterpreted due to language translate or other factors. Any set of questioned with a Cronbach's alpha less than .6 was further investigated for errors in wording nor interpretation. Questions which clearly did not fit within the model were removed from the study at this time. The remainder of data was analyzed with the understanding that the lower the alpha, the lower the chance of getting significant results and correlations.

Next, a multivariate analysis was done using the means across each IV to produce a Pearson Correlation chart (Sedgwick, 2012). Positive correlation values with a p value $< .05$ were determined significant and conclusions were drawn from this. Lastly, in order to investigate the additional nine hypotheses, a non-parametric Kruskall-Wallis test was done (Theodorsson-Norheim, 1986). The effect size needed to do a parametric one-way analysis of variance (ANOVA) was 26, but since the number of participants that fell within each category (location, tour type and job position) was not this high, a normal distribution could not be assumed (Sullivan & Feinn, 2012). The Kruskal-Wallis is a nonparametric statistical test that assesses the differences among three or more independently sampled groups, such as job position, on a single, non-normally distributed continuous variable such as location (McKight & Najab, 2010). This test provides an F-statistic falling within a Chi-distribution and a resulting p-value that can reject or fail to reject the null hypothesis based on the given confidence level (Theodorsson-Norheim, 1986). For this study, a p-value of 0.05 was used, meaning that the results were accepted with 95% confidence. For $p < 0.05$, the study rejected the null hypotheses and supported the alternative hypothesis that the mean values between the models are different. Additional training suggestions can be made by understanding if location, host nation partners job position or tour type influences measures. The results of these studies are published in Chapter 4.

IV. RESULTS

Typically, the results of a survey study consist of both qualitative and quantitative responses. The outcomes of this exploration are placed in the conclusion in Ch. 5 and include a list of actionable skills and focus areas that the DoD, and more specifically Air Force CE leadership, can use to better facilitate 3C training efforts.

Survey I Results

The first multiple choice survey was given to approximately 110 USAF CE Officers attending various flight and squadron leadership courses at the Air Force Civil Engineering Schoolhouse throughout the month of March 2018. The survey asked about the participants most recent overseas assignment to include deployments, short tours and long tours.

Demographics

The survey was taken by 52 members of which 37 were valid and usable data points. Those that were invalid included civilians, enlisted ranks and those that did not complete most or all the questions. As shown in Figure 7 below, 92% of survey participants were male. 13% were of the rank of Captain (O3), 58% of the rank of Major (O4) and 29% of the rank Lt Colonel (O5). The job positions held by the officers in the group included: Squadron Commander, Squadron Deputy Commander, Operations Flight Commander, Engineering Flight Commander, Installation Support Officer, Construction Manager, Director of Engineering and Forward Posture Commander. All participants had been stationed overseas and 35% had been assigned all three (short tour, long tour and

deployment) during their career. While subjects were only asked about their most recent assignments, the above range of experience speaks to the quality of comments and data collected.

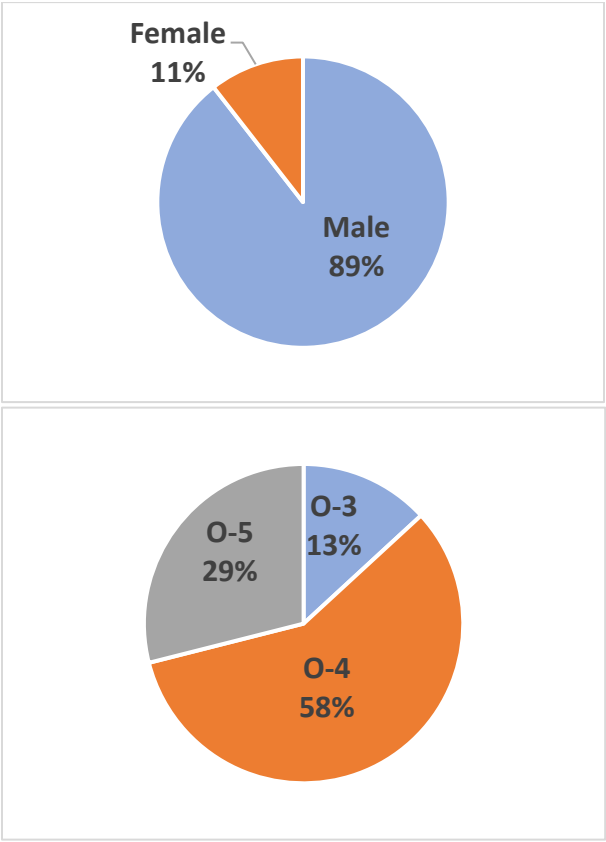

Figure 7: Survey I AF CE Officer Grade and Gender Demographics

Section 1 Results

In section one of the survey, participants were asked to list their experiences for their most recent overseas assignment to include the following:

- type of tour (short, long or deployment)
- number of hours interacted with LNs weekly
- method and number of hours of language or cultural training received

- the adequacy of this training for their job duties
- what training they wish they received more of
- should there be a requirement for cultural training prior to CE OS assignments

The results for this section are broken out based on tour type. The sample represents experiences from all the major AF overseas locations in the four reginal AORs with a high percentage of CENTCOM tours. The text highlights important statistics to be discussed further at the end of this section.

Deployment

Deployments are generally unaccompanied, or without dependents, to an overseas combat zone for a period of six months to one year. Commonly US Air Force CE members are co-located on one base with other branches of the US military or foreign national militaries. These bases are often maintained by AF Civil Engineers, even when the main mission of the base is that of another branch such as the US Army. These tend to be short-term bases, built with local materials and local national contractors, and the bases have a 10-year life expectancy. Due to frequency and length of this tour type, 54% of participants listed their most recent overseas tour as a deployment of which 94% were to the Central Command AOR (CENTCOM), which includes central Asia and the middle east.

The data for this survey is shown below in Figure 8 to Figure 11. Of the members that most recently went on deployments, 14% did not interact with host nation partners or local nationals weekly. This is likely due to the type of job they held. The majority, 81%, spent between 1 and 30 hours. Most of the cultural training received was CBT or after

arrival on the deployment site through either immersion, OJT or during turnover. This cumulated in under 2 hours of total cultural training for 55% of respondents. Of the respondents, 68% found the training adequate for their job duties while 32% found that it was partially or fully inadequate. This data is consistent with the previous Delphi study (Boney, 2017). Respondents listed classroom training as their preferred method of training in which they wish they would have received more, with immersions and OJT as a close second.

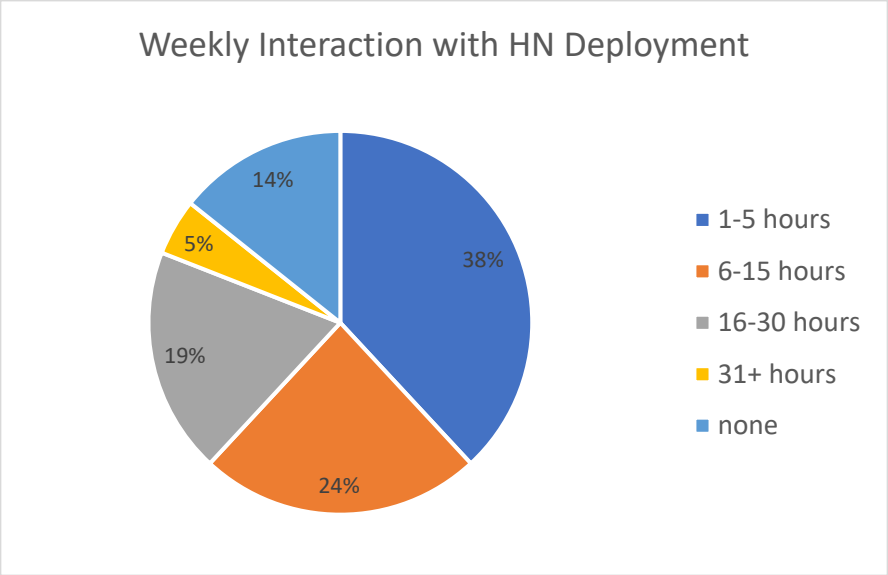

Figure 8: Weekly Interaction with Host Nation Partners at Deployed Locations

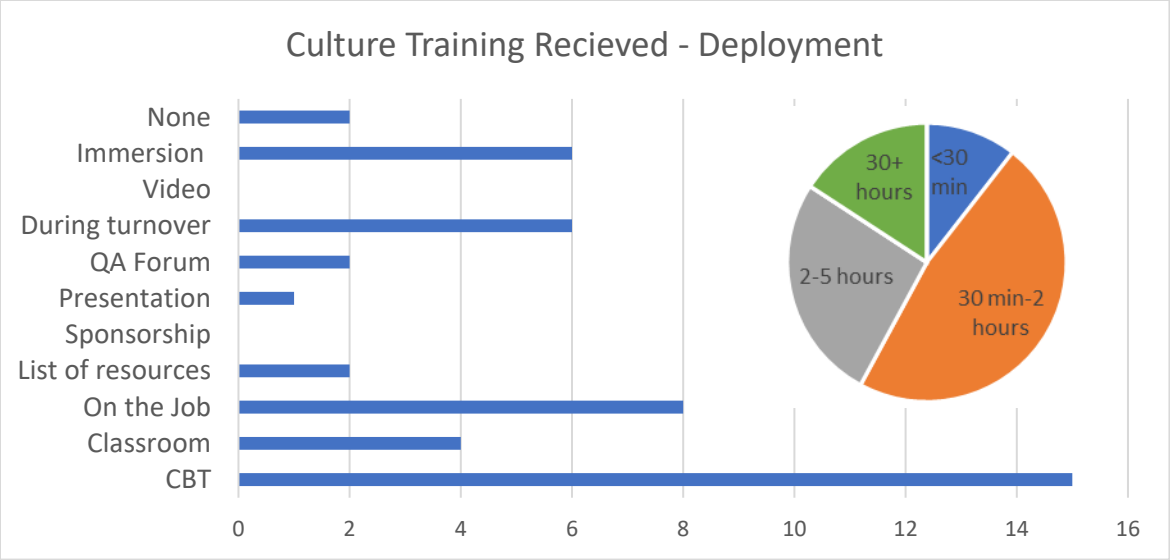

Figure 9: Cultural Training Received Prior to or During CE Officer Deployment

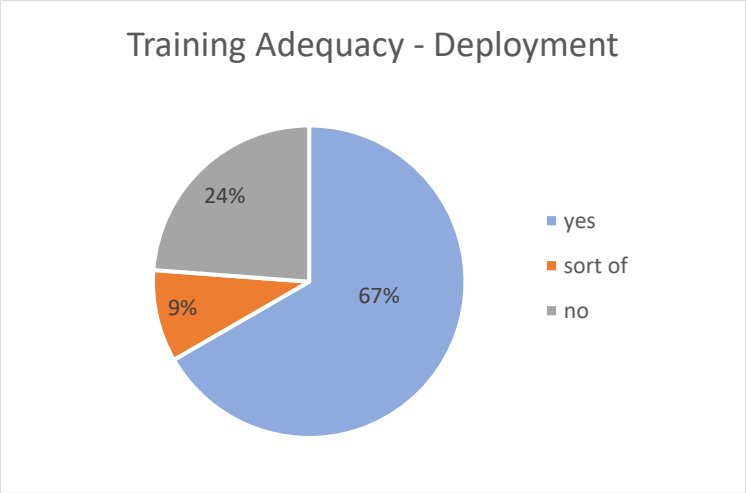

Figure 10: 3C Training Adequacy for Deployments

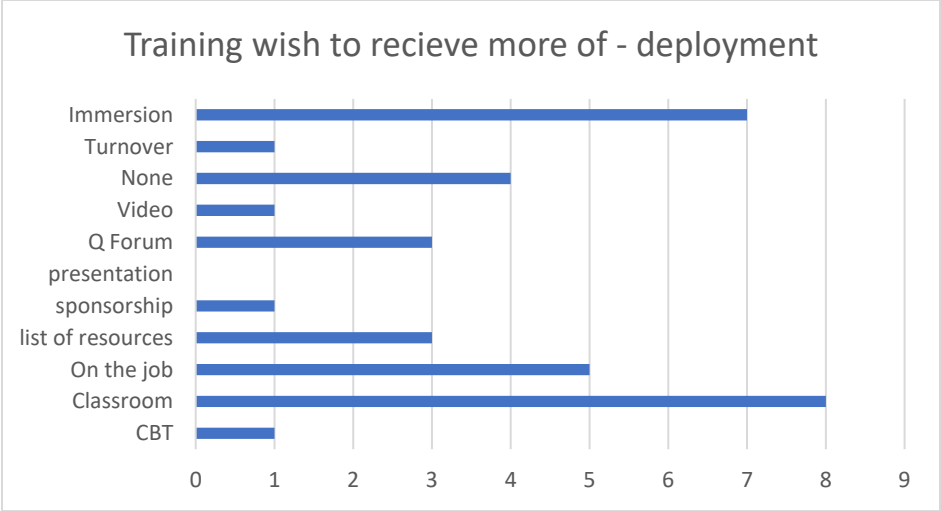

Figure 11: Training CE Officers Wish they Received More Of

Long Tour

Long tours are 2-4 years, usually accompanied with dependents, to a non-combat zone not within the lower 48 US states. These include Hawaii and Alaska, but data points from these two locations were omitted for this study. Results of this part of the survey are shown in Figure 12 to Figure ***15***. Of the members, 27% listed a long tour as their most recent assignment and 60% of these assignments were to locations in the Pacific, such as Japan and Korea. The other 40% were to European countries, such as Germany and the UK. The number of members who worked with host nation partners 30 or more hours a week was 60%, which was much higher than those on deployments. The majority received training after arriving on station through immersion, OJT or during turnover, with no more than five total hours of training received by anyone. Over half found this training adequate for their job while 33% found it met some or none of their job requirements, consistent again with the previous Delphi study. Respondents wished they has received more training in the form of immersions, classroom and Q&A forums.

