

From Geek to Chief – How Prepared is the Army Technical Community for Leadership

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Table of Contents

Table of Contents	ii
List of Figures	iv
Abstract	v
Chapter 1 – Introduction	1
Background.....	1
Problem Statement	2
Purpose of This Study.....	2
Significance of This Research.....	3
Overview of the Research Methodology.....	3
Limitations	3
Chapter 2 – Literature Review.....	5
Chapter 3 – Research Methodology.....	15
Research Question.....	15
Research Design.....	15
Bias and Error	16
Chapter 4 – Findings.....	17
Theme 1 - Desired Competencies for Technical Leaders.....	17
Theme 2 - Leadership Development in the Civilian Workforce.....	21
Chapter 5 – Interpretation	29
Conclusions.....	29
Recommendations	30

Limitations of the Study..... 31

References 32

Glossary of Acronyms and Terms 36

List of Figures

Figure 1 – Skills and Attributes for the Army civilian Pentathlete.....	21
Figure 2 - The Army's Leader Development Model.....	25

Abstract

Civilian Army technical professional early development focuses on technical competencies – knowledge, skills, and abilities needed to accomplish a specific job. This development includes applying general Science, Technology, Engineering, and Mathematics (STEM) principles to the unique Army problem set. Technical personnel who wish to become supervisors and leaders need additional skills to be effective in those positions. Besides STEM skills, non-technical competencies like effective communications and empathy factor into success at the managerial and leadership levels.

This qualitative case study explores the Army's technical workforce's needs to become successful future managers and leaders. It identifies two major themes – the leadership skills and competencies needed to lead a technical organization and the current state of Army civilian leadership.

Chapter 1 – Introduction

Title: From Geek to Chief - How Prepared is the Army Technical Community for Leadership

Background

When most people think of the United States (US) Army, they think of the uniformed soldiers that conduct operational missions such as peacekeeping and warfare. Besides this more visible aspect, the Army also consists of an institutional segment that runs functional missions and is responsible for equipping, training, and deploying a ready operational force. (Army Doctrine Publication (ADP) 1-0 The Army, 2019) Besides soldiers, the Army has a cadre of civilian employees, most of whom are part of the institutional Army. The latest figures show that over 250,000 Department of the Army civilians, around 23% of the total Army personnel, work to support the Army mission. (Defense Manpower Data Center, 2020)

Within this civilian workforce are Science, Technology, Engineering, and Mathematics (STEM) professionals referred to as the Army technical community. The Army manages its civilian workforce using 32 career programs (CP). CP-16, Engineers & Scientists (non-construction), and CP-18, Engineers & Scientists (Resources & Construction), include most of the technical community and comprise 6.84% and 10.33%, respectively, of the civilian workforce. (Richardson & Johnson, 2020)

General James C. McConville became the 40th Chief of Staff of the Army (CSA) in August 2019. In his initial message to the Army Team, he stated, "People are always my #1 priority." (McConville, 2019, p. 1) The 2019 Army Modernization Strategy (2019) identifies three pathways for achieving a new modernized end state. The Leader Development – Talent

Management path focuses on developing the Army workforce. The 2019 Army People Strategy (2019) further articulates this development initiative.

Problem Statement

Army technical professionals' early development focuses on technical competencies – knowledge, skills, and abilities needed to do a specific job. This development includes learning to apply general STEM principles to the unique Army problem set. As these professionals gain experience, they delve deeper into the unique technical challenges and problems that need to be solved. To overcome these technical challenges, Army technical personnel focus their training and skill development in the technical field. As STEM personnel advance within the organization, they often need to take on supervisory and leadership roles that require an additional set of non-technical skills. Technical personnel who do not develop these skills with their technical competencies may find themselves in management or leadership positions before being ready for them.

Purpose of This Study

This qualitative case study will explore the competency needs of the Army's technical workforce who desire to become effective future managers/leaders. It will outline the skills, abilities, and attributes that are needed to manage technical organizations. It will examine the potential gaps in the Army technical community's skillsets and the reasons for those gaps. The study will provide recommendations for potentially closing this gap.

Significance of This Research

Presently the Army is revamping how it manages its personnel, which makes this research significant and timely. The CSA emphasized that people drive the Army's success. The Army People Strategy (2019) describes the "shift from simply "distributing personnel" to more deliberately managing the talents of our Soldiers and Civilians." (p. 2) Building on that strategy, individual commands are developing their local talent management plans. It is an opportune time to evaluate the technical workforce's needs as part of the overall personnel strategy.

Overview of the Research Methodology

This research seeks to understand the current state of leadership skills of the Army's technical workforce. The method will be a qualitative historical case study based on available data from prior research studies, reports, and other published data. This research uses historical cases studies and seeks to answer the following research questions:

1. What are effective leadership skills in the Army?
2. How do non-technical skills (i.e. soft skills) contribute to effective leadership in the Army?
3. What is the current state of leadership skills within the Army's technical community?
4. Why is there a gap between the current state and the desired state of non-technical leadership skills in the Army?

Limitations

Several limitations exist for this research paper. Time constrains the researcher since this paper is part of the Senior Service College Fellowship (SSCF) program, run by the Defense Acquisition University (DAU), and must conclude within ten months. Lack of financial

resources limits the research to existing data. Not having an Independent Review Board (IRB) restricts the use of new studies that involve people. This research will be limited to the Army and focus on STEM personnel to keep the scope manageable

Chapter 2 – Literature Review

Introduction

To address the research questions posed in chapter 1, the researcher conducted a literature review. This review focused on effectual leadership skills, leadership styles, leadership within technical organizations, and the technical workforce within the federal government. The strategy consisted of searching databases using key phrases, screening the results using the abstracts, and downselecting the relevant materials. ProQuest and Google Scholar acquired the results. The literature review focused on studies on the topics, so most of the sources were doctoral dissertations and scholarly journal articles. The literature review restricted the scope to documents written in English while excluding those relating to foreign militaries and governments.