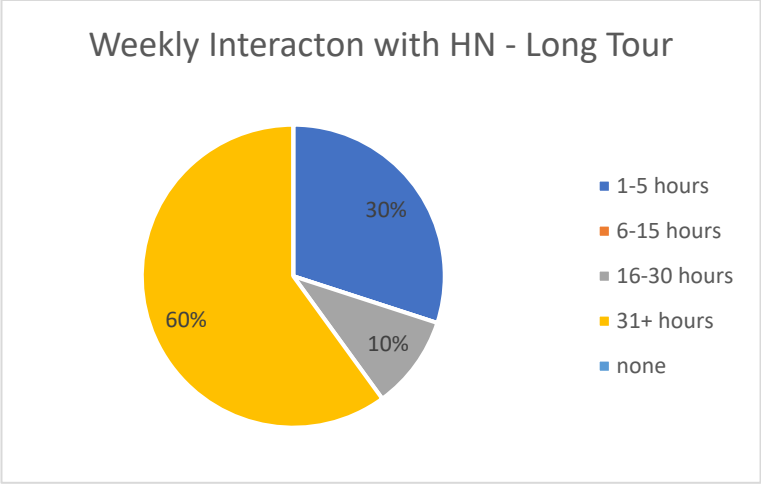

Figure 12: Weekly Interaction with Host Nation Partners at Long Tour Locations

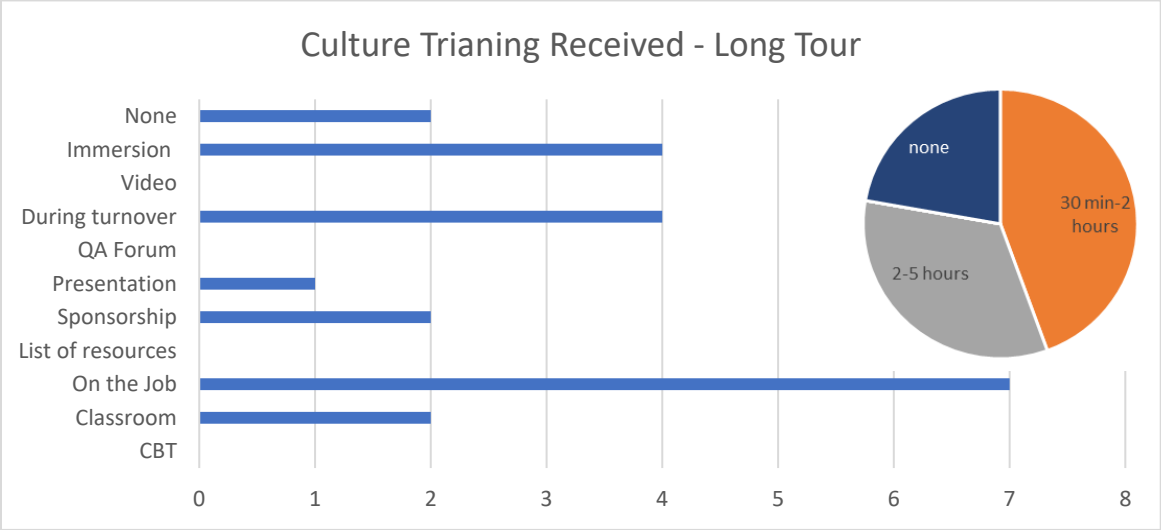

Figure 13: 3C Training Received Prior to Long Tour Assignment

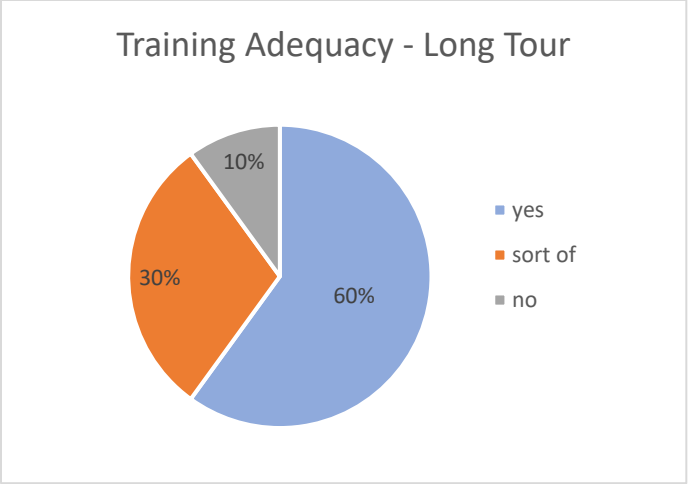

Figure 14: 3C Training Adequacy for Long Tours

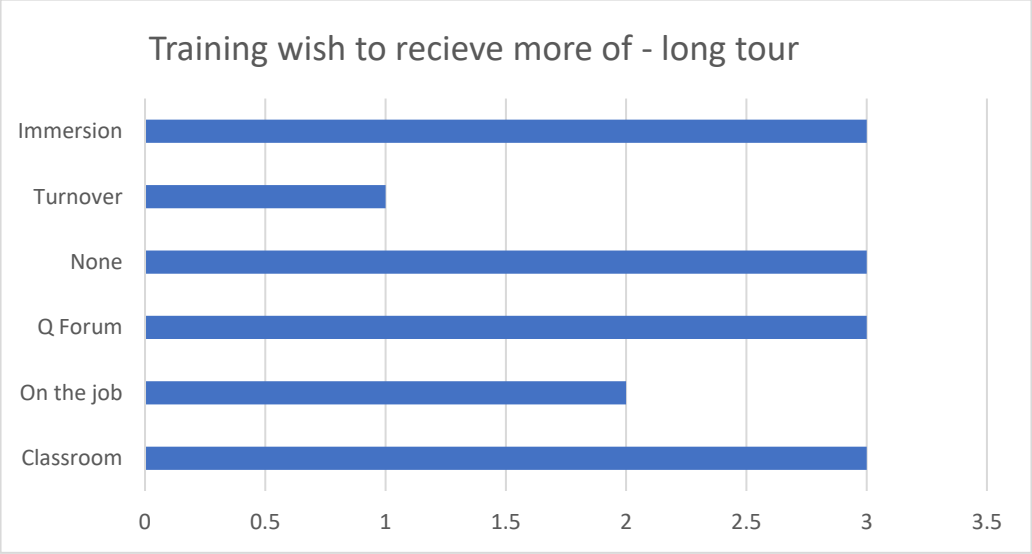

Figure 15: Training CE Officers Wish they Received More Of

Short Tour

Short tours are 1-year assignments, most of which are to places where members cannot bring dependents, such as parts of Korea, Turkey and Honduras. Of the 19% that listed a short tour as their most recent overseas assignment, 60% were to CENTCOM and 40% to the Pacific. The data for short tours are shown below in Figure 16 to Figure 19. Of the short tour members, 57% interacted 30+ hours a week with LNs at their jobs and

25% received extensive training of 30+ hours while the rest received 5 hours or less. Most of the culture training was received via CBT and OJT. Less than half found this training adequate and higher than deployments and long tours, 60% found it lacking or not adequate for their job duties. Those that received extensive training held commander positions in the CENTCOM AOR and all found their training adequate for their job duties. The preferred method of training was classroom and on the job.

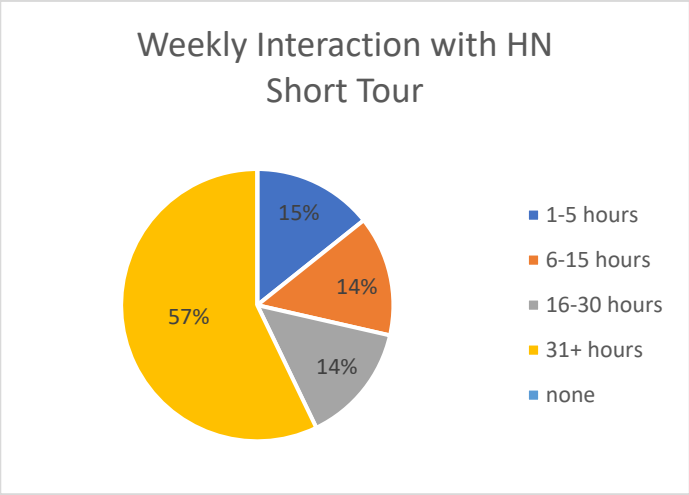

Figure 16: Weekly Interaction with Host Nation Partners at Short Tour Locations

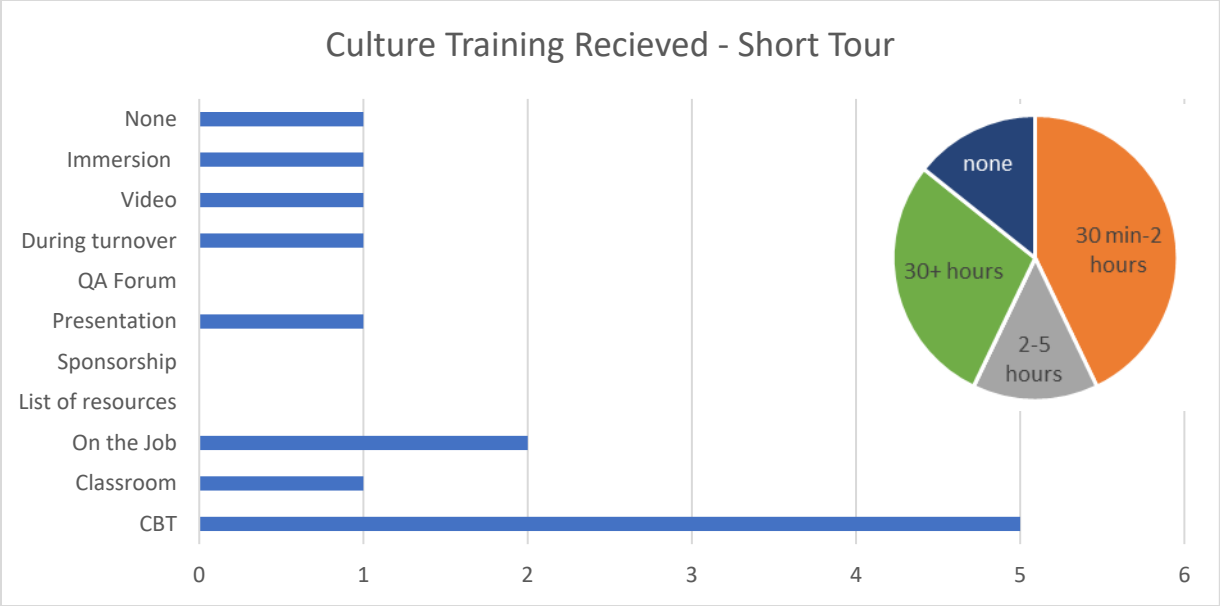

Figure 17: 3C Training Received Prior to Short Tour Assignment

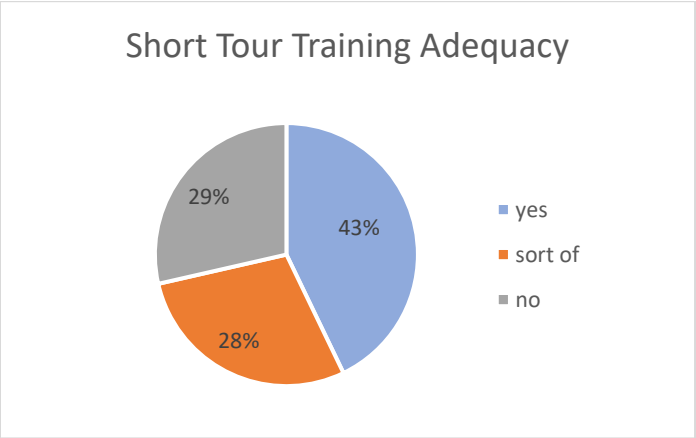

Figure 18: 3C Training Adequacy for Short Tours

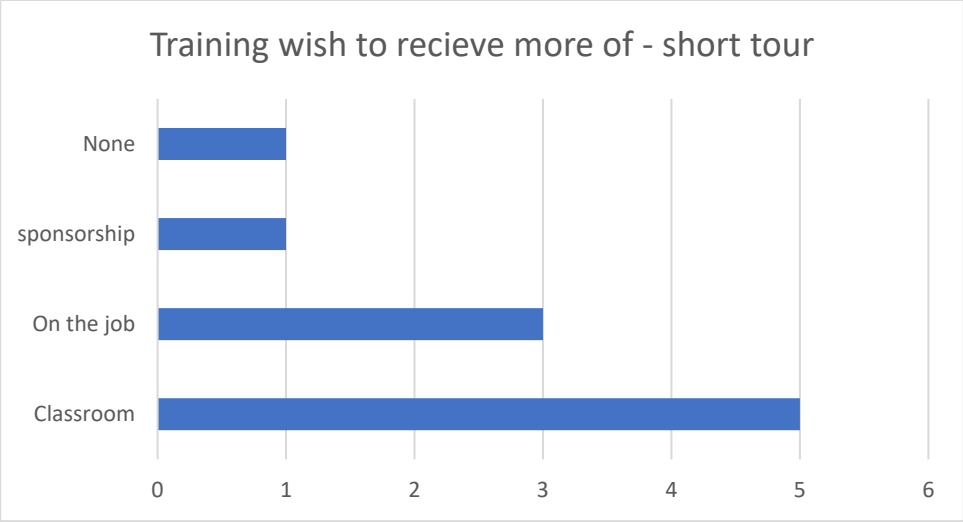

Figure 19: Training CE Officers Wish they Received More Of

Analysis of Section I

This study found that 92% of CE Officers overseas are interacting at least weekly with host nation personnel, no matter the tour type. It should also be noted that members on short and long tours interact more heavily with local nationals based on hours per week, as compared to those on deployments. This could be explained by a few factors. First, the members being surveyed were of higher ranks and may have held leadership positions, which pulled them from the field work that may handle project coordination with the host nation people. Also, units at most short and long tour locations hire LN employees to work within the squadron requiring more daily interaction with LNs. The study showed that more cultural training hours were required prior to deployments but this does not correlate with the amount of interaction members are getting.

The type of training given was also studied. Overall, 70% of survey participants feel that cultural training should be required prior to AF CE Officer assignments overseas. 40% of AF CE Officers felt unprepared to face the cultural challenges of their

overseas assignments. CBT requirements are a common form of cultural training for any tour but especially for deployments. During turnover or on the job were the other two most common training approaches, neither of which are formal processes or standardized. The number of hours of cultural training received was before or during one specific assignment, not the total collective amount of training someone may have received over their career. For some, this is the only training they have received ever while others, especially those higher in rank with many deployments, have received the same training multiple times. Overall, most AF CE officers receive between zero and two hours of cultural training. It appears that the longer trainings (+30 hours) are given to pre-deployment officers holding command positions to the CENTCOM AOR and those that took this extended training, felt adequately prepared.

While 60% of officers found the received training as adequate to meet their job duties, they also preferred classroom training over CBTs. OJT, question and answer forum and immersion were also highly chosen as better training options. This aligns with the theory about training as outlined in the literature review. Only 6 out of the 38 participants received classroom training (15%) but 16 participants (42%) would like to see this incorporated into the culture training program. On the opposite side, only 1 participant wanted more CBT's while 20 participants were required to take CBTs

Overall, the study showed that the Air Force has some successful CE Officer culture training practices and methods but should re-align policy to prepare not only for deployments, but short and long tours as well. See the recommendations section for ways to better programs to fill these training gaps.

Section II Questions and Results

Section II of the survey was used to better understand specific overseas construction and engineering experiences between AF CE Officers and local nationals to identify common cultural issues and concerns. Written comments were also given, which are discussed further below.

The following questions were asked in section II:

- What does cross-cultural competence mean to you?
- What are the key factors that make up cross-cultural competence, and culturally acceptable skills and behaviors?
- What is most advantageous to know and understand before working on a cross cultural construction team?
- When do you think it is best to learn about the host nation's culture and working in cross cultural teams?
- What are the largest obstacles when doing construction and civil engineering in overseas locations?
- What are the largest cultural obstacles when doing construction and civil engineering in overseas locations?

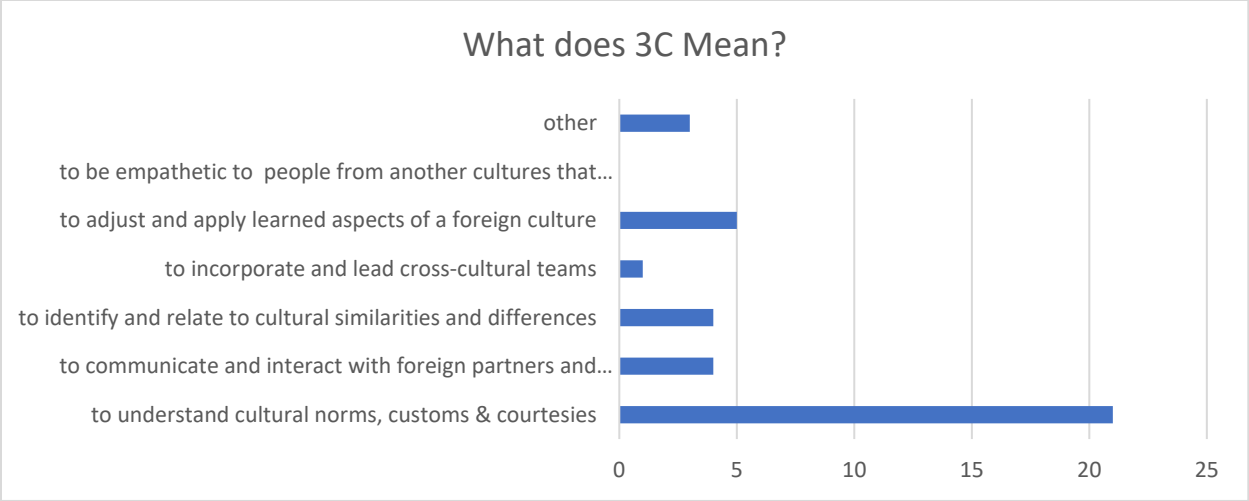

Figure 20: Q3a 3C Meaning

The most common answer by a significant margin, shown in Figure 20 above, was "to understand cultural norms, customs and courtesies". One member further added it meant "to effectively interact with foreign partners resulting in positive outcomes."

Question 3b, Figure 21 below, being respectful, self-aware and open to different perspectives were the top three choices for important cross-cultural skills. There were many responses that were highly chosen and should be considered in future training.