Effective Leadership Skills

This review identified what the literature says about effective leadership skills. Webster University's Management 5670 presented several theories about leadership and identified effective leadership skills and behaviors. What did previous studies identify as crucial skills that successful leaders have? A ProQuest search using the keywords "effective, leadership, and skills" yielded 306,725 results demonstrating that many people have studied this topic. To narrow down the search and see if anyone had explicitly researched the Army community, the term "Army" was added to the first three. This last search yielded 28,277 results.

Natrajan & Chattopadhyay (2014) evaluated the effect of various leadership skills software projects' success, which are considered complex and dynamic. Using results from a

questionnaire of 150 information technology (IT) professionals from five leading IT firms within India, they performed an Analysis of Variance (ANOVA) analysis to determine if there was any statistical difference between different types of leadership behaviors. They binned the behaviors into four main categories: task behaviors, relationship behaviors, change behaviors, and boundary-spanning behaviors. The results of their study showed that the most critical factors for successful software projects are relationship behaviors. These behaviors include such skills as displaying empathy, consulting on decision making, empowering team members, recognizing personnel, and providing coaching and opportunities for skill development. This study's strengths are that it looked at complex project management and had a decent sample size. The study's weaknesses are that it was limited to one country (India) and one technical field (software). This study demonstrated that relationship skills are the most important within complex projects, followed by technical competence.

Clements (2013) evaluated management and leadership skills desired in mid-level managers by senior-level executives in non-profit organizations. Eleven senior-level executives identified four critical management skills and seven essential leadership skills for mid-level managers. The study applied the Delphi method, which included identification, shared evaluation and re-evaluation, and consensus, to determine the list. The seven essential leadership skills could be classified as soft skills and included authenticity, promotion of healthy organizational culture, human capital valuation, responsibility, creating alignment, providing senior-level support, and relationship building. Since non-profits are similar, in some aspects, to government sector employment, this was considered a strength for this source. The study's weaknesses included the small sample size, the limited geographic region (Orange County, California), and not reaching 100% consensus. Despite the shortcomings, this study does

indicate that higher-level executives value soft skills in mid-level managers – at least in the non-profit sector. This study showed that several leadership skills are considered essential for mid-level managers, but there is disagreement about which is most important.

Holmes (2006) studied the leadership effectiveness of junior noncommissioned officers as seen by senior leaders. Two hundred forty-one senior leaders, located world-wide, evaluated the perceived management and leadership skills, knowledge, and attributes of their junior officers. The majority (87.8%) were content with the leadership quality of their junior leaders. The three most important leadership skills identified were people skills, communication, and counseling. The study's strengths were the positive return rate of the survey (100%) and the sample's geographic diversity. A weakness of the survey was its restriction to only the Dental Command.

Holley (2016) identified leaders' need to develop their leadership identity and skills before transitioning to leadership. Using semi-structured interviews of 13 leaders from Dallas/Fort Worth, Texas, the study determined effectual leaders need communication, interpersonal, and problem-solving skills on the first day of the job. A recommendation from the interviews was for organizations to offer leadership training to help cultivate these skills. The small sample size and limited geographic region are weaknesses of the study.

Effective Leadership Styles

Perhaps evaluating leadership style instead of looking at individual leadership skills would be a better indicator of effectiveness. Some leadership styles to consider are servant, transformational, and transactional. Using the terms "servant leadership and army civilian" yielded 42,265 results in ProQuest Dissertations and Theses Global and only 190 in EBSCO

Academic Search Ultimate. Putting the same terms into ProQuest ABI/INFORM Global only resulted in 2122 hits. The restriction of "army civilian" was added to determine if any prior studies looked at the Army technical workforce, ensuring this paper's proposed work does not duplicate efforts.

Nash (2016) examined the correlations between leadership style and job satisfaction at an Internal Revenue Service (IRS) call center in St. Louis, Missouri. The study utilized a quantitative correlational design where 129 IRS employees completed the Multifactor Leadership Questionnaire (MLQ) and the Federal Employee Viewpoint Survey (FEVS). The study showed that a transformational leadership style correlated most strongly and positively with job satisfaction and employee empowerment. These same variables had a negative correlation when employees observed a passive/avoidant leadership style. The strengths of the study were the Federal Government workforce sample population and the larger sample size. Weaknesses included restriction to one agency (IRS) and one location (St. Louis).

Jordan (2015) conducted a quantitative case study to evaluate the relationship between Servant Leadership and job satisfaction within a US Navy organization. The research design was a survey utilizing the Organizational Leadership Assessment and the Minnesota Satisfaction Questionnaire. Data analysis applied a Pearson product-moment correlation and analysis of covariance. The findings indicated a strong positive correlation between servant leadership and job satisfaction. The study's strengths were the larger population size of 220 persons and that the US Navy is a similar organization to the US Army. A weakness of the study was its limited location.

Hargis, Watt, & Piotrowski (2011) examined how leader behaviors change in importance across different criteria and organizational contexts. Using correlation matrices from previously

published studies, the researchers reanalyzed the data using a Dominance Analysis and a Relative Weights Analysis. The data sets chosen had a diverse sample that included both military and healthcare workers. The first data set used a sample of 78 platoon leaders and their direct reports, while the second data set used a sample of 1,376 nurses. Results showed that for team cohesion, team potency/efficacy, and leader effectiveness, transformational leadership behaviors are critical, while transactional leadership is more salient for task performance. Thus, to be most effective, a leader should have a full range of leadership behaviors to draw on. The strengths of the study included the relatively large sample sizes and the diverse sample. A weakness is that the historical data used may be outdated.