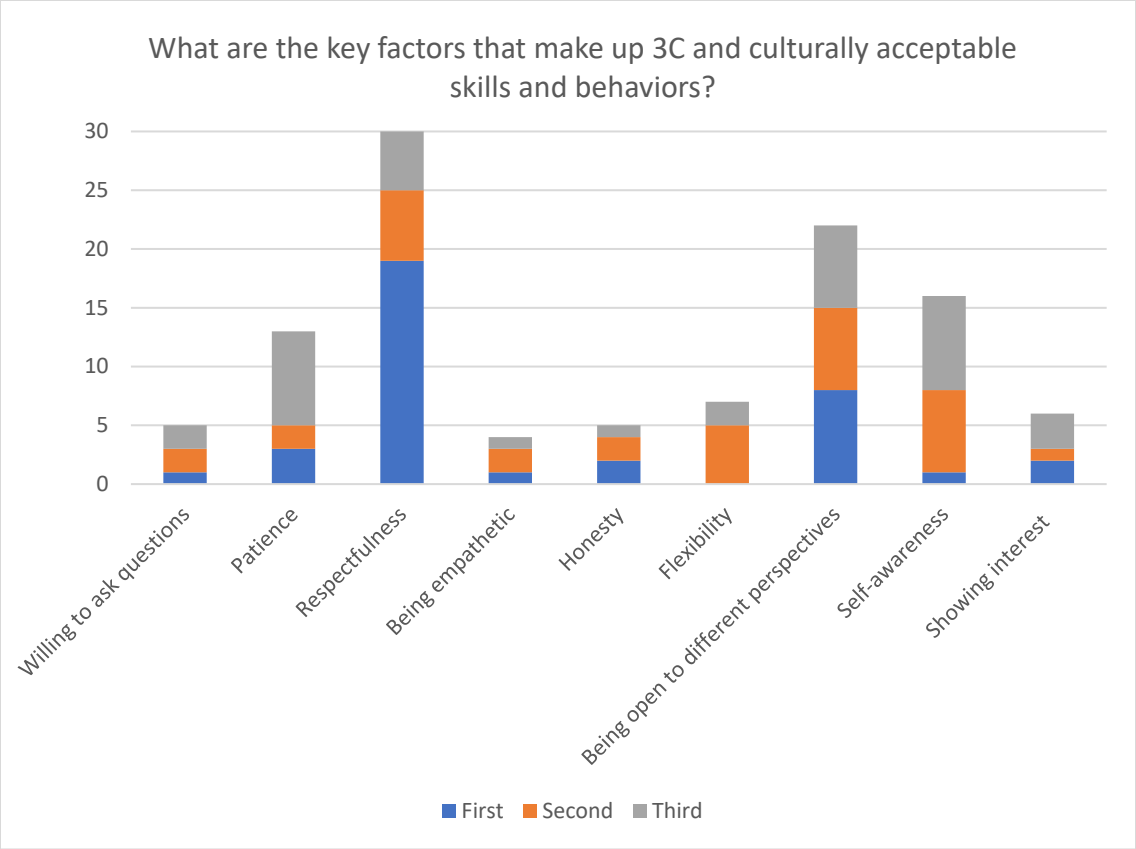

Figure 21: Q3b Key Factors that make up 3C Skills and Behaviors

The most advantageous knowledge that CE Officers felt they should know and understand was cultural norms, HN work customs and customs and courtesies.

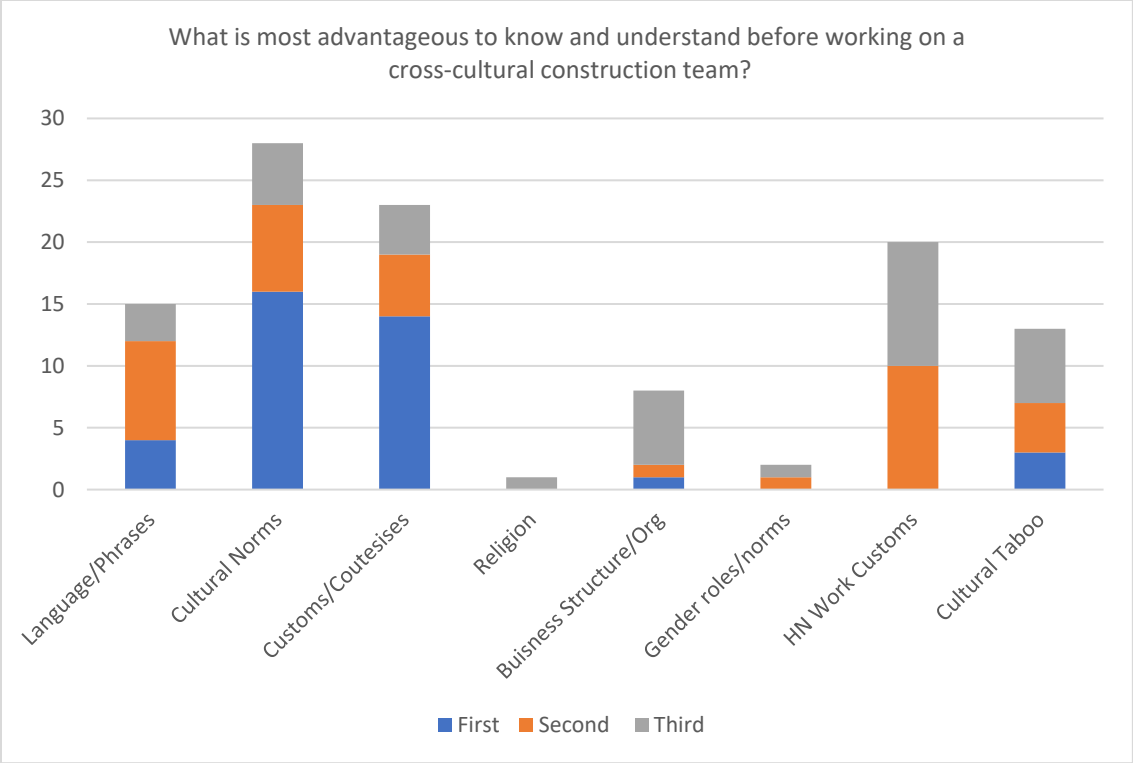

Figure 22: Q3c Knowledge that is Advantageous for Working on 3C Construction Teams

As shown in the two questions in Figure 23 and Figure 24 below, 25% of members did not feel that training should be mandatory for CE Officers prior to going to overseas tours while 68% said it should be. The overwhelming majority believe that training should be done prior to arriving at an overseas location as opposed to another time. The comments give further insight as to when personnel think this training should happen.

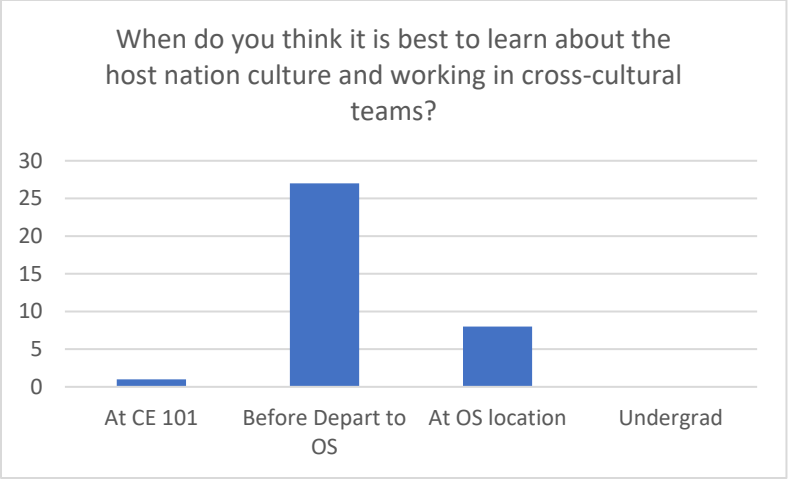

Figure 23: Q3d Best Time to Learn About the Host Nation's Culture

Do you think there should be a requirement for cultural training prior to CE OS assignments? (and comments)

"Culture training would help, at least during in processing"

"Cultural training should be part of PCS to OS job"s

"Cultural training should happen once arrived on deployment"

"Training should be a requirement before deployment"

"People assure you don't need cross cultural training in the UK but it would have helped greatly"

"While general cultural competency skills are helpful, most aspects are location specific. I think training targeted toward the deployment location are most helpful."

"A good general cultural awareness of an OCONUS location will provide a solid foundation to guide CE/construction efforts with HN. Aside from specific HN reqs and policies, the cultural awareness will facilitate a good working relationship. applies even to English speak OCONUS locations!"

"Training shouldn't be a requirement in all circumstances"

"Training should be set by local CE/CC and supported by AV"

"Training requirement needs to be specific to the location and include tactical level details"

"Training and immersion should be required including testing and practice before being sent"

"Required training should be based on job requirements with host nation."

"Training should be a requirement depending on job and location. Where more integration/relations are needed, consider training and longer assignments."

"Training should only be required for short tours and deployments, long tours can be learned "

"Should require training for places like AFCENT/PACAF but not for England."

Figure 24: Q3g Comments Regarding if 3C Training Should be Required

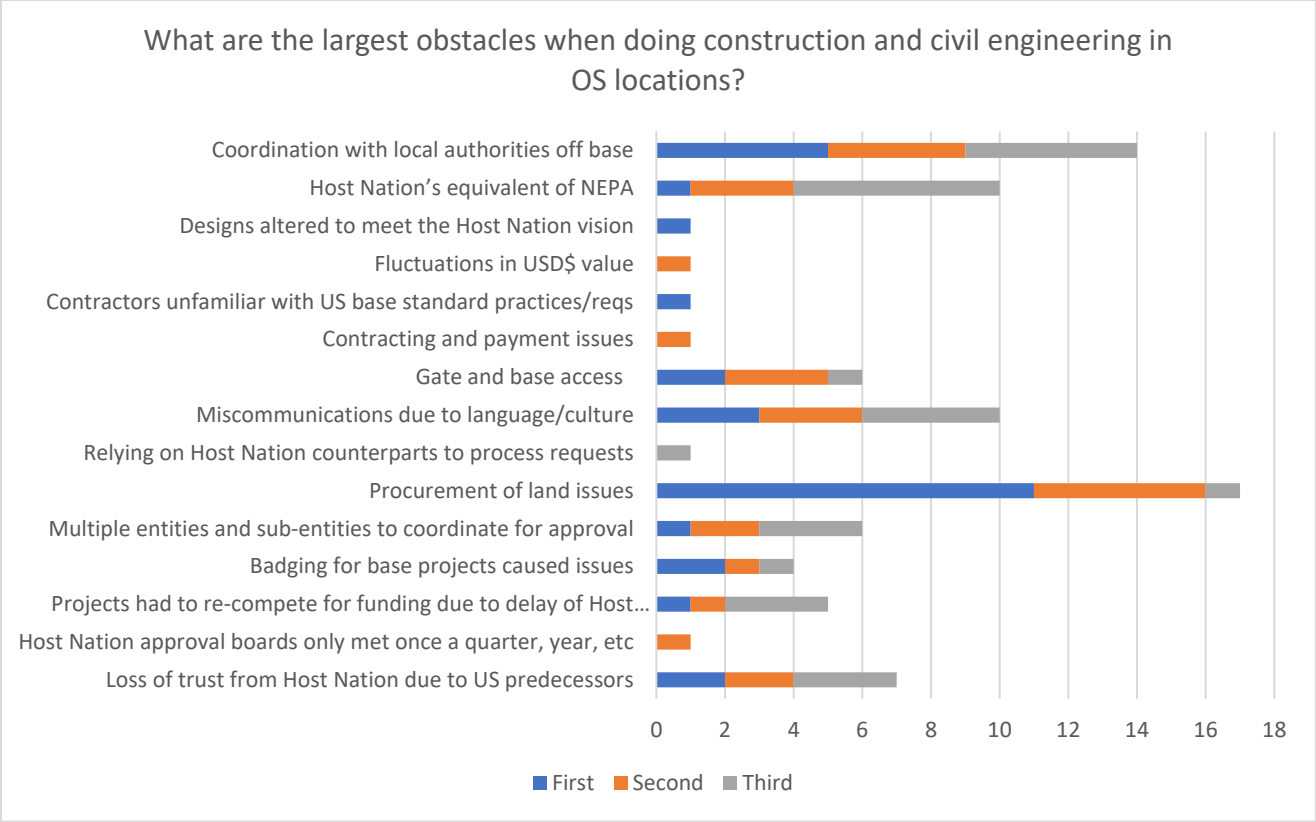

Figure 25: Q3e Largest Obstacles When Doing Construction and CE Overseas

Figure 25 shows the answers for Q3f. Procurement of land, coordination with local authorities, miscommunication and NEPA or environmental standards were all highly noted concerns for engineering overseas.

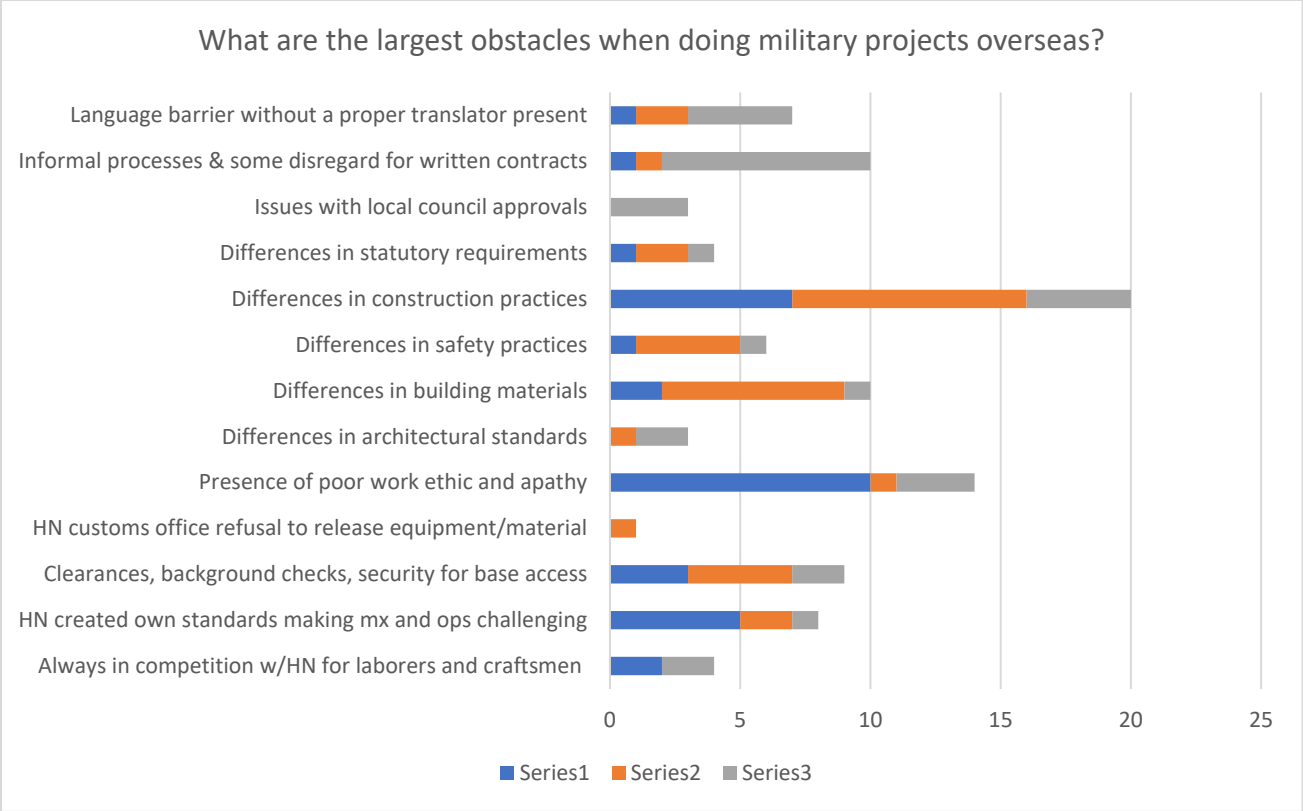

Figure 26: Q3f Largest Obstacles for Military Projects Overseas

Quesiton 3f given in this survey is shown in Figure 26. The three most common issues were differences in construction practices, differences in building materials, and presence of poor work ethic and apahty. Below are the additional answers givenn in the comments section of this survey, Figure 27. While some of these, such as material and labor availability overlap slightly with answers given in the survey, the context and portnetial treatment of each may be differennt and should be considered.

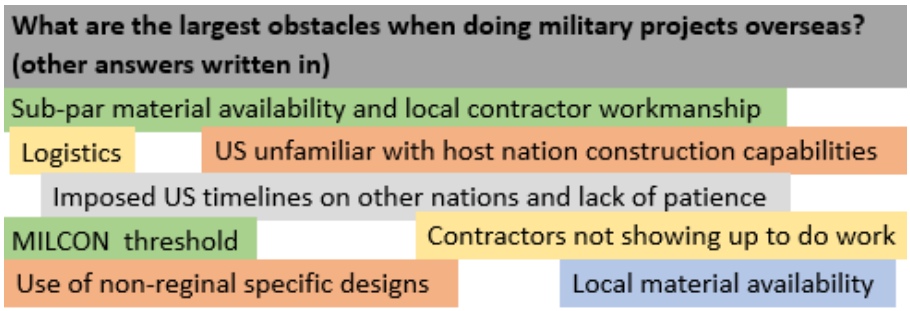

Figure 27: Comments about Largest obstacles with Overseas Projects

The following suggested training programs in Figure 28 could help address this issue but need investigated further, as this thesis study could not acquire a good test to see if and which program may suit AF CE Officers best.

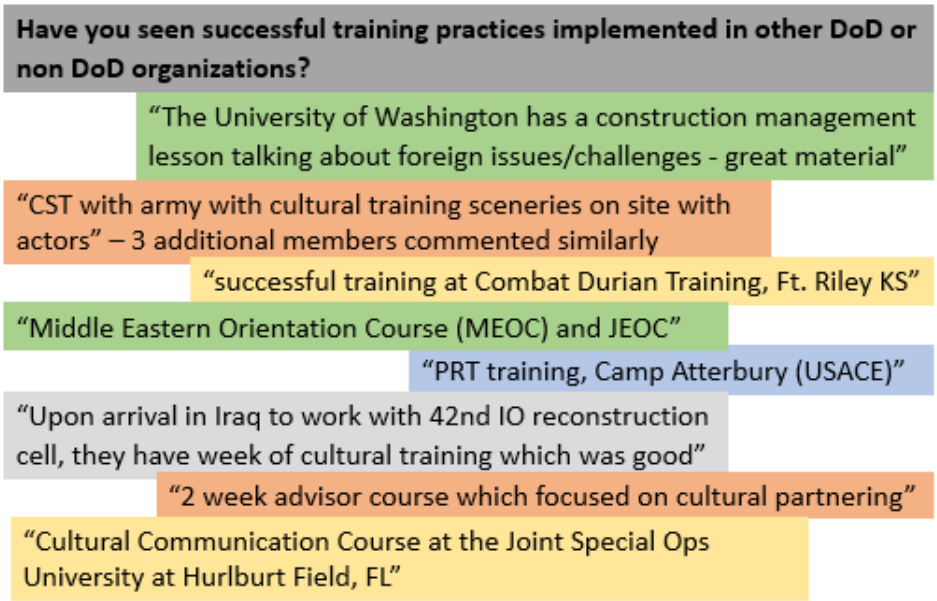

Figure 28: Successful Training Practices Comments from Survey I

Survey II Results

Demographics

A total of 42 participants from 4 countries completed the second survey, as shown below in

Figure **29**. Participation was much more difficult to come by than initially thought but the data represents a wide range of locations, cultures, construction methods and both short and long tour types.

Figure **29**

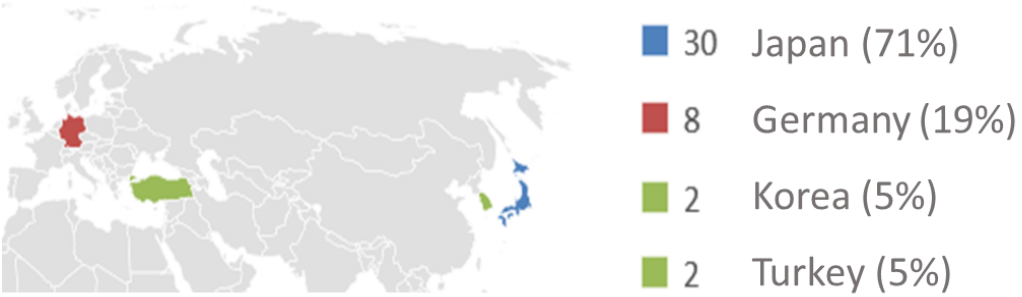

Figure 29: Participant Demographics for Survey II

83% were male. Members had a large range of years of experience working with US construction and engineering projects with almost half having 20+ years (Figure 30). The majority were LN workforce or civilians and worked with as degreed engineers or some type of skilled laborer in the shop or at the front office (Figure 31). Some of the additional jobs included project inspectors and contractors who were not engineers. The question about job title had some ambiguous terms and the results reflect that there may have been a miscommunication. The number of participants that interacted with AF CE Officers at least an hour a week was 71%. The other 28% did not specifically work with officers, but still worked on AF CE construction or engineering projects in some capacity and interacted with CE Military members at times.

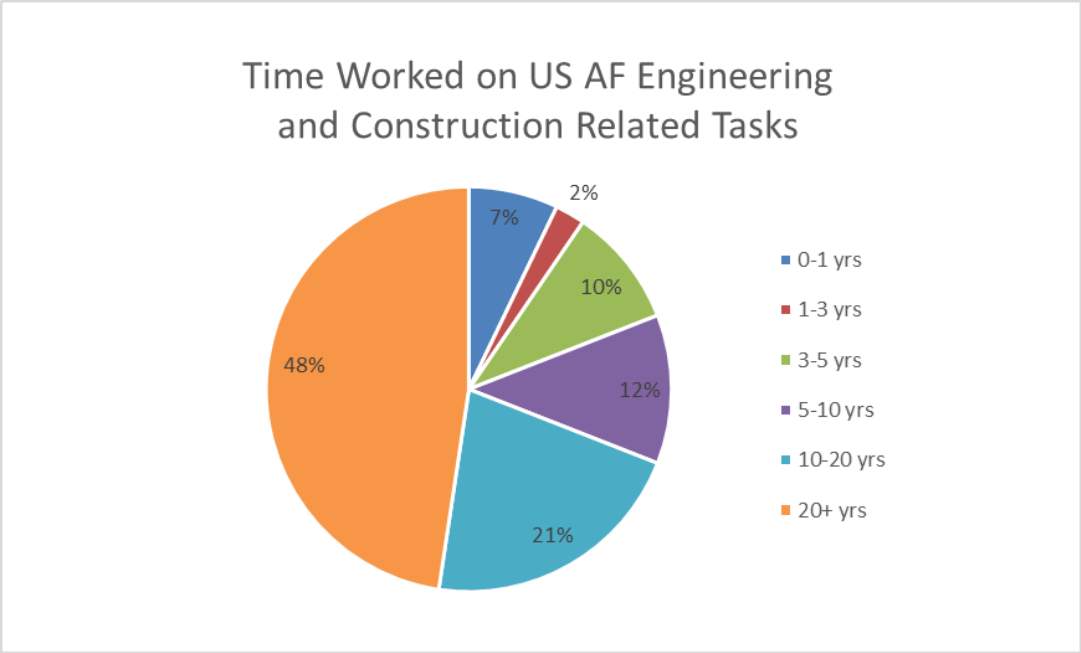

Figure 30: LN Military Engineering and Construction Experience

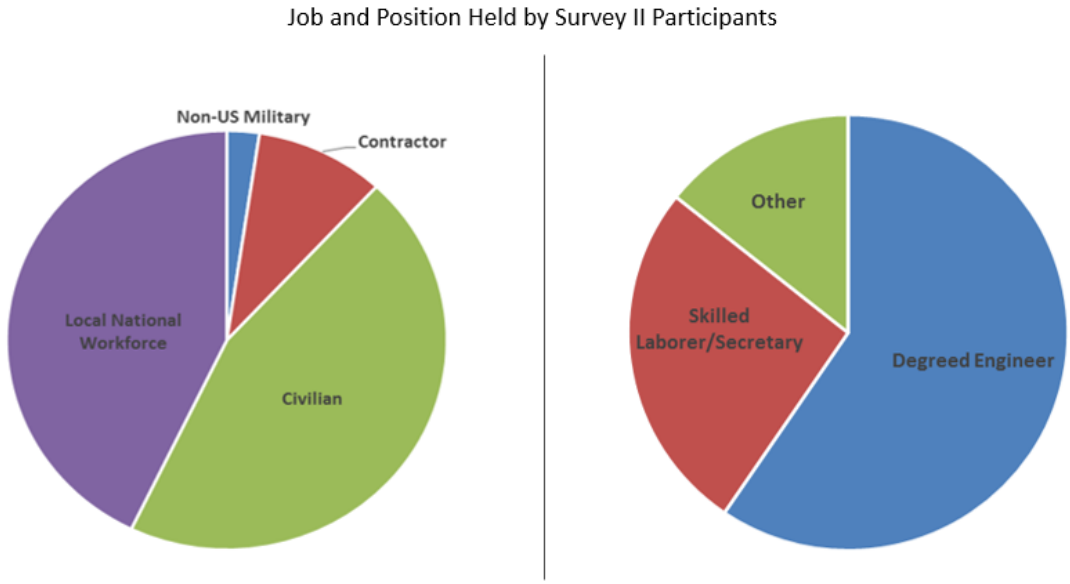

Figure 31: Job Title and Position Distribution for Survey II

Section I General Questions and Results

The number of LNs who received some sort of cultural or language training was 72% and of these 55% received it in higher education. Those that did not receive any

training all felt they should have. In general, host nation partners receive more training than CE Officers in regard to culture and language and are likely better equipped to face the cultural challenges of working on US construction projects.

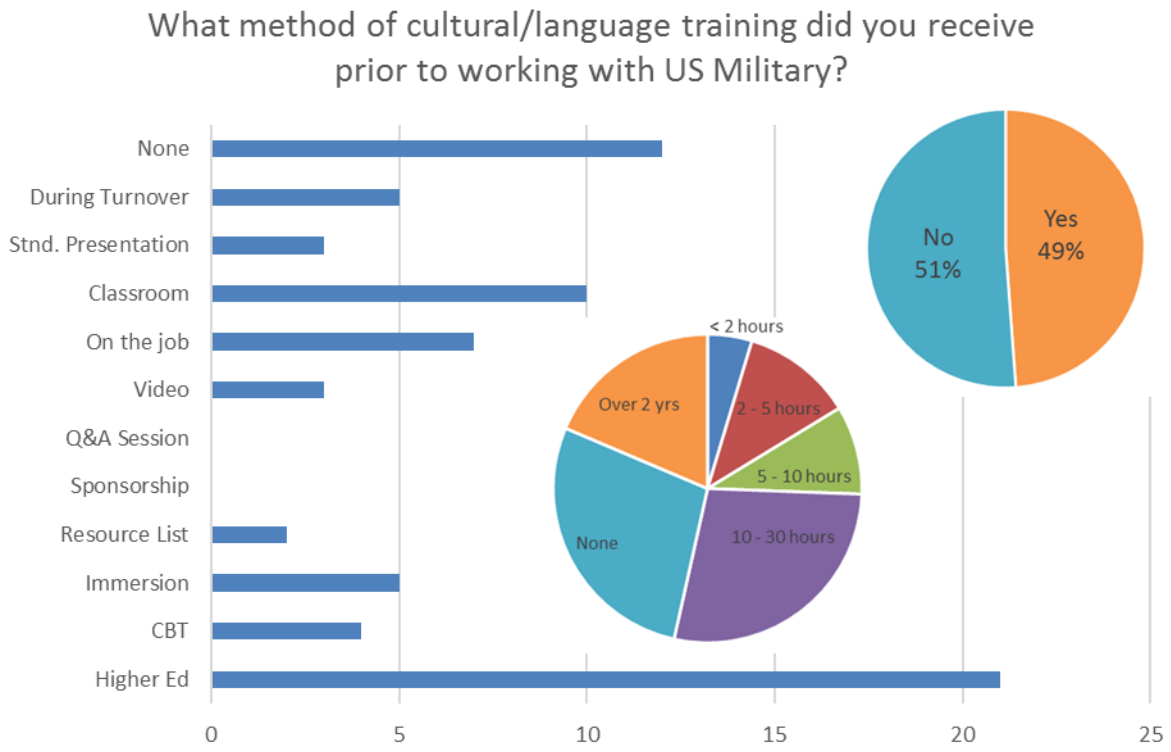

Figure 32: Q1-3 Method and Time of 3C Training Received by LNs

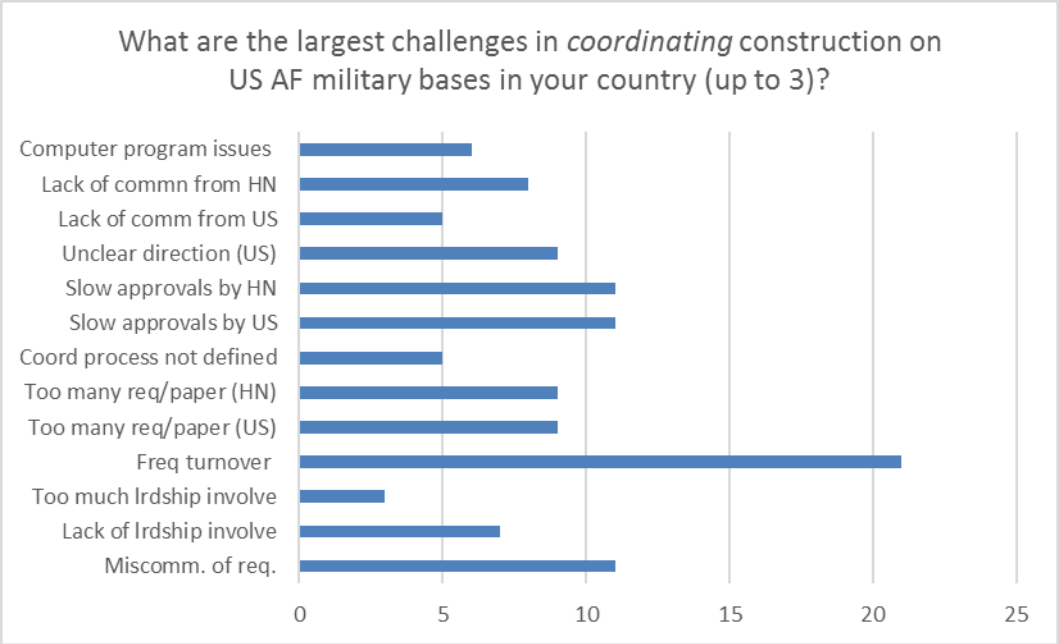

Figure 33: Q4 Largest Challenges in Coordination Construction

Frequent turnover, slow approvals, miscommunication and unclear direction were all commonly listed issues when coordinating construction. The commonalities between these responses and those of AF CE Officers will be discussed in the conclusion.