Harding (2007) studied the relationship between a person's leadership training and his or her leadership style and whether Army culture supported or inhibited specific leadership styles. The research design used MLQ surveys and interviews on mid-level to senior-level Army civilian leaders at the GS-13 to GS-15 in Informational Technology Management Career Program located in the National Capital Region. The sample size was 50 participants for the survey and 17 for the interviews. Results indicate that respondents who completed both the mandatory and optional Army Civilian Leadership Development Program (ACLDP) training performed transactional and laissez-faire leader behaviors more often than transformational leader behaviors. Those who completed none of the ACLDP training exhibited transformational leader behaviors more often than those who completed all the ACLDP training. This apparent discrepancy indicates that people learn transformational leader behaviors outside the training program. The study's strength was that it evaluated Army civilian leadership, while its weaknesses were the limitation to one career program and one geographic location.

Robinson (2020) researched organizational citizenship behavior and follower innovation as influenced by transformational and servant leadership. Leaders within the US Army's Logistical field self-reported and WarpPLS software analyzed the 208 response. Data indicated each type of leadership had positive effects though servant leadership had a more considerable impact than transformational. The strengths of the study were the large sample size and being conducted within the US Army. The weaknesses of the study were the self-reporting and constraint to the Logistical field.

Powe (2020) examined how federal government civilian employees perceived the effect of different leadership approaches on employee morale and productivity. Powe conducted interviews, and fifteen US Army civilian employees from 5 pay grades participated. Results showed that transformational leadership was the most effective way to enhance morale and increase productivity, while transactional was the least effective. Leading by example and enforcing organizational policies improved employee morale while micromanaging and providing little guidance reduced employee morale. Similarly, employee productivity increased when leaders challenged their employees to think creatively while giving them latitude to execute freely. The study's strength was that it focused on US Army civilians though the minimal sample size limited it.

Andrews (2020) investigated the correlation of servant leadership to employee empowerment within the Department of Defense (DOD). Using a 34-question survey, 402 DOD employees participated. The data showed a low-strength correlation and mixed results. The large sample size was positive, but a weakness was relying on employee perceptions of their supervisors.

Leadership in Technical Organizations

To get closer towards a study in what leadership for the US Army technical community would look like, the researcher searched ProQuest ABI/INFORM for "leadership skills and engineering." This query resulted in 201,746 hits.

Sawka (2006) examined how scientists within Environment Canada made career decisions to move from a technical field to a management field. The study gathered information using a mixed-methods survey and focus groups. While perceived administrative burdens on managers are a barrier to attracting scientists to managerial positions, mentorship played a crucial role in shaping employee perceptions. Though conducted in Canada, the organization studied is a government agency, so US government agencies may consider applying the findings.

Gritz, Fusfeld, & Carpenter (2017) sought to determine the most salient leadership skills and attributes for Research and Development (R&D) success. Conducting a large-scale survey of 2,500 R&D organization respondents and 4,700 non-R&D organization respondents, they measured the leadership differences between R&D organizations and other business organizations. Results showed that R&D managers are generally rated less favorably on leadership attributes than their non-R&D peers in soft skills. Managing conflict, addressing incompetence, and relating to and engaging effectively with upper management were notably lacking. R&D managers are perceived to excel in creating an innovative environment through their technical insight and global awareness. While not specific to the US Army technical community, this study offers a starting place to evaluate it. Its strength is the considerable sample size across various organizations.

Handley (2017) noticed national organizations such as the National Academy for Engineers (NAE) and accreditation bodies pushing to incorporate leadership as part of the

engineering curriculum. Handley conducted in-depth interviews with nine engineering leaders across three large engineering firms to determine four leadership characteristics and six interpersonal behavioral themes important for early-career engineers. The interpersonal behaviors are tied closely to self-awareness, self-management, social awareness, and relationship management, which comprise emotional intelligence aspects. While this study confirmed the importance of soft skills for technical leaders, its small sample size limits its applicability.

Stevens (2013) compared the leadership of civilian engineers to engineers who had military experience. The survey, conducted with 27 responses, indicated that engineers who have military experience perceived their leadership skills to be higher than those without experience. Also, engineers who have military experience believed that interpersonal skills and communication were the best qualities for leaders, while civilian engineers rated communication and being a motivator as the best. While this study may help determine the effect of military experience on technical personnel leadership readiness, its value is limited due to the small sample size.

Technical Community within the Federal Government

To better understand what leadership looks like within the Army technical workforce, a search was conducted using the term "leadership engineering and federal government," resulting in 125,070 returns. Similarly, to provide insight into the federal government technical workforce, a search of "engineer workforce" and "federal government" was also conducted and yielded 25,975 potential sources.

Melvin (2016) studied the competencies that successful system engineering leaders utilize in the defense industry, including both government and contractor employees. The study

method was qualitative interviews of system engineers with over 20 years of system engineering experience and served as a systems engineering leader on a successful acquisition program. From the sample of 25 responses, findings indicated that successful systems engineering leaders use leadership competencies such as conflict management, understanding the big picture, teamwork, building trust, and empowering others. Most respondents indicated that professional experience, learning by doing, and mentors' help enabled them to develop those competencies. This study's strength focused on engineers within the defense industry, but the small sample size was a weakness.

Van Velsor & Turregano (2011) wanted to address what leadership competencies are most important for government agencies' leaders' success and how well government sector leaders perform in those competency areas from government leaders' and employees' perspectives. Using the 106,752 Center for Creative leadership (CCL) 360-Degree assessments for 16,000 government sector managers who attended CCL development programs, the researchers found a mismatch. The most critical competencies for success did not align with government leaders' most highly rated competencies. The strength of the study was the large sample size.

Dobson (2016) examined the impact of civilian workforce talent management on organizational consciousness within the DOD. The research method utilized the FEVS along with semi-structured interviews. Two main themes emerged - the importance of recruiting people with the right skills and succession planning. The study used results from the 2011-2015 FEVS, and the yearly amount of DOD participants ranged from 48,945 to 232,462. Nine candidates completed structured interviews. The study's strengths were the numerous responses from the FEVS and the focus on DOD, while the limitation was the low interview sample.

Summary

The results of the search queries indicate that much research exists on effective leadership skills and leadership styles. While not a consensus on the specific skills needed for effective leadership, the literature suggests the importance of soft skills such as relationship skills, interpersonal skills, and communication skills. The literature also pointed to servant and transformational leadership styles as important to employee job satisfaction and performance, though a transactional style can be useful in some situations. The literature suggested that leaders in the science and engineering communities lagged in developing these skills and often needed to acquire them once moving into leadership.

While information was available on leadership within the federal government and the military services, it lacked information on the civilian technical community's leadership. The research conducted in this paper will address the gap in the literature when dealing with the preparedness of the Army science and engineering community.

Chapter 3 – Research Methodology

Introduction

This chapter focuses on the research methodology employed for this paper. The study's primary purpose is to understand the Army's technical workforce's current state of leadership skills. This chapter will review the supporting research questions and discuss the research design. Finally, the researcher examines potential bias and error and how to limit their influence.

Research Questions

Four supporting research questions explored the current state of leadership within the Army's technical workforce:

- What are effective leadership skills in the Army?
- How do non-technical skills (i.e. soft skills) contribute to effective leadership in the Army?
- What is the current state of leadership skills within the Army's technical community?
- Why is there a gap between the current state and the desired state of non-technical leadership skills in the Army?

Research Design

This research paper utilizes a qualitative case study approach due to the limitations imposed on the researcher. As part of the SSCF program, its length (10 months) limits the time allowed for this paper. Additionally, no monetary resources are available. Finally, DAU publishes this study, and since they do not have an IRB, the use of interviews and surveys to generate data is not permissible.

Because of these limitations, the researcher restricted her data search to historical studies, reports, policies, regulations, and articles accessed through EBSCO, ProQuest, Google, DTIC, the Naval Post Graduate School (NPS) repository, and GAO Reports. DAU librarian, Ms. Katherine Multop, recommended additional databases and potential search criteria to the researcher.

Using the historical data, the researcher developed the themes discussed in Chapter 4. By organizing the collected information, the researcher tracked key phrases repeated throughout the historical documents. The logical groupings of these key phrases generated themes.

Bias and Error

The researcher began her career in the Army technical community and still works closely with that community. The researcher searched for independent studies and reports written by several different sources with varied backgrounds to counteract potential inherent bias. To capture various viewpoints, the researcher used broad search terms. The data generated the themes which helped to combat bias.

Chapter 4 – Findings

Introduction

This chapter discusses the data found that address the overall research objective of evaluating the Army's technical community's current state of leadership skills. While not fully achieving this purpose, the researcher developed several related themes and will present them in this chapter. The first theme is the desired competencies for technical leaders and those skills and attributes needed to lead technical organizations successfully. The second theme revolves around leadership development within the civilian workforce.

Major Themes

Theme 1 - Desired Competencies for Technical Leaders

It was difficult to find historical data specific to the Army technical community. Though this particular material was unavailable, the researcher obtained data for the larger DOD technical workforce and the Army civilian workforce. These data apply by extension to the smaller Army technical community. The data indicate that effective communication is a top skill/competency that successful technical and civilian leaders possess. Strong technical competence, fostering teamwork, and providing guidance/direction also rated highly. The following discussion contains crucial data used in the development of this theme.

While not specific to the Army Technical community, Clardy (2017) identified six competency dimensions for lead system engineers within the DOD. These are senior engineering skills, generic manager skills, advanced cognitive skills, strategic development skills, program management skills, and non-engineering cross-functional skills. Clardy

employed multidimensional analysis (MDS) methods to determine the key competencies from job announcements for lead system engineers. Using 112 job advertisements from 56 different organizations, he identified 43 competencies common to each job announcement. From there, he applied MDS to determine the competencies that were rated the highest across the announcements. The top ten required competencies identified by the job listing are a bachelor's degree in engineering, strong verbal and written communication skills, being able to define requirements, leadership experience with engineering efforts, being able to develop and design engineering systems with documentation, provide subject matter expertise to a specific industry, developing and documenting plans such as program plans and acquisition strategies, understanding and executing testing of engineering systems, having five to ten years of related experience, and risk management experience. (Clardy, 2017)

Weiss et al. (2006) focused on Civilian Army Leadership and the interpersonal skills needed to be effective in those positions. Though broader than the Army technical community, the Army's civilian side includes technical personnel and non-technical personnel, so the data is applicable. The study consisted of surveys and interviews of 38 participants. Benefits included evaluating various levels of leadership consisting of direct supervisory, indirect supervisory, and non-supervisory positions. Communication was one focus of the study. The data indicated that most communication for all leadership levels occurs with their subordinates – approximately 38 percent of their time though, for first-level leaders, this dropped to around 25 percent. The authors surmised this drop implies difficulties that a first-time manager may have going from managing themselves and projects to managing personnel.