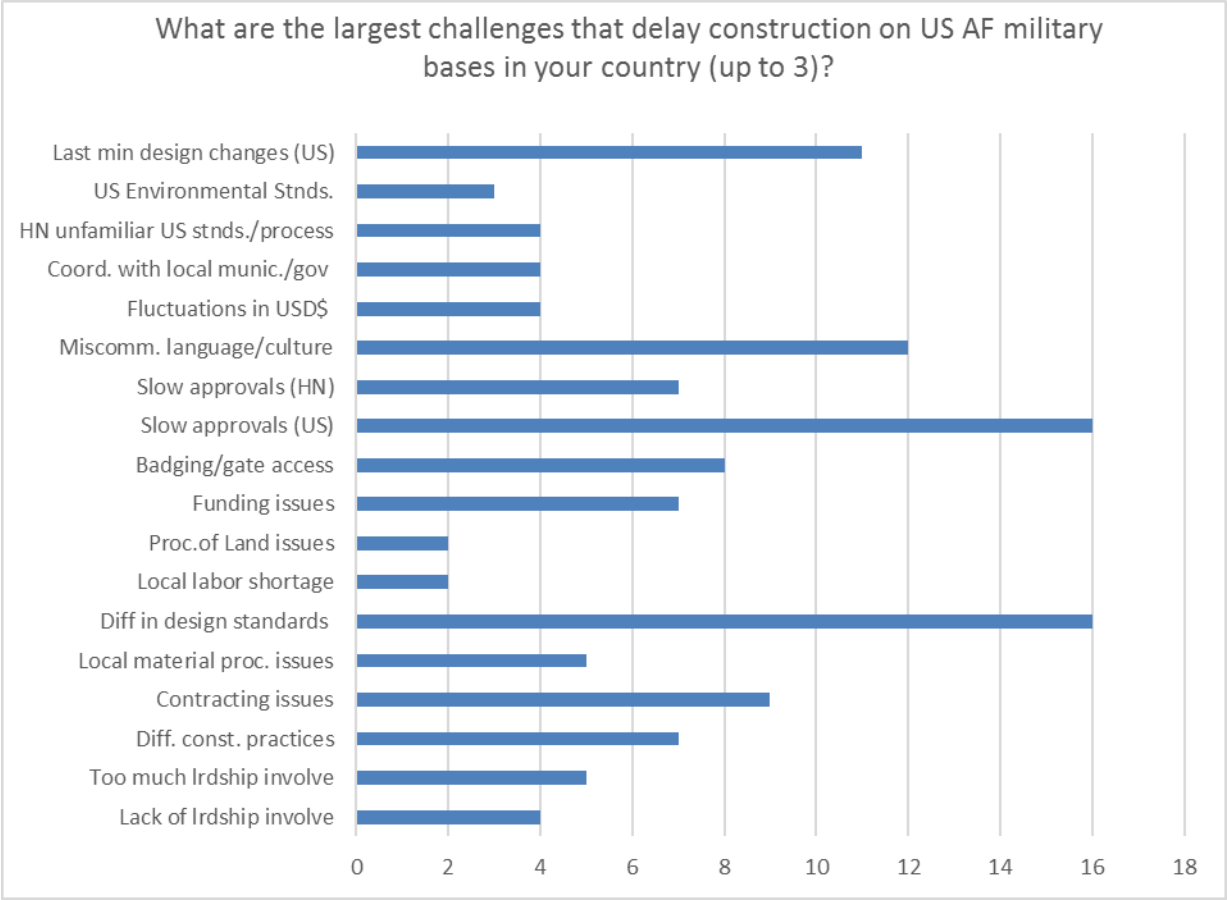

Figure 34: Q5 Largest Challenges that Delay Construction

One large difference between the LNs responses to this question and the CE Officers was that the US listed procurement of land issues as very high while design standards were listed very high for host nation partners. Slow approvals were also very high, both on the US side and the HN. Miscommunications in language and culture ranked third, which aligned with the US's view as well. Badging and gate access, contracting issues and last-minute design changes are all things CE Officers and leadership can work to improve on at their overseas bases. There were many additional answers given for this question as listed below and many overlap the responses given in the first survey by CE Officers.

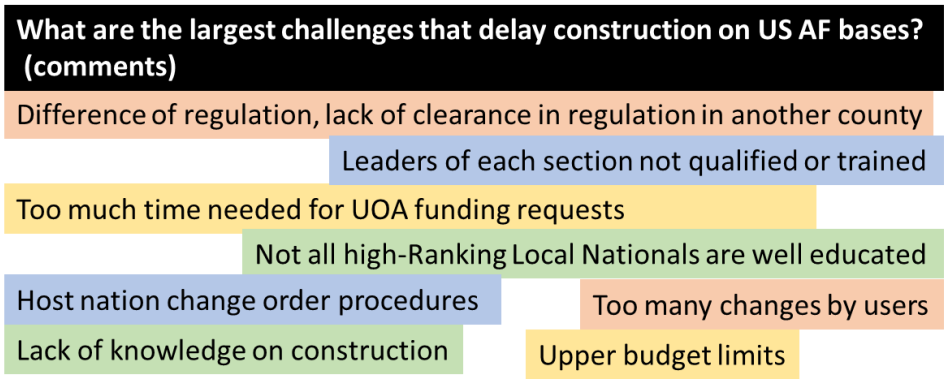

Figure 35: Comments about Largest Challenges that Delay Construction

Both US and foreign LN's had similar views on the meaning of cross-cultural competence with the highest ranked being to understand cultural norms, customs and courtesies. This shows that both surveys had a baseline of understanding of the main topic, 3C and helps validate comparisons between the two views.

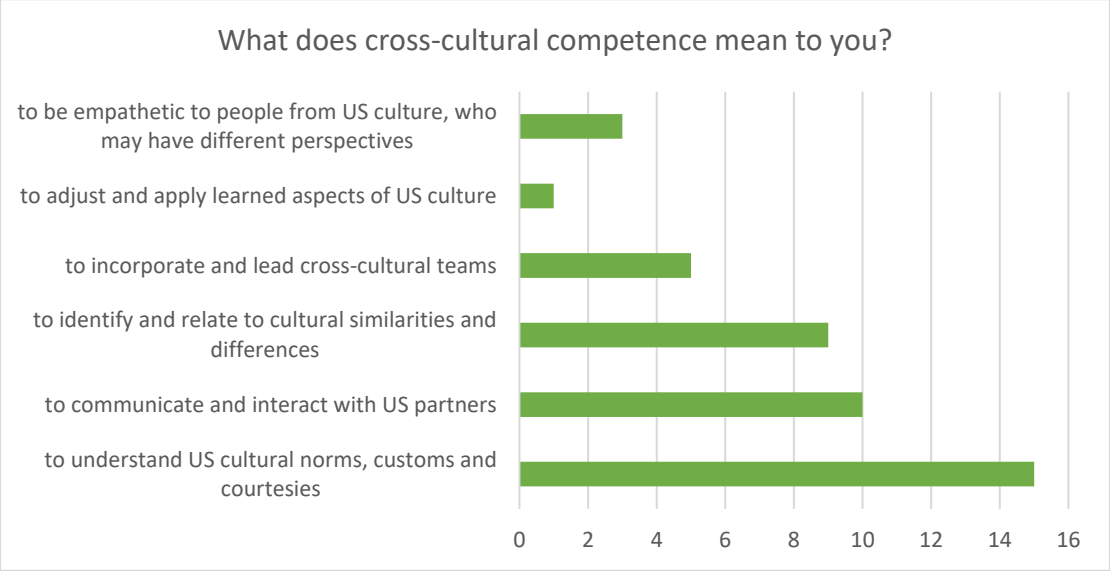

Figure 36: Q6 Cross-Cultural Competence Meaning

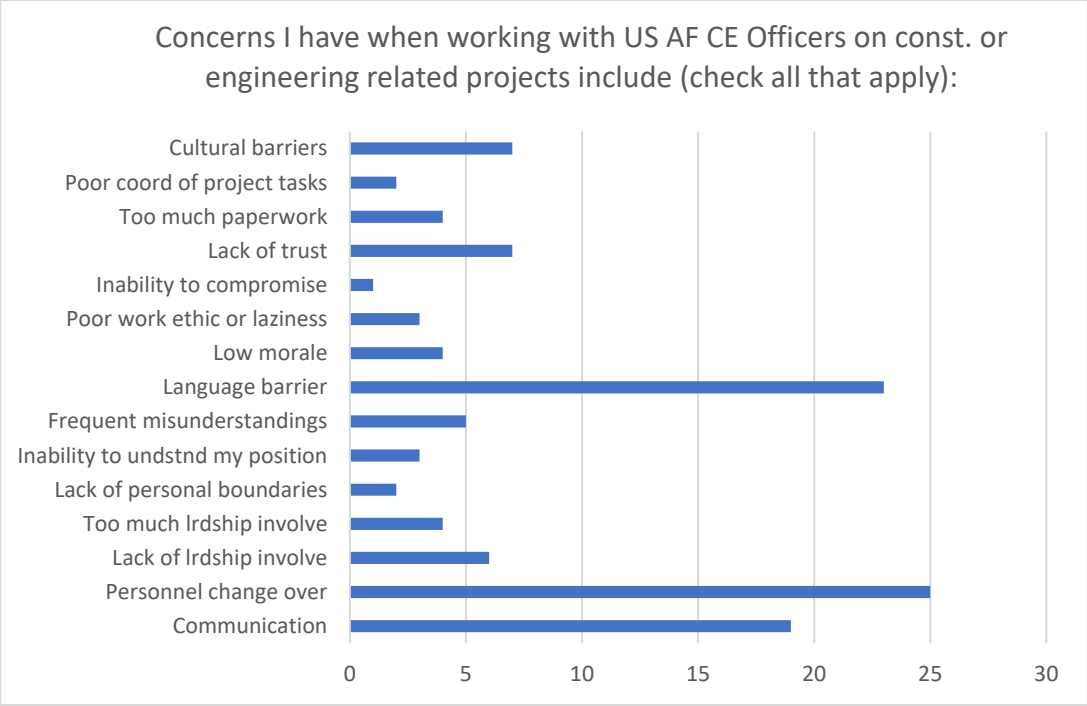

Figure 37: Q7 Concerns when Working on US AF Construction and Engineering Tasks

Communication and language barrier were listed as common obstacles with personnel change over as the most commonly noted. Additional answers included having "less responsibilities and/or understanding of the tasks because of such short period of the position" which is related to the frequency of changeover.

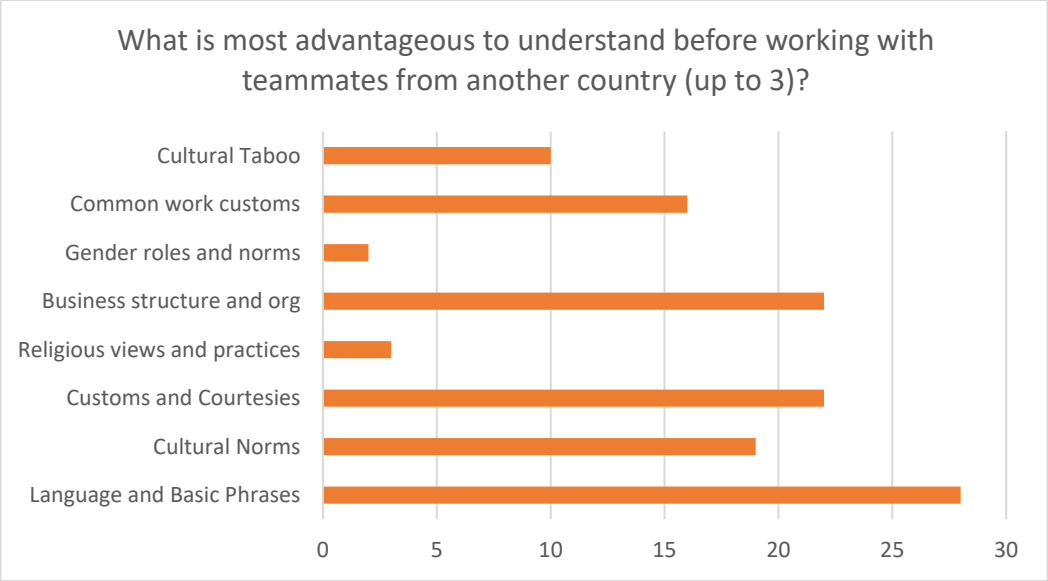

Figure 38: Q8 Most Advantageous 3C Knowledge

Language and basic phrases are something CE Officers are not required to know before working overseas but was of high importance to the local nationals in this study. Gender roles and religious views were not chosen near as often, but these items are frequently found in the current Air Force 3C training and curriculum.

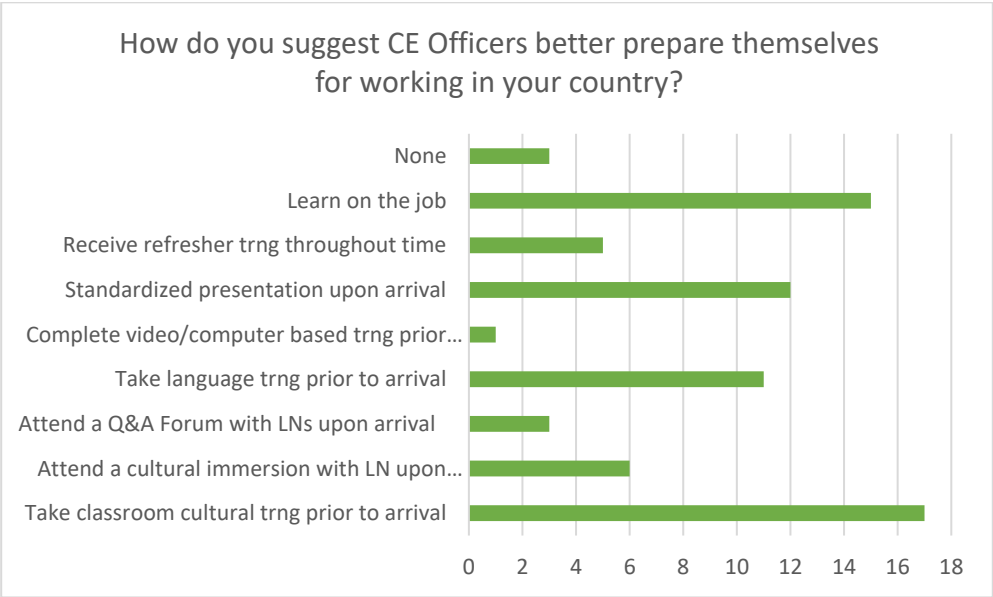

Figure 39: Q9 How to Better Prepare for Working Overseas

For most bases, the standardized presentation is given upon in processing which ranked third in this question. First choice for most effective training chosen by both CE Officers and LNs was classroom training. Language training also ranked high.

Section II Data Analysis and Results

Section two of the survey asked members to rate statements on a seven-point Likert Scale. The statements aimed to measure seven areas of interest in regards to LNs perception of AF CE Officers they had worked with: alignment of culture and values, teamwork, comradery, resource availability, cross-cultural competence, knowledge of local construction and work practices, and team communication. The dependent variable was construction project success and was measured using four questions related to project performance and proper resource allocation. The total number of questions used as shown below was 42. There were four multiple choice questions also asked in relation to these topic areas and the results of these are included within the measures asked below.

1 = *strongly disagree*	2 = *disagree*	3 = slightly *disagree*	4 = *undecided or not applicable*	5 = slightly agree	6 = *agree*	7 = *strongly agree*

DV Measures

25. The resources provided to AF CE teams support the delivery of superior quality work
22. There is enough time allotted to property plan for US military construction projects

23. AF CE computer programs provide adequate support for project success
40. When working on AF CE Projects with the military, I'm often confused on project goals and objectives

Culture/Values

1. The work ethic of AF CE Officers is like my own
39. I find that my values and those of AF CE Officers are alike
3. I find most disagreements, when working with AF CE Officers, stem from a difference in culture and values
24. When working with AF CE Officers, I feel we have different motivations for doing a job well
5. When working on projects with AF CE Officers, my religious views and practices are respected
6. Cultural differences interfere with my ability to do my job with the AF CE Officers
19. AF CE Officers have a proper work-family balance
20. When working on projects with AF CE Officers, the work hours are acceptable
9. I value friendship with my AF CE Officer co-workers

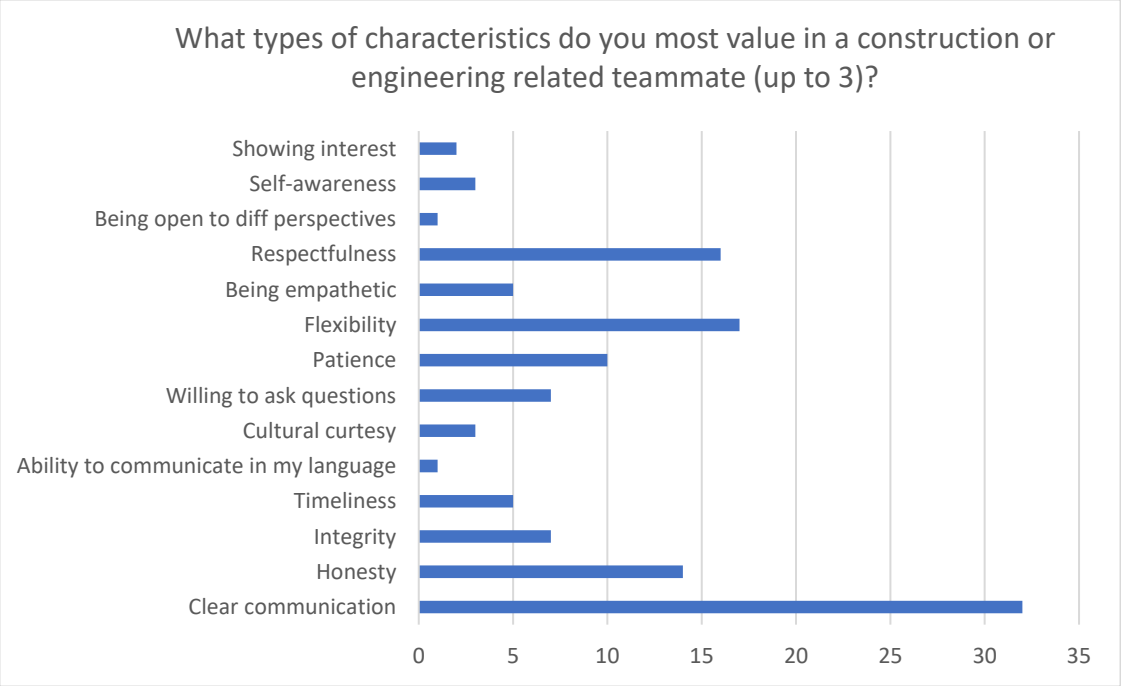

Figure 40: Q10 Characteristics Most Valued in a Work Teammate

Figure 40 highlights the characteristics the local nationals value most in work teams. Clear communication was ranked very high and 80% of participants listed it as one of their top three choices.