Additionally, ten interpersonal skills were ranked and grouped into larger categories. The most valuable group, interactive skills, includes providing guidance, listening, and conveying

information. Still considered necessary, the middle group of skills, motivational skills, consists of motivating and inspiring, team building, fostering commitment, and mentoring. The least important group, negotiating skills, contains providing employee feedback, conflict resolution, and persuading. (Weiss, Elliott, Erickson, Fowler, & Giesecking, 2006)

Godfrey (2016) created a Technical Leadership Model for Systems Engineers for the International Council on Systems Engineering (INCOSE). A cohort of 27 delegates nominated from world-wide chapters of INCOSE met to develop the model. While not directly applied to the Army technical community, the model is generalized for any type of system engineer. This diverse group of professional individuals created a model that identified six behavioral characteristics that a proficient technical leader exhibits. First, "Hold the Vision" depicts pulling together the diverse and sometimes conflicting stakeholder needs, defining success for meeting those needs, and communicating them to the project team. "Thinking Strategically" executes the plan for how to achieve the vision. "Fostering Collaboration" integrates the efforts of the various disciplines needed for the successful execution of the project. "Communicating Effectively" is essential to productive collaboration. "Enabling Others to be Successful" requires understanding when to help the team resolve difficulties while empowering them to make their own decisions where applicable. "Demonstrating Emotional Intelligence" enables the leaders to understand and utilize their team's strengths, develop team motivation, and resolve issues effectively. (Godfrey, 2016)

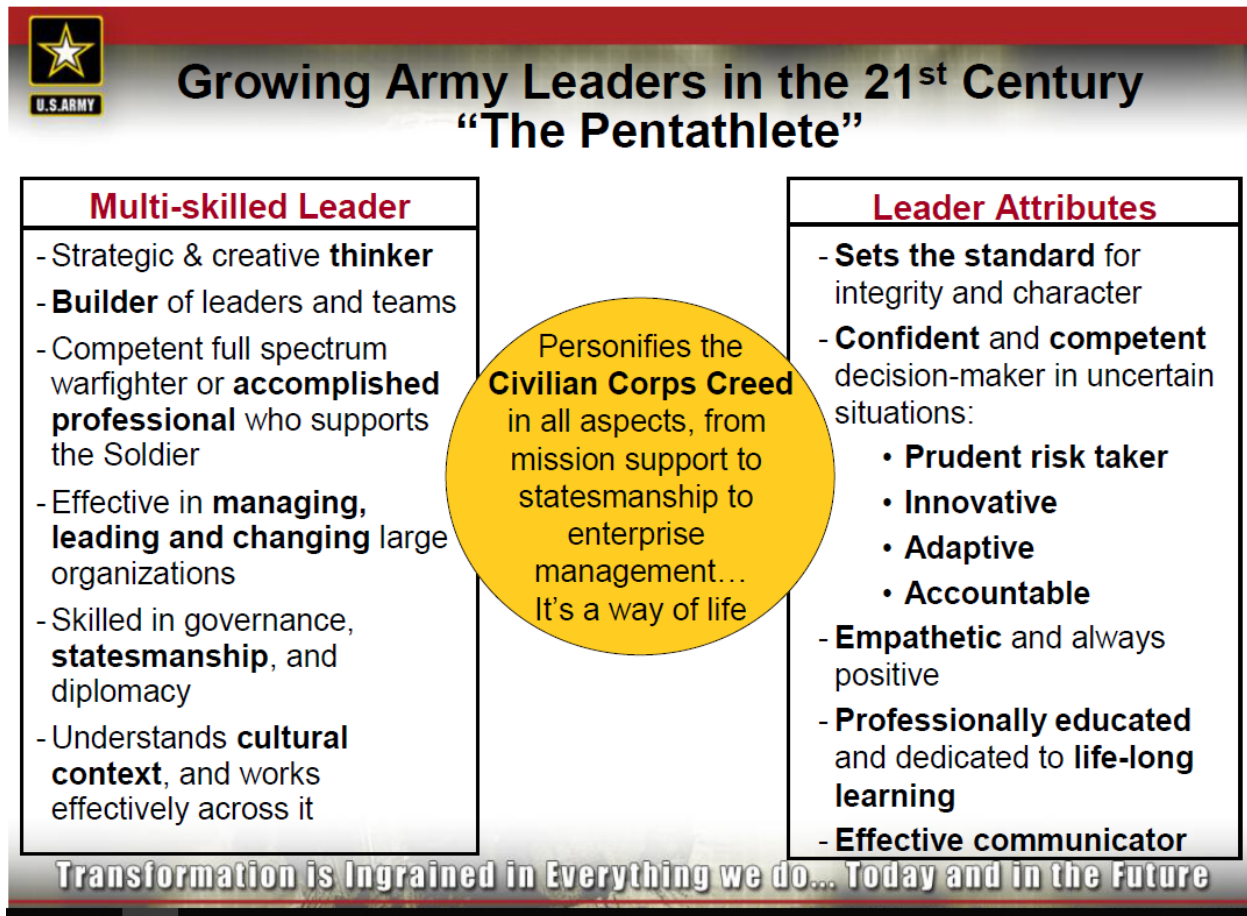
Crumpton-Young et al. (2010) examined engineering students and professionals to appraise the skills needed for successful leadership within the engineering field. While not specific to the Army technical community, the survey provides a broad base for the skills perceived as valuable within the larger engineering community. The 264 professional engineers

responded to a leadership survey evaluating the usefulness of the following leadership skills and tools: 1) technical knowledge, 2) communication skills, 3) teambuilding/teamwork, 4) personal development/continual learning, 5) strategic thinking and direction setting, 6) customer service, and 7) business management. The 213 student survey respondents perceived the following as the most crucial skills that a leader should have: communication, problem-solving, setting the example, and representing the group well. Besides identifying the critical leadership skills for engineers, the survey participants recognized the most beneficial aspects of leadership training. (Crumpton-Young, et al., 2010) Helpful leadership training incorporates "people skills – dealing with different people and personalities, team dynamics, ethics, project management, cross-functional projects, globalization, planning, facilitation and communication skills, strength discovery, conflict resolution, cross-cultural communication and learning from mistakes." (Crumpton-Young, et al., 2010, p. 18)

The Army Civilian Education System (CES) policy, established in 2006, institutionalizes leader development training and education for Army civilians. The policy coins a term called "The Pentathlete" (Deputy Chief of Staff, G-5/7/9 Training Directorate, 2006, p. 4). Figure 1 shows the skills and attributes of an Army civilian Pentathlete.

Figure 1

Skills and Attributes for the Army civilian Pentathlete



From "Army Civilian Education System Policy," by Headquarters, Department of the Army Deputy Chief of Staff, G-5/7/9 Training Directorate, Washington, DC, Nov 2006, p.5 (<https://8tharmy.korea.army.mil/CPOC/ag1cp/hrd/Approved%20CES%20Policy.pdf>).

Theme 2 – Leadership Development in the Civilian Workforce

The research question focused on evaluating the current state of the Army Technical workforce. Research data obtained did not relate specifically to this specific group but did pertain to the Army civilian workforce. Additionally, data about the larger DOD civilian workforce applies to this question. The data show that the Army and DOD have been attempting

to develop their civilian leaders for at least two decades but appear to be falling short of the objective. The following discussion reviews the historical data in this matter.

The United States General Accounting Office (GAO) (2003) conducted a study evaluating how the DOD managed its civilian workforce. At the time of the report, DOD had been downsizing its civilian workforce for over a decade. Despite its diminished numbers, the remaining workforce has taken on more significant roles. Reviewing the current human capital strategic plans, GAO reported that the plans needed further development and lacked in many vital areas, especially the skills and competencies required from its civilian workforce in the future. At the time, DOD had separate, non-integrated, human capital plans for military and civilians, which left many gaps. (United States General Accounting Office, 2003)

During the 2001-2003 time period, the Army Training and Leader Development Panel (ATLDP) conducted a study on Army training and leadership. Results from the Officer presented some results that apply to the civilian workforce. The study identified that junior officers lacked leadership development experiences, and the skills obtained from the officer education system (OES) did not provide success in the current Army environment. Like the previously mentioned GAO reports, this study identified that the Army lacked established methods and processes to assess training and leader development programs' success. (The Army Training and Leader Development Panel Officer Study Report to the Army, 2003)

Phase IV of the ATLDP focused on the civilian workforce and collected data from over 40,000 Army civilians and soldiers. The report's bottom line was that the Army lacked a comprehensive approach to develop its civilian leaders. It noted that while civilian supervisors have proficient technical and conceptual skills, they lack productive interpersonal skills. The study also highlighted that much of the civilian workforce was unaware of the opportunities

available to them for leader development and training. The study identified four major categories to improve the civilian workforce's growth: 1) Accountability, 2) Lifelong Learning, 3) Interpersonal Skills, and 4) Army Culture. (The Army Training and Leadership Development Panel Report Phase IV (Civilian Study), 2003)

As a result of the ATLDP reports, the Army began implementing some changes in 2004. First, it established the Civilian Advisory Board to serve as the bridge between the Army's uniformed and civilian members. The Board serves in an advisory capacity to the CSA on civilian workforce matters, representing Army civilians and highlighting their importance and the need to train and develop them for leadership adequately. Third, in 2006 it established the Army Civilian Corps, which is the civilian equivalent to the military Officer Corp, the Noncommissioned Officer Corps, and the Enlisted Corps. This move attempted to address Army culture by better aligning the civilian workforce with its military counterparts. The other event that addressed lifelong learning and interpersonal skills was establishing the CES in 2006. (Gan, 2007)

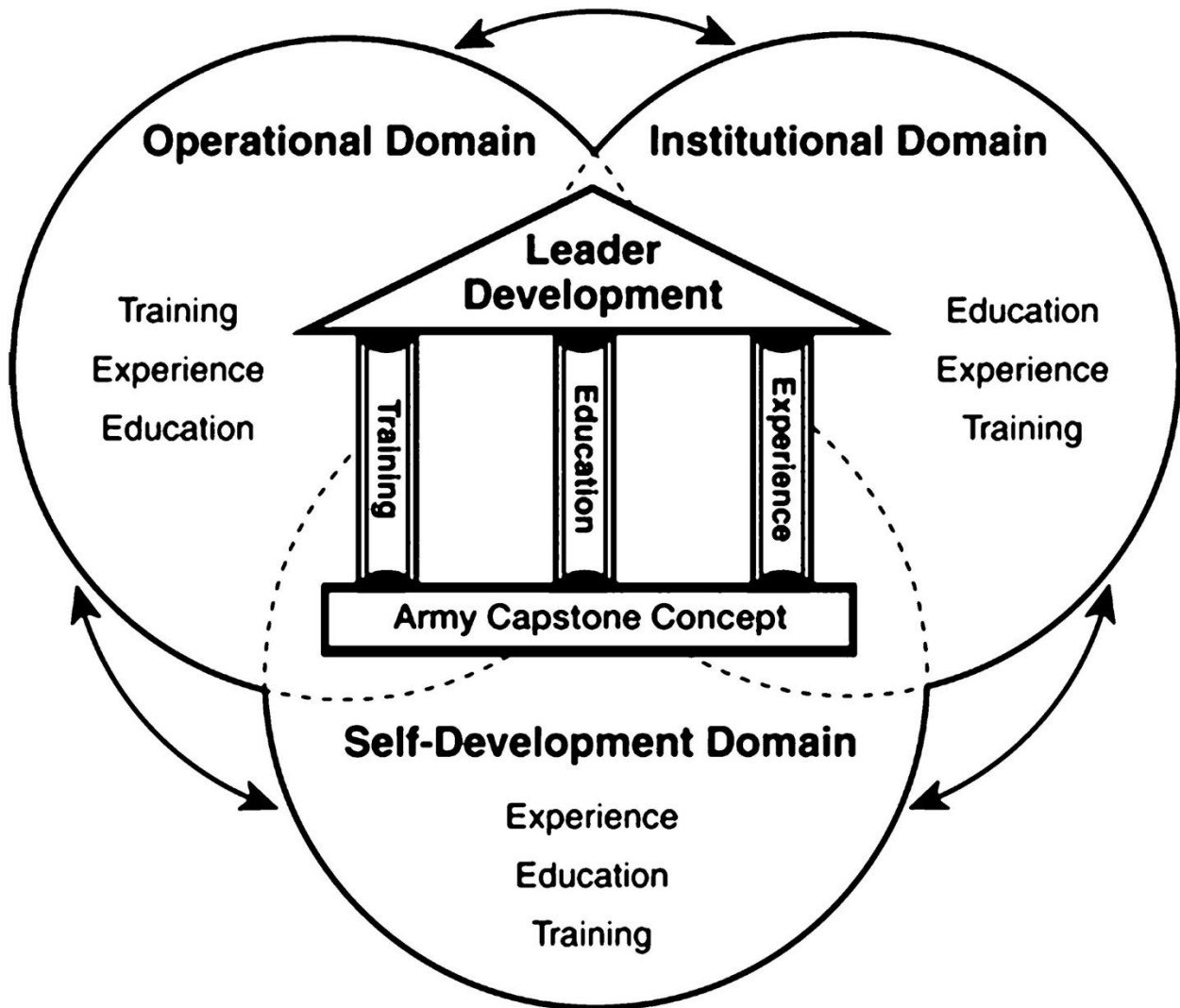
Building on the Army Civilian Corps' and CES program's establishment, the Army announced in 2010 its Civilian Workforce Transformation (CWT) Initiative, which created an enterprise approach to developing the civilian workforce. In the decade leading up to the CWT, the Army had transitioned roles from the uniform military to the civilian workforce. Including a significant quantity of and level of leadership responsibility. Before the CWT, the Army expected the civilians to have the necessary skills for these roles. However, it did not invest in the civilian side's development like they did the uniformed side. As a result of the CWT, the Army progressed in civilian workforce development by adding new CPs, establishing the Army Senior Enterprise Talent Management (SETM), funding civilians' attendance at senior service