Teamwork

10. The cross-cultural military engineer and construction teams I have been on functioned well
11. AF CE Officers in my work group do their fair share
12. The AF CE Officers I have worked with look out for the personal welfare of all group members
13. I feel a part of the team when working with US Military Civil Engineers
16. When working on teams with AF CE Officers, there are rarely conflicts about task responsibilities
2. Safety is neglected by AF CE Officers when on construction worksite

Comradery

4. I enjoy working with AF CE Officers
17. I value comradery with my AF CE Officer co-workers
18. I enjoy learning about US culture from my US counterparts

Resources

21. AF CE Officers eliminate unnecessary activities to improve efficiency of projects
33. AF CE Officers waste organizational resources
26. When working on US military construction, members often disagree about resource allocation

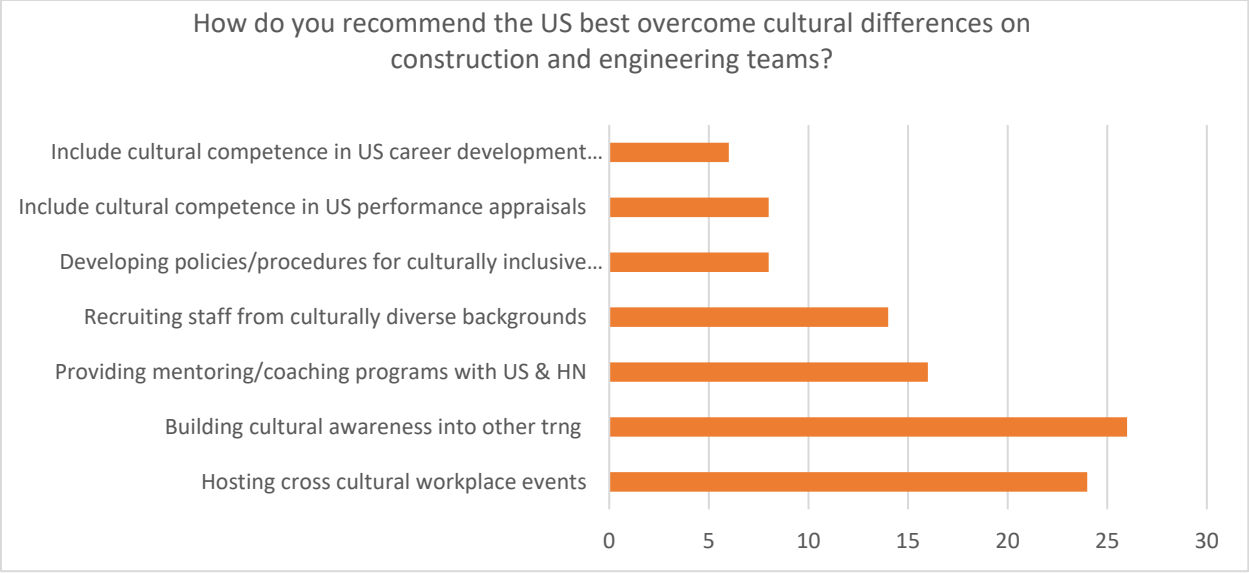

Figure 41: Q12 Recommendations for US to Overcome 3C Barriers in the Workplace

For CE Officers and leadership, host nation respondents feel that adding cultural awareness into other squadron training aspects and hosting cross cultural workplace events are good ways to overcome the cultural differences.

Cross-cultural competence

27. The US AF provides adequate *culture-related* training for my CE Officer teammates
31. Culture plays a large role when working on US Military construction projects
15. Cultural training should be mandatory for AF CE Officers who work on overseas bases
*Note: Question 15 was not included in data set
28. Cultural competence is important when working in cross-cultural teams
29. AF CE Officers integrate diverse viewpoints
30. When working with AF CE Officers, they value my contribution
32. AF CE Officers welcome change and view it as healthy and non-threatening

Knowledge of local construction/work practices

34. AF CE Officers seem to understand local materials availability and the transportation chain
35. AF CE Officers have clear objectives that align with local practices
14. AF CE Officers should be knowledgeable on local construction practices and standards

Team Communication

36. AF CE Officers listen to all members of the team
37. Language differences interfere with the ability to do my job with AF CE Officers
38. I often receive conflicting requests from two or more people during US AF Military construction
40. When working on AF CE Projects with the military, I'm often confused on project goals and objectives
7. I am comfortable discussing project issues and finding solutions with AF CE Officers
8. AF CE Officers keep me informed about plans that affect projects or my work

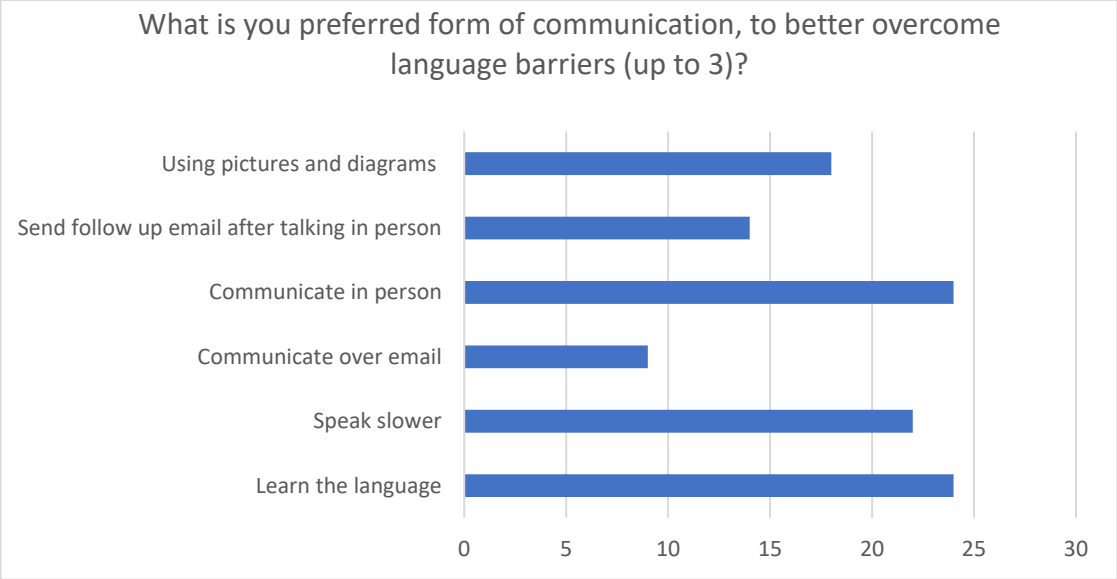

Figure 42: Q11 Preferred Communication Methods

The preferred communication method had mixed responses and most answers ranked high. CE Officers are not required to take language courses of any type prior to overseas assignments but especially amongst the Japanese in this survey, communication and language was a large obstacle for coordinating and executing construction.

Analysis of Data

First, a multivariate analysis was done to determine the Cronbach's α, which is a measure of internal consistency or reliability among measures. If alpha was above .6 it was determined that the questions correlated high enough to be a reliable measurement of the independent variable (IV). The dependent variable (DV) to be measured was project performance. The test of all the questions within an IV or DV were analyzed using the program JMP.

Table 3 shows the relative measures of variability for all the sets of questions. Those that were asked negatively were reverse coded for evaluation. Resources had a low Cronbach's α value but was still included in the analyzed data set. Question 15 and Quesiton 18 were removed as it was determined they were not a valid measure of 3C due to improper and confusing wording. Question 14 "AF CE Officers should be knowledgeable on local construction practices and standards" was reverse coded because the term "should be" did not correlate with the two other questions in the group which asked if AF CE Officers "are" knowledgeable. This demonstrated that while many thought officers should be knowledgeable on local construction practices, most LN's felt that officers were not.

Table 3: Cronbach's Alpha for each IV and DV

Variable	Number Q's Included	Cronbach's α	Q's Removed
DV – Project Performance	4	.6822	0
IV – Similar Culture/Values	9	.6092	0
IV- Teamwork	6	.8091	0
IV - Comradery	3	.6807	0
IV - Resources	3	.5406	0
IV – Cross-Cultural Competence	6	.6650	2 (#15 & #18)

IV – Knowledge of local work practices	3	.6124	0
IV - Communication	6	.5907	0

Each question in the IV and DV subsets were aggregated by taking the mean of all the values. A multivariate analysis produced the correlations and correlation probabilities tables below and the scatterplot matrix in Figure 43.

Table 4: Correlation Values of all IVs and DV

	Culture/ Values	Comradery	Performance	3C	Teamwork	Knowledge	Communication	Resources
Culture/Values	*0.6092*							
Comradery	**0.5286**	*0.6807*						
Performance	**0.4240**	**0.4279**	*0.6822*					
3C	**0.5655**	**0.6513**	**0.6372**	*0.6650*				
Teamwork	**0.6249**	**0.5303**	**0.3795**	**0.6469**	*0.8091*			
Knowledge	**0.1918**	**0.2988**	**0.3194**	**0.5073**	**0.4392**	*0.6124*		
Communication	**0.5066**	**0.5693**	**0.5258**	**0.7234**	**0.3727**	**0.2556**	*0.5907*	
Resources	**0.5222**	**0.4429**	**0.6041**	**0.7045**	**0.4715**	**0.4259**	**0.5586**	*0.5406*

Table 5: Correlation Probabilities for all IVs and DV

	Culture/ Values	Comradery	Performance	3C	Teamwork	Knowledge	Communication	Resource
Culture/Values	**<.0001**							
Comradery	**.0003**	**<.0001**						
Performance	**.0046**	**.0042**	**<.0001**					
3C	**<.0001**	**<.0001**	**<.0001**	**<.0001**				
Teamwork	**<.0001**	**.0003**	**.0121**	**<.0001**	**<.0001**			
Knowledge	**.2178**	**.0516**	**.0368**	**.0005**	**0.0032**	**<.0001**		
Communication	**.0005**	**<.0001**	**.0003**	**<.0001**	**0.0138**	**0.0981**	**<.0001**	
Resources	**.0003**	**.0029**	**<.0001**	**<.0001**	**0.0014**	**0.0044**	**<.0001**	**<.0001**

The DV, project performance, significantly correlated with all the IVs (culture and values, comradery, 3C, teamwork, knowledge of local work customs, communication and resources). Three IV's did not correlate significantly with the IV knowledge of work customs: culture and values, comradery and communication. The scatterbox matrix below gives a visual of the correlations and distributions of data.

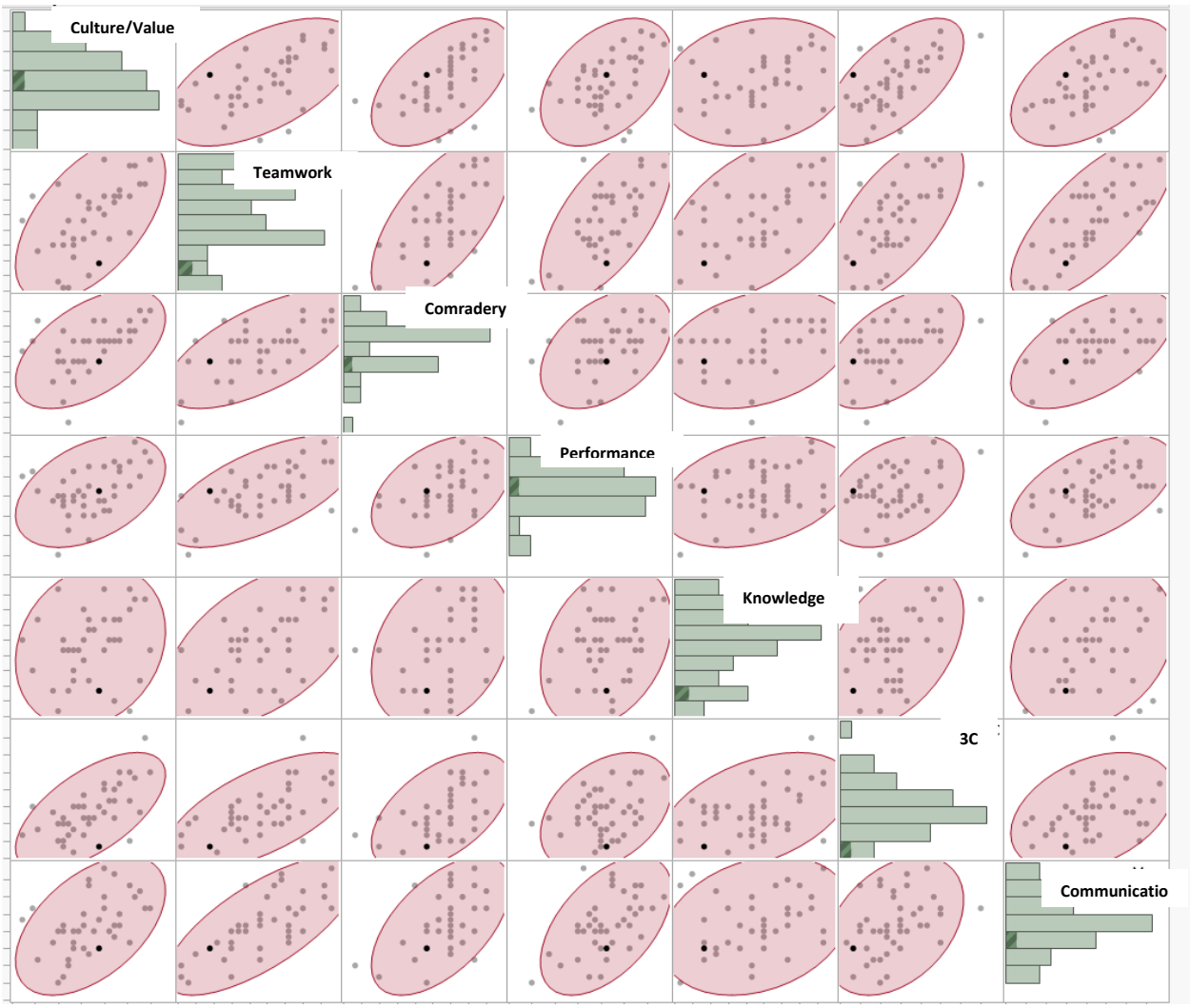

Figure 43: Scatterplot Matrix of Correlations between all IVs and DV

Alternative Hypothesis Testing

Several of the above measures were then tested for differences due to country the participant was from, type of tour and host nation partners job position. The specific tests run were based on the hypothesis made in Chapter 1. Because the effect size was low when breaking the 42 participants into groups based on location, job position and tour type, a normal distribution could not be assumed and therefore non-parametric tests were

used as described in the methods. The null hypothesis, H_o, for each of the nine alternative hypothesis is that there is no difference between the means.

Location

The following three alternative hypothesis (H_a) in Table 6 investigated using the Kruskal-Wallis nonparametric test predicted that there will be a difference in the means of IV's culture and values, knowledge of local construction practices and communication based on location.

Table 6. Non-Parametric Testing Results for Location

IV	ChiSquare	DF	Prob>ChiSq	Results
Communication	**9.2655**	**3**	**0.0260**	Reject the null, accept alternative
	Level	**Count**	**Score Mean**	**Deviation**
	Germany	8	30.1250	2.020
	Japan	31	18.6935	-2.771
	Korea	2	23.7500	.0174
	Turkey	2	39.0000	1.938
Culture/Values	**5.1150**	**3**	**0.1636**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Germany	8	26.3125	1.063
	Japan	31	20.1129	-1.574
	Korea	2	18.0000	-0.433
	Turkey	2	38.0000	1.820
Knowledge	**1.5754**	**3**	**0.6650**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Germany	8	26.8125	1.194
	Japan	31	21.1452	-0.709
	Korea	2	18.5000	-0.377
	Turkey	2	19.5000	-0.261

Given the Chi Squared value and the degrees of freedom (number of responses minus 1), the p value can be found using tables or software. The results show that the answer given within the communication portion of the survey varied significantly based

on the location. Specifically, the deviation for Japan is notably different than Germany and Turkey. Korea and Japan answered differently but not as large of a difference as with the other countries. Although not significant, culture and values measures had a generally low p value with the Asian countries tending to be different from Germany and Turkey. Had the sample size been larger, this measure likely would have resulted in a significant difference. Knowledge of local construction practices did not deviate much from country to country showing that this measure was rated similarly at all overseas bases sampled.

Tour Type

The following three alternative hypothesis (H_a) in Table 7 investigated using the Kruskal-Wallis nonparametric test predicted that there is a difference in means of IV's knowledge of local construction factors, communication and comradery based on tour type and length.

Table 7: Non-Parametric Testing Results for Tour Type

IV	ChiSquare	DF	Prob>ChiSq	Results
Communication	**2.4749**	**1**	**0.1157**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Long Tour	39	21.0385	-1.552
	Short Tour	4	31.3750	1.552
Comradery	**3.2105**	**1**	**0.0732**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Long Tour	39	20.9231	-1.770
	Short Tour	4	32.5000	1.770
Knowledge	**.2553**	**1**	**0.6134**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Long Tour	39	22.3077	-0.484
	Short Tour	4	19.000	0.484

The results show that the answers given within the communication and comradery portions of the survey varied moderately depending on the tour type. Comradery for short tours had a higher overall mean score, which shows that this measure may be a higher determinate of project success for these types of tours. Had the sample size been larger, this measure likely would have resulted in a significant difference and deployment locations could have been included. Knowledge of local construction practices did not deviate much from tour to tour showing that this measure was rated similarly at all overseas bases sampled.

Job Position

The following three alternative hypothesis' (H_a) in Table 8 investigated using the Kruskal-Wallis nonparametric test predicted that there is be a difference in means of IV's communication, comradery and teamwork based on job held by host nation members.

Table 8: Non-Parametric Testing Results for Host Nation Job

IV	ChiSquare	DF	Prob>ChiSq	Results
Communication	**5.2330**	**3**	**0.1555**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Military (Non-US)	1	18.5000	-0.243
	Contractor	6	14.4167	-1.583
	Civilian	11	18.3636	-1.103
	LN Workforce	25	25.5600	2.186
Comradery	**5.8917**	**3**	**0.1170**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Military (Non-US)	1	39.0000	1.357
	Contractor	6	14.8333	-1.520
	Civilian	11	18.5455	-1.065

	LN Workforce	25	24.5600	1.595
Teamwork	**5.0922**	**3**	**0.1652**	Fail to reject null hypothesis
	Level	**Count**	**Score Mean**	**Deviation**
	Military (Non-US)	1	16.000	-0.445
	Contractor	6	11.9167	-2.112
	Civilian	11	22.5455	0.154
	LN Workforce	25	24.4200	1.484

The results show that none of the measures looked at vary significantly based on the respondent's job position but they all have moderate probabilities and given a larger sample size, they may have been significant. For communication, the LN workforce answered much differently than the others. This makes sense because all the LN hires were from Japan and this measure was significant for that location. For comradery, contractors and civilians answered much differently than military and LNs. This may be because contractors and civilians generally work alongside the military and aren't necessarily included in the comradery type events that the LN workforce and military members who may work directly for a CE Officer would see. Teamwork varied moderately between the LN workforce and contractors probably for these same reasons.

V. CONCLUSION

Overall Research Questions

The first study of this thesis, a survey given to AF CE Officers, aimed to answer the following questions:

1. What cultural training are AF CE Officers receiving prior to and upon arrival at an overseas assignment and is this adequate to meet their job duties?
2. What are common overseas construction challenges related to culture that AF CE Officers commonly face?
3. What are successful cultural training practices, should these practices be used by the military, and what does research tell us about successful learning methods?
4. How do industry and other DoD or military branches handle cultural training?

The second survey of this thesis, given to LNs, foreign military members and host nation partners, aimed to answer the following questions:

1. What are common issues when working with AF CE Officers on construction and engineering projects in their country?
2. Where is there a lack of cultural and construction knowledge in AF CE Officers?
3. How can AF CE Officers work more effectively with our counterparts on construction and engineering teams in foreign countries?
4. How can AF CE Officers better prepare and train for working on cross-

cultural teams at overseas locations?

Summary of Survey I Results

There were 38 active duty AF CE Officers that took the multiple-choice voluntary survey comprising of 32 questions. The respondents had a wide range of experience to speak from and 35% had been assigned all three types of tours in their careers. On average, 25% of CE Officers received no training prior to going overseas and of those that did receive training, 40% felt it was inadequate for their job duties. Most of the training received by CE officers currently is via CBT, but they wish they received more classroom training. Overall, the study showed that there were adequate training programs within the DoD and universities but the current 3C program for CE officers should be re-aligned to meet demands of not only deployments but also short and long tours. It was also found that no matter how many times a member had taken a cultural CBT, they had to re-take the same one for the next assignment, not allowing them to gain new knowledge. Perhaps the AF should consider tiering their training approaches. This would allow more experienced Officers the chance to continually grow and learn throughout their career.

The study found that 5% of members reported spending 31 hours or more weekly interacting with host nation counterparts at their deployed base. For long tours this number was much greater at 60% and for short tours, 57%. Deploying Officers all received some sort of cultural training while 15-25% of short and long tour officers received none. Members at deployed locations generally interacted with local nations less often and reported more often that the 3C training they received was adequate for their

duties. Long and short tour Officers interact more but reported less often that their 3C training was adequate. It could be argued that the cross-cultural relationships built on long tours are more significant since the member will be operating in that area for 2-3 years as opposed to 6 months. There were a wide range of comments as to what the exact requirements for cultural training should be. 68% of the respondents believed training should be mandatory for all AF CE Officers and of those, 71% thought it would be best right before departing to an overseas base. The Air Force should take a closer look at the 3C training requirements for all overseas tour types as it appears that they have focused on deployments heavily. Also, while 60% of officers found the received cultural training as adequate to meet their job duties, they preferred classroom training, question and answer forums, and immersions over the most commonly given CBT's.

Amongst many other obstacles noted in the survey by CE Officers, the following were most highly chosen:

- Procurement of land
- Coordination with local authorities
- Miscommunication due to language and culture
- NEPA or environmental standards
- Differences in construction practices
- Differences in building materials
- Presence of poor work ethic and apathy
- Informal or unknown processes

Officers also noted that respectfulness and being open to different perspectives were important 3C skills. They believed that cultural norms, customs and courtesies and host nation partner work customs were the most important knowledge categories to learn before going overseas. The data collected can be used to build a much needed suitable 3C training program for AF CE Officers. The following suggested training programs and courses in Figure 44 were listed by members who took the survey. These are great starting points when looking at successful training practices that already exist. Further investigation of this topic could test various programs to better understand which suited for CE Officers.

Have you seen successful training practices implemented in other DoD or non DoD organizations?

"The University of Washington has a construction management lesson talking about foreign issues/challenges - great material"

"CST with army with cultural training sceneries on site with actors" – 3 additional members commented similarly

"successful training at Combat Durian Training, Ft. Riley KS"

"Middle Eastern Orientation Course (MEOC) and JEOC"

"PRT training, Camp Atterbury (USACE)"

"Upon arrival in Iraq to work with 42nd IO reconstruction cell, they have week of cultural training which was good"

"2 week advisor course which focused on cultural partnering"

"Cultural Communication Course at the Joint Special Ops University at Hurlburt Field, FL"

Figure 44: Successful Training Practices Comments from Survey I

Based on the literature, general cultural sensitivity training and preparation aimed at reducing individuals' uncertainty avoidance could be offered to members to ease transitions into any new culture but especially during the early stages of new team formation. This is a good practice no matter where officers are going because they are

almost always integrated into teams. The next section will summarize host nation members perspective on these topics

Summary of Survey II Results

A total of 42 participants from four countries completed Survey II. Nearly half the participants had 20+ years of experience working on AF construction and engineering projects. In general, host nation partners spend more time on cultural and language training and feel that their training is successful in helping them do their engineering and construction-related tasks on AF projects. All those that did not receive training wish they had.

Amongst many other obstacles noted in the survey by host nation personnel, the following were most highly chosen:

- Frequent turnover
- Miscommunication of requirements
- Slow approvals by both the US and the host nation
- Last minute design changes
- Differing design standards
- Contracting issues
- Miscommunication due to language and culture
- Language Barrier

The local national participants also noted that clear communication, flexibility, honesty and respectfulness were all highly valued attributes in CE Officers. They

believed that language and basic phrase, customs and courtesies, business structure and organization, cultural norms and common work customs were most important knowledge categories for Officers to learn before working overseas in their country. They suggested that CE Officers become culturally competent though classroom training, language training, standard presentations and OJT. LNs thought hosting cross cultural workplace events and building cultural awareness into other work training events would best help team members overcome cultural differences. The preferred communication method by LNs had mixed responses and most answers ranked high. CE Officers should understand from this question that culture does not necessarily depict a person's preferred communication method and that this should be a discussion Officers have with their team members during team formation. CE Officers are not required to take language courses of any type prior to overseas assignments but especially amongst the Japanese in this survey, communication and language was chosen as a large obstacle for coordinating and executing construction with a strong emphasis in language training.

Section two of the survey asked members to rate statements on a seven-point Likert Scale. The statements aimed to measure seven cultural measures related to LNs perception of military construction projects and the AF CE Officers they had worked with. The dependent variable, project performance, significantly correlated with all the independent variables (Culture/Values, Comradery, 3C, Teamwork, Knowledge of local work customs, Communication and Resources). Three IVs did not correlate significantly with the IV Knowledge of local work customs: culture and values, comradery and communication. When preparing a successful 3C training program, all the IVs in this study should be considered since they were positively correlated to project performance.

Based on the non-parametric test results, the topic of communication should be location specific because there was a significant difference in the means based on the country from which the survey participant was from. Culture and values varied moderately by location as well, which is expected based on the many cultural taxonomies discussed in the literature review. The need for officers to have knowledge of local construction practices was universal across locations but this topic is still very location specific based on material availability, design standards and environmental codes. There could be a difference in the type of training needed for long and short tours based on the non-parametric test. Comradery and communication both had low p values but further participation in the survey would allow for more definitive results to include data on deployment locations. The last set of hypothesis tested differences in the means of three measures based on job position held by the survey participant. There were no significant differences in communication, comradery and teamwork but given a larger sample size there may have been. AF CE Officers will work with many different people when coordinating construction and may need different 3C tools and information for each. It is not surprising that contractors whom CE Officers only generally communicate with out in the field answered much differently than LN workforce employees who may work directly under an officer.

Communication and language were often chosen as a large obstacle for coordinating and executing construction. Clear communication was a common response and 80% of participants listed it as one of their top three most valued characteristics for those they work with. CE Officers currently are not required to take language courses of any type prior to overseas assignments. Based on the results, language training should be

considered for CE Officers going to certain countries, such as Japan. Emphasizing communication skills and language training appears that it would help in CE Officers with their 3C abilities and lead to more project success when working with host nation counterparts. It should also be noted that ample opportunities should be provided for personal interaction and socio-emotional bonding to help aid in team formation. These can include social and teambuilding activities such as sports, group lunches and mentorship sessions.

Significance of Research

There are many ways to better prepare CE Officers for overseas tours and to have higher project success in these unique locations. By simply asking host nation personnel their opinion, the military has already become more knowledgeable on understanding why some construction aspects are unsuccessful. Opening communication channels rather than assuming will aid AF CE Officers in better understanding the host nations view and will enable the two groups to better work together.

There are several times in which culture could be introduced into the education requirements for CE Officers. The following are the most notable:

- During AF commissioning program (ROTC, Academy, etc.)
- During the Introduction to CE 101 Course
- During Squadron Officer School
- Prior to any overseas assignment
- As part of other CE Schoolhouse courses

One overall recommendation for the military based on the issues and concerns brought up in this survey is process improvement. The application of innovative improvement strategies will be required for the US AF to maintain air superiority while also working in an increasingly complex environment with reduced defense budgets (Slack, 1999). The idea of Lean Process Improvement could aid in reducing redundant and time-consuming tasks that lead to some of the common obstacles mentioned in this study. These include construction approvals, contracting award processes, and continuity. For example, there are many ways to address the concern of frequent personnel turnover. Continuity and change over for CE Officers is not always a well set up or documented process. Officers often fill non-officer positions and sometimes do not have any access to job specific training prior to taking on the job tasks. This can put pressure and additional tasks on the rest of the team. One way to alleviate this would be to have better change over and continuity processes in place. Another would be to lengthen overseas tour duration to 3 or 4 years so that members do not move as often causing these gaps. Some processes, such as procuring land in foreign countries, are dependent on the local codes and guidelines, but the AF can do its due diligence by showing respect, understand the local customs in courtesies and clearly communicating their processes.

While this study did not conclude that one method of training will be more successful than another, it does outline many available training programs and resources that could address the AF CE 3C training gap. By acknowledging the issues and concerns and going to the root of the problem, the Air Force can address cultural concerns that impact their mission overseas. Working with foreign partners in the CE Officer world will not be going away anytime soon. Cultural differences can be a true impedance to

productivity but there are ways for CE officers to become more cross-culturally competent through meaningful training. Successfully working with host nation partners at overseas bases will create stronger relationships and alliances leading to the completion of more construction project on time and within budget.

Table 9 depicts the most common trends and topics that come up on both Survey I, the CE Officer perspective and Survey II, host nation perspective's which can be incorporate into 3C curriculum for CE Officers in the future.

Table 9: Common trends in data throughout both survey I and Survey II

Frequent Turnover and Continuity between Officers
Overcoming miscommunication in language and culture
Differing design standards and construction practices
Slow approvals by the US and HN
Understanding of cultural norms, customs and courtesies
Understanding customs and courtesies of HN
Understanding local work customs and materials
Learning on the job
Learning cultural norms
Taking classroom training prior to arriving on station
Being respectful
Including location specific communication training

Recommended Future Research

This study opens up many areas of continuing research options. Follow on research opportunities for 3C include broadening or narrowing of the research topic. Specifically, surveys and research could be expanded to other career fields in the AF or the DoD to better understand how working with different cultures changes job knowledge requirements. The research could also be narrowed to CE Officers who work in a specific world region, tour type, rank or by job duty. Lastly, based on the results of this study and the previous Delphi study, a trial training program or programs could be tested. The Air

Force Culture and Language Center (AFCLC) may also have research related to this that would help them implement Air Force LREC capabilities.

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Appendix I: Copy of Survey I and II

Survey 1: Air Force CE Cultural Training Survey

Rank: Gender: M / F AFSC:

Short Tour Locations: Long Tours Locations: Deployment Locations:

For your most recent OS assignment, please answer the following questions:

☐ Short Tour ☐ Long Tour ☐ Deployment Location: _____

1a. List primary position(s):

1b. Number of hours interacted weekly with foreign nationals due to job requirements:

☐ 1-5 hours ☐ 6-15 hours ☐ 16-30 hours ☐ 31+ hours

☐ none ☐ Other:_____

1c. Method of cultural or language training given (check all that apply)?

☐ CBT ☐ Classroom Training ☐ On the job training ☐ List of resources

☐ Sponsorship Program ☐ Standard Presentation ☐ QA Forum with Local Nationals ☐ During turnover with predecessor

☐ Video ☐ Post arrival immersion ☐ None ☐ Other:_____

1d. Number of hours spent on training? (if multiple methods, choose total time)

☐ 30 minutes or less ☐ 30 min-2 hours ☐ 2-5 hours ☐ 5-10 hours

☐ 10-30 hours ☐ 30+ hours ☐ N/A ☐ Other:_____

1e. Was this training method adequate for your job duties?

☐ Yes ☐ No ☐ Other: _____

1f. Which method of training do you wish you received more of (check all that apply)?

☐ CBT ☐ Classroom Training ☐ On the job training ☐ List of resources

☐ Sponsorship Program ☐ Standard Presentation ☐ QA Forum with Local Nationals ☐ Video

☐ None ☐ During turnover with predecessor ☐ Post arrival immersion ☐ Other:_____

Comments:

For your second most recent OS assignment, please answer the following questions:

☐ Short Tour ☐ Long Tour ☐ Deployment Location: _____

2a. List primary position(s):

1b. Number of hours interacted weekly with foreign nationals due to job requirements:

☐ 1-5 hours ☐ 6-15 hours ☐ 16-30 hours ☐ 31+ hours
☐ none ☐ Other:_____

2c. Method of cultural or language training given (check all that apply)?