colleges through a central fund, and creating the Army Career Tracker (ACT). (Mroczkowski, 2013)

As the Army continued to expand its approach to developing its civilian workforce, it updated its various regulations and doctrine to incorporate the Army Civilian Corps. Army Regulation (AR) 350-1 (2017) lays out the philosophy for training, educating, and developing Army civilians. In addition, it describes the available opportunities for leadership development, such as the CES and SETM. Multiple opportunities exist to build "functionally proficient, and technically competent skilled leaders who are fully capable, adaptable, and totally committed to supporting the Army's Mission." (Army Regulation 350-1 Army Training and Leader Development, 2017, p. 96) Department of the Army Pamphlet (DA PAM) 350-58 (2013) provides the processes for the Army Leader Development Program (ALDP). The ALDP, as the approved management process, defines the responsible organizations and functions to develop Army leaders. Figure 2 depicts the Army's Leader Development Model. (Department of the Army Pamphlet 350-58 Army Leader Development Program, 2013)

Figure 2

The Army's Leader Development Model



From "DA PAM 350-58 Army Leader Development Program" by Headquarters, Department of the Army, Washington, DC 8 Mar 2013, p. 2
(https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/p350_58.pdf).

While the Army had established new programs, processes, and protocols for developing its civilian workforce, how effective were those initiatives? In 2009, the Center for Army Leadership (CAL) added a civilian component to its Annual Survey of Army Leadership

(CASAL). The survey assesses the quality of leadership of Army leaders and the effectiveness of leader development. The 2009 study reported that the percentage of effective civilian leaders, as perceived by their subordinates, was 54% below the 62% for uniformed military leaders. (Keller-Glaze, et al., 2010) The civilian workforce's top leader attributes were using technical knowledge effectively, demonstrating empathy, and employing sound judgment. Within the report, the competency named "developing others" emerged as an improvement area for military and civilian leaders. Developing others refers to growing the skills, knowledge, and professionalism of personnel working within the leaders' spheres of influence. On the civilian side, another key finding affecting overall satisfaction was that most (67%) civilians were less than satisfied with their organizations' opportunities for advancement. As far as being prepared for the next leadership opportunity, civilians found operational experience (85%) and self-development (75%) to be more beneficial than institutional training (62%). (Keller-Glaze, et al., 2010)

The 2016 CASAL reported the civilian and uniformed military responses in separate reports. The report presented leadership effectiveness index scores and indicated stability in performance for both leadership competencies and attributes. While positive, there is room for growth in most of the leadership competencies. The survey also determined that when ratings were high for leadership attributes and competencies, there was a positive correlation to the work environment. Teams showed high-quality work, better cohesion, discipline, and mission completion while also demonstrating high trust, organization engagement, and morale. (Riley, Cavanaugh, Jones, & Fallesen, 2017)

Like the 2009 report, respondents rated operational experiences (74% managers/63% first-line supervisors) and self-development (75%/65%) as more effective than institutional

training (59%/54%). Likewise, development of others remained the lowest competency for all civilian leaders. Army civilian leaders identified stress from high workload as a serious problem, and the trend from 2009 to 2016 indicates no improvement over those years. The main reason suggested for this level of stress was insufficient personnel brought about from hiring freezes, reduction in the civilian personnel levels, and increased workload being done by the civilian workforce. The stress of a high workload can affect the number of experience (operational) assignments as well as self-development since mission completion comes first. This environment furthers the perception by many Army civilians that opportunities to get a better job in their organization are limited. (Riley, Cavanaugh, Jones, & Fallesen, 2017)