☐ CBT ☐ Classroom Training ☐ On the job training ☐ List of resources
☐ Sponsorship Program ☐ Standard Presentation ☐ QA Forum with Local Nationals ☐ Video
☐ None ☐ During turnover with predecessor ☐ Post arrival immersion ☐ Other:_____

2d. Number of hours spent on training? (if multiple methods, choose total time)

☐ 30 minutes or less ☐ 30 min-2 hours ☐ 2-5 hours ☐ 5-10 hours
☐ 10-30 hours ☐ 30+ hours ☐ N/A ☐ Other:_____

2e. Was this training method adequate for your job duties?

☐ Yes ☐ No ☐ Other: _____

2f. Which method of training do you wish you received more of (check all that apply)?

☐ CBT ☐ Classroom Training ☐ On the job training ☐ List of resources
☐ Sponsorship Program ☐ Standard Presentation ☐ QA Forum with Local Nationals ☐ Video
☐ None ☐ During turnover with predecessor ☐ Post arrival immersion ☑ Other:_____

Comments:

General Questions

3a. What does cross-cultural competence (3C) mean to you (check up to 2)?

☐ to understand cultural norms, customs & courtesies ☐ to communicate and interact with foreign partners and locals ☐ to identify and relate to cultural similarities and differences ☐ to incorporate and lead cross-cultural teams

- ☐ to adjust and apply learned aspects of a foreign culture
- ☐ to be empathetic to people from another cultures that have different perspectives
- ☐ Other: _____ _____

3b. What are the key factors that make up cross-cultural competence, and culturally acceptable skills and behaviors (choose up to 3 and rank, #1 being most important)?

- ☐ Willing to ask questions
- ☐ Patience
- ☐ Respectfulness
- ☐ Being empathetic
- ☐ Honesty
- ☐ Flexibility
- ☐ Being open to different perspectives
- ☐ Self-awareness
- ☐ Showing interest
- ☐ Other: _____

3c. What is most advantageous to know and understand before working on a cross cultural construction team (choose up to 3 and rank, #1 being most important):

- ☐ Language and Basic Phrases
- ☐ Cultural Norms
- ☐ Customs and Courtesies
- ☐ Religion
- ☐ Business structure and organization
- ☐ Gender roles and norms
- ☐ Host Nation Work Customs
- ☐ Cultural Taboo
- ☐ Other:_____

3d. When do you think it's best to learn about the host nation culture and working in cross cultural teams?

- ☐ At CE 101
- ☐ Before departing to OS assignment
- ☐ At new OS assignment location
- ☐ During undergrad degree
- ☐ Other: _____

3e. What are the largest obstacles when doing construction and civil engineering in OS locations (choose up to 3 and rank, #1 being most important)?

- ☐ Loss of trust from Host Nation due to US predecessors
- ☐ Host Nation approval boards only met once a quarter, year, etc
- ☐ Projects had to re-compete for funding due to delay of Host Nation approval
- ☐ Badging for base projects caused issues
- ☐ Multiple overarching entities and sub-entities to coordinate for approval
- ☐ Procurement of land issues
- ☐ Relying on Host Nation counterparts to process requests
- ☐ Miscommunications due to language and cultural barriers
- ☐ Gate and base access
- ☐ Contracting and payment issues
- ☐ Contractors unfamiliar with US
- ☐ Fluctuations in USD$ value

base standard practices and requirements

- ☐ Designs were altered or refined to meet the Host Nation vision
- ☐ Host Nation's equivalent of NEPA
- ☐ Coordination with local authorities off base
- ☐ Other: _____

3f. What are the largest ***cultural*** obstacles when doing construction and civil engineering in OS locations (choose up to 3 and rank, #1 being most important)?

- ☐ Always in competition with Host Nation for laborers and craftsmen
- ☐ Host Nation created their own standards making mx and operations more challenging
- ☐ Clearances, background checks, security (badging process) for base access
- ☐ Host Nation customs office refusal to release equipment/material
- ☐ Presence of poor work ethic and apathy
- ☐ Differences in architectural standards
- ☐ Differences in building materials
- ☐ Differences in safety practices
- ☐ Differences in construction practices
- ☐ Differences in statutory requirements
- ☐ Issues with local council approvals
- ☐ Informal processes & some disregard for written contracts
- ☐ Language barrier without a proper translator present
- ☐ Other: _____

3g. Do you think there should be a requirement for cultural training prior to CE OS assignments?

- ☐ Yes
- ☐ No

Comment:

3h. Have you seen successful training practices implemented in other DoD or non DoD organizations?

- ☐ No
- ☐ Yes

If yes, where?

Comments / Testimonial:

Please add any additional comments here that you would like the researcher to know.

☐ Please check this box to grant us permission to use your answers in an AFIT thesis.

Thank you very much for taking the time to complete this survey. Your feedback is valued and very much appreciated!

Survey 2: Host Nation Perspective

Researcher: Capt Katie MacGregor, AFIT/ENV
Thank you for agreeing to take part in this important survey. This survey should take 15-20 minutes. Be assured that all answers you provide will be kept confidential. The data collected from this survey will be used in an Air Force Institute of Technology thesis related to cultural training and its adequacy for Air Force CE Officers working in overseas locations. Your participation in this research is voluntary and non-attributional. Contact you squadron POC or Capt MacGregor with questions or concerns

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Section I

1. What method of cultural/language training did you receive prior to working with the US Military? (check all that apply)

a. Higher education or degree related training

b. Computer based training

c. Immersion with US Military Members

d. Resource list for self-study

e. Sponsorship program

f. Question and Answer forum with US counterparts

g. Video

h. On the job training

i. Classroom training

j. Standardized briefing or presentation

k. During turnover with predecessor

l. None

m. Other:_____

2. Number of hours of training received?

a. 0-30 min

b. 30 min – 2 hours

c. 2 - 5 hours

d. 5 - 10 hours

e. 10 - 30 hours

f. None

g. Other: _____

3. Was this training adequate for your job duties?

a. Yes

b. No

4. What are the largest challenges in *coordinating* construction on US AF military bases in your country (check up to 3)?

Miscommunication of requirements

Lack of leadership involvement

Too much leadership involvement

Frequent turnover of personnel

Too many requirements and/or paperwork required by US

Too many requirements and/or paperwork required by host nation

Coordination processes not well defined or unknown

Slow approvals by US

Slow approvals by host nation

Unclear documentation or direction from US

Lack of communication from US

Lack of communication from host nation

Computer program issues or access concerns

other _____

5. What are the largest challenges that *delay* construction on US AF military bases in your country (check up to 3)?

Too much leadership involvement

Lack of leadership involvement

Differences in construction practices

Contracting issues

Local material procurement issues

Differences in design standards between US and host nation

Local labor shortage

Procurement of Land issues

Funding issues

Badging or gate access for contractors

Slow approvals by US

Slow approvals by host nation

Miscommunication due to language and/or culture

Fluctuations in USD$ value

Coordination with local municipalities or government

Local contractors unfamiliar with US base standards and procedures

US Environmental Standards

Last minute design changes by US

Loss of trust of US members

other _____

6. What does cross-cultural competence mean to you?

a. to understand US cultural norms, customs and courtesies

b. to communicate and interact with US partners

c. to identify and relate to cultural similarities and differences

d. to incorporate and lead cross-cultural teams

e. to adjust and apply learned aspects of US culture

f. to be empathetic to people from US culture, who may have different perspectives

g. other _____

7. Some of the concerns I have when working with US AF CE Officers on construction or engineering related projects include (check all that apply):

Communication

Constant personnel change over

Lack of leadership involvement

Too much leadership involvement

Lack of personal boundaries

Inability to relate or understand my position

Frequent misunderstandings

Language barrier

Low morale

Poor work ethic or laziness

Inability to compromise

Lack of trust

Too much paperwork

Poor coordination of project tasks

Cultural barriers

other _____

8. What is most advantageous to know and understand before working with teammates from the US or another country (check up to 3)?

a. Language and Basic Phrases

b. Cultural Norms

c. Customs and Courtesies

d. Religious views and practices

e. Business structure and organization

f. Gender roles and norms

g. Common work customs

h. Cultural Taboo

i. Other:_____

9. How do you suggest CE Officers better prepare themselves for working in your country?

a. Take classroom based cultural training prior to arrival

b. Attend a cultural immersion with local nationals upon arrival

c. Attend a Question-Answer Forum with local nationals upon arrival

d. Take Language Training prior to arrival

e. Watch videos and complete computer based training prior to arrival

f. Receive a standardized presentation or briefing upon arrival

g. Receive refresher training throughout their time on station

h. Learn on the job

i. None

j. Other:_____

11. What types of characteristics do you most value in a construction or engineering related teammate (choose up to 3)?

Clear communication

Honesty

Integrity

Timeliness

Ability to communicate in my language

Cultural curtesy

Willing to ask questions

Patience

Flexibility

Being empathetic

Respectfulness

Being open to different perspectives

Self-awareness

Showing interest

Other:_____

13. What is you preferred form of communication, to better overcome language barriers (choose up to 3)?

Learn the language

Speak slower

Communicate over email

Communicate in person

Send follow up email after talking in person

Using pictures and diagrams

Other:_____

14. How do you recommend the US best overcome cultural differences on construction and engineering teams?

Hosting cross cultural workplace events

Building cultural awareness into other training programs

Providing mentoring or coaching programs between the US and host nation workforce

Recruiting more staff from culturally diverse backgrounds

Developing policies and procedures for culturally inclusive work practices

Include cultural competence in US performance appraisals

Include cultural competence in US career development strategies

Other:_____

Section II

1 = *strongly disagree*	2 = *disagree*	3 = *undecided or not applicable*	4 = *agree*	5 = *strongly agree*

Culture/Values

The work ethic of AF CE Officers is similar to my own

1 2 3 4 5 6 7

I find that my values and those of AF CE Officers are alike

1 2 3 4 5 6 7

I find most disagreements, when working with AF CE Officers, stem from a difference in culture and values

1 2 3 4 5 6 7

When working with AF CE Officers, I feel we have different motivations for doing a job well

1 2 3 4 5 6 7

When working on projects with AF CE Officers, my religious views and practices are respected

1 2 3 4 5 6 7

Cultural differences interfere with my ability to do my job with the AF CE Officers

1 2 3 4 5 6 7

AF CE Officers have a proper work-family balance

1 2 3 4 5 6 7

When working on projects with AF CE Officers, the work hours are acceptable

1 2 3 4 5 6 7

I value friendship with my AF CE Officer co-workers

1 2 3 4 5 6 7

Teamwork

The cross-cultural military engineer and construction teams I have been on functioned well

1 2 3 4 5 6 7

AF CE Officers in my work group do their fair share

1 2 3 4 5 6 7

The AF CE Officers I have worked with look out for the personal welfare of all group members

1 2 3 4 5 6 7

I feel a part of the team when working with US Military Civil Engineers

1 2 3 4 5 6 7

When working on teams with AF CE Officers, there are rarely conflicts about task responsibilities

1 2 3 4 5 6 7

Comradery

I enjoy working with AF CE Officers

1 2 3 4 5 6 7

I value comradery with my AF CE Officer co-workers

1 2 3 4 5 6 7

I enjoy learning about US culture from my US counterparts

1 2 3 4 5 6 7

Resources

AF CE Officers eliminate unnecessary activities to improve efficiency of projects

1 2 3 4 5 6 7

AF CE Officers waste organizational resources

1 2 3 4 5 6 7

There is enough time allotted to property plan for US military construction projects

1 2 3 4 5 6 7

AF CE computer programs provide adequate support for project success

1 2 3 4 5 6 7

The resources provided to AF CE teams support the delivery of superior quality work

1 2 3 4 5 6 7

When working on US military construction, members often disagree about resource allocation

1 2 3 4 5 6 7

Cross-cultural competence

The US AF provides adequate *culture-related* training for my CE Officer teammates

1 2 3 4 5 6 7

Culture plays a large role when working on US Military construction projects

1 2 3 4 5 6 7

Cultural training should be mandatory for AF CE Officers who work on overseas bases

1 2 3 4 5 6 7

Cultural competence is important when working in cross-cultural teams

1 2 3 4 5 6 7

AF CE Officers integrate diverse viewpoints

1 2 3 4 5 6 7

When working with AF CE Officers, they value my contribution

1 2 3 4 5 6 7

AF CE Officers welcome change and view it as healthy and non-threatening

1 2 3 4 5 6 7

Knowledge of local construction/work practices

Safety is neglected by AF CE Officers when on construction worksite

1 2 3 4 5 6 7

AF CE Officers seem to understand local materials availability and the transportation chain

1 2 3 4 5 6 7

AF CE Officers have clear objectives that align with local practices

1 2 3 4 5 6 7

AF CE Officers should be knowledgeable on local construction practices and standards

1 2 3 4 5 6 7

Team Communication

AF CE Officers listen to all members of the team

1 2 3 4 5 6 7

Language differences interfere with the ability to do my job with AF CE Officers

1 2 3 4 5 6 7

I often receive conflicting requests from two or more people during US AF Military construction

1 2 3 4 5 6 7

When working on AF CE Projects with the military, I'm often confused on project goals and objectives

1 2 3 4 5 6 7

I am comfortable discussing project issues and finding solutions with AF CE Officers

1 2 3 4 5 6 7

AF CE Officers keep me informed about plans that affect projects or my work

1 2 3 4 5 6 7

Section III

Country: Gender (M/F):

On average, how many hours a week do you interact with CE Officers?

a. 1-5 hours

b. 6-15 hours

c. 16-30 hours

d. 31+ hours

e. None

f. Other:_____

Number of years worked construction or engineering projects on US Military Bases:

0-1 years

1-3 years

3-5 years

5-10 years

10-20 years

20+ years

Others: _____

Position:

Non-US Military

Contractor

Civilian

Local National Workforce

Other: _____

Type of Work:

Degreed Engineer/Engineering Flight

Skilled Laborer/Operations Flight

Host Nation Military Engineer

Host Nation Military Other

Non-US Military

Other: _____

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 074-0188

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1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From – To)*
21-03-2019	Master's Thesis	Sep 2017 - Mar 2019

4. TITLE AND SUBTITLE
Analysis of Cross-Cultural Training Efforts, Competencies and Implications, and how Cross-Cultural Competency Affects the Success of Construction Projects on Air Force Installations Overseas

5a. CONTRACT NUMBER
5b. GRANT NUMBER
5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
MacGregor, Katie L, Capt

5d. PROJECT NUMBER
5e. TASK NUMBER
5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)
Air Force Institute of Technology
Graduate School of Engineering and Management (AFIT/ENV)
2950 Hobson Way, Building 640
WPAFB OH 45433-8865

8. PERFORMING ORGANIZATION REPORT NUMBER
AFIT-ENV-MS-19-M-186

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Intentionally Left Blank

10. SPONSOR/MONITOR'S ACRONYM(S)
11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
DISTRUBTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

13. SUPPLEMENTARY NOTES
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US Air Force (AF) Civil Engineer (CE) Officers stationed overseas lead and manage construction and engineering efforts for projects totaling billions of dollars annually. Budget overruns in the Department of Defense (DoD) have been under stringent investigation in recent years. 92% of CE Officers overseas work with local nationals (LN) weekly or daily, but most receive less than two hours of formal cross-cultural training. Based on a previous Delphi study, 60% of officers received cultural training, the majority of which was Computer Based Training (CBT) or on the job (OJT). Of those that received training, 40% felt it was inadequate to meet their job duties. This second iteration, two survey study aims to better understand where cross cultural competence (3C) gaps lie. The first study was given to CE Officers and the second given to host nation partners. This research investigates the negative impacts on construction project success due to a lack in 3C. The study also includes a review of current practices and available resources. The goal is to inform the AF Language, Regional Expertise and Culture (LREC) training implementation process. The implications of this study help prepare CE Officers, and the alike, to perform duties overseas.

15. SUBJECT TERMS
Cross-cultural, training, civil engineer, overseas, construction, project management

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
					Dr. John J. Elshaw, AFIT/ENV
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER *(Include area code)*
U	U	U	UU	138	(937) 255-6565, x 4650 (john.elshaw@afit.edu)

Standard Form 298 (Rev. 8-98) Prescribed by ANSI Std. Z39-18