Mattero (2018) conducted a survey of army civilians in CP 33, Ammunition Management, to evaluate leader development's effectiveness within that career field. Though limited to only 13 participants, it highlighted some CP33 workforce perceptions. The first is that leaders of personnel in this career program do not assess, develop, or support their subordinates. Additionally, those who attended CES classes appear not to apply their learning when returning to their positions. The survey supports the CASAL findings that developing others is a less established competency in some Army leaders. (Mattero, 2018)

The 2016 CASAL report was the last one available. Since that report, the Army has continued to refine its talent management initiatives. In 2019, the Army published The Army People Strategy (APS). It documents the Army's plan to shift to a deliberate talent management plan for the Army's military and civilian members. The intent is to create "a 21st century talent management system with policies, programs, and processes that recognize and capitalize the unique knowledge, skills, and behaviors possessed by every member of the Army team, allowing us to employ each to a maximum effect." (The Army People Strategy, 2019, p. 2) In 2020, the

Army released its Civilian Implementation Plan (CIP) of the APS. The CIP seeks to change the internal Army culture for managing the civilian workforce while still meeting the requirements of Title 5, United States Code, which governs the civilian workforce. The Army wants "to capitalize on the unique and vital contributions Army civilians provide" by employing "a tailored approach to talent management that recognizes the unique nature of civilian employment in the Army." (Army People Strategy Civilian Implementation Plan, 2020, p. 5) Using data, Army leaders will provide a strategic analysis of the civilian skill sets and match that talent with opportunities throughout the organization. Leaders will be responsible for reviewing current assignments and where individuals desire them to encourage operational experiences to develop and grow those individuals. In addition, the CIP prioritizes building world-class supervisors who are responsible for developing their team. (Army People Strategy Civilian Implementation Plan, 2020)

Conclusion

While investigating the readiness of the Army technical community to lead, specific data was difficult to find. The researcher did find information about leading technical organizations, which led to the first theme of the desired competency of technical leaders. Data from this larger group applies to the smaller subset of the Army technical community. Limited data were obtained about the development and current state of the Army technical community as it pertains to leadership; however, data was available about the larger Army civilian population. Chapter 5 covers the findings, conclusions, and future study recommendations.

Chapter 5 – Interpretation

Introduction

In Chapter 4, the researcher presented the data found regarding the research question on the leadership readiness level of the Army technical community. Two themes arose – the necessary leadership competencies of a technical leader and the civilian workforce's development. This chapter provides conclusions, recommendations, and the limitations of the research.

Conclusions

This research used a historical analytical approach to determine the applicable documents from search results numbering in the thousands. From these initial results, the researcher examined over 80 relevant documents. Further refinement narrowed this group down to those which provided the necessary data. With this data, two themes developed, and the following conclusions made:

1. Effective leaders of technical organizations possess competencies, attributes, and skills categorized as hard (e.g. technical knowledge, business management) and soft (e.g. empathy, communication).
2. Top-rated technical leaders communicate effectively. Presenting complex technical information in a readily understood way, they gain support from decision-makers for their initiative/program/etc.

3. The Army has been investing in its civilian workforce for the past two decades; however, its civilian leadership development's effectiveness still needs improvement. Results from the several years of CASAL reports demonstrate that developing others remains a weakness. Additionally, the Army just revamped its comprehensive strategy for developing its talent management with the APS release.
4. Currently, the status of leadership development for the Army technical community is inconclusive due to the lack of data on that specific subset of the Army. Assuming cohesive results across the various career programs implies that the Army technical community needs to improve its leaders' development. A review of the data indicates that culture and workload stress contribute to civilian leaders' lower ratings.

Recommendations

The analyzed data provides for the following recommendations:

1. Under the CIP, develop measures for tracking the development of leaders within the different career programs. While several competencies apply to leaders of all types of functions, leaders of technical organizations need to develop a unique mix of hard and soft skills. Tailor leadership development for potential technical leaders to meet these needs.
2. Reinstate the CASAL or a similar study to provide metrics to senior Army leadership on the new APS's effectiveness. Include in the future studies a way to measure the effect of culture on civilian leaders' development. Also, break up the results into the Army's various functional areas such as STEM, business management, finance/accounting, etc.

3. Future research should evaluate the technical community's condition using surveys or interviews with that subset of the Army civilian workforce.

Limitation of the Study

This study focused on the preparedness of the Army technical workforce to lead. Due to the SSCF program's limitations, the researcher used historical documents instead of a survey or interview of the target population. Because of this restriction, the available data was for the larger Army civilian workforce and general technical organizations. Also, the SSCF program duration and competing requirements of the program restricted the time available for research.

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Glossary of Acronyms and Terms

ACLDP	Army Civilian Leadership Development Program
ACT	Army Career Tracker
ADP	Army Doctrine Publication
ALDP	Army Leader Development Program
ANOVA	Analysis of Variance
APS	Army People Strategy
AR	Army Regulation
CAL	Center for Army Leadership
CASAL	CAL Annual Survey of Army Leadership
CCL	Center for Creative Leadership
CIP	Civilian Implementation Plan
CP	Career Program
CSA	Chief of Staff of the Army
CWT	Civilian Workforce Transformation
DA PAM	Department of the Army Pamphlet
DAU	Defense Acquisition University
DOD	Department of Defense
FEVS	Federal Employee Viewpoint Survey
GAO	Government Accounting Office
INCOSE	International Council on System Engineering
IRB	Independent Review Board
IRS	Internal Revenue Service
IT	Information Technology
MDS	Multidimensional Analysis
MLQ	Multifactor Leadership Questionnaire
NAE	National Academy for Engineers
R&D	Research and Development
SETM	Senior Enterprise Talent Management
STEM	Science, Technology, Engineering, and Mathematics
US	United States
ACLDP	Army Civilian Leadership Development Program