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Strategies to Retain Science, Technology, Engineering, and Mathematics Civilian Employees in U.S. Army Cyberfocused Organizations

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This is to certify that the doctoral study by

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Abstract

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by

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MA, Webster University, 2006

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

Retention challenges can adversely affect culture and lead to mission failure in a cyber-focused organization. Supervisors are concerned with retention challenges because frequent turnover can cause businesses and organizations in the private and public sectors to fail at achieving strategic goals. Grounded in Herzberg's hygiene-motivation theory, the purpose of this qualitative single case study was to explore strategies U.S. Army supervisors in the southeastern region of the United States use to retain civilian personnel with science, technology, engineering, and mathematics (STEM)-related degrees. The participants were four U.S. Army supervisors of personnel with STEM-related degrees from a single organization who were successfully retaining STEM personnel. Data were collected using semistructured interviews, peer-reviewed articles, books, journal notes, internal organizational policies and procedures, government documents, and historical data. Through thematic analysis, four themes were identified: (a) salary and monetary incentives, (b) the work itself, (c) individual considerations, and (d) transactional retention. A key recommendation is for supervisors to reassess education requirements for hard-to-fill STEM cyber work roles. The implications for positive social change include the potential to motivate personnel with unique skills to enhance the workforce and increase the likelihood of achieving organizational goals.

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Dedication

I dedicate this study to God for allowing me to get to the finish line and to everyone He placed in my life at the appointed time. He knew who and what I needed to see this study to fruition. I also dedicate this work to my grandparents, Freeman and Emma Kate Collins. They are not here to witness this milestone, yet I continue to push and do more to make them proud in Heaven. Finally, I dedicate this achievement to my husband, Alonza, who sees more in me than I ever have. I appreciate you moving obstacles, making life easy, supporting me, and motivating me on the journey with tough love and gentle hugs.

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I acknowledge my daughter, Dasia, and grandson, King; thank you for being a big part of my *why*. To my mother, Paula, and my bonus parents, my aunts and uncle, thank you for nurturing, teaching, and guiding me. To my Aunt Yvonne, who, on our last visit together, while playing Two Truths and a Lie, was the only person who unequivocally *believed* that becoming Dr. Collins-Hines was my truth. To my friends and colleagues who read my work, listened to me rework ideas, and allowed me to vent in a safe space, thank you for encouraging and believing in me. I also want to acknowledge Dr. Neal; I could not have asked for a better guide and mentor on this journey—thank you.

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Section 1: Foundation of the Study

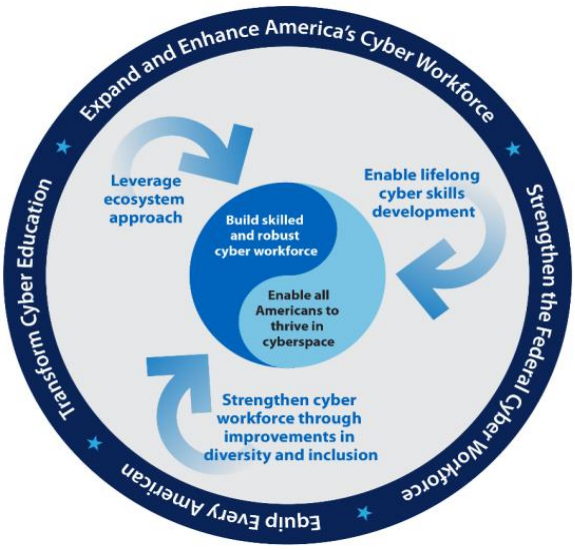
In keeping with Executive Order No. 14,028 (2021) signed by President Biden, U.S. Army leaders and supervisors are responsible for acquiring and retaining science, technology, engineering, and mathematics (STEM) graduates to improve the nation's cybersecurity posture and complement the military cohort. Retaining STEM graduates due to salary caps, inflexible work schedules, culture, and expectation misalignment challenges U.S. Army leaders and supervisors (Ramsey, 2020). Talent management is critical to mitigating attrition and organizational success (Sopiah et al., 2020). U.S. Army leaders' and supervisors' role in talent management is imperative, and failure to address organizational and personnel requirements may lead to operational gaps and increase exposure to Department of Defense (DoD) networks and national security. Findings derived from this study may allow U.S. Army supervisors and leaders to refine retention strategies, mitigate turnover, and better understand what motivates personnel to remain with the organization.

Background of the Problem

In Executive Order No. 14,028 (2021) and the National Cybersecurity Strategy (Biden, 2023a), President Biden required government agencies to collaborate with the private sector and invest in technology and human resources to strengthen cybersecurity. While the National Cybersecurity Strategy outlines a plan to secure the nation (see Figure 1), the demand for personnel is constant, and the cyber landscape continues to grow. Globally, private and public sector organizations require a robust cyber workforce to keep up with the ingenuity and evasiveness of cyber criminals and nation-state threats.

Figure 1

National Cyber Workforce and Education Strategy



Note. President Biden and Vice President Harris's Nations Strategy Overview. From *National Cyber Workforce and Education Strategy: Unleashing America's Cyber Talent* by The White House, Office of the National Cyber Director, 2023 (https://www.whitehouse.gov/wp-content/uploads/2023/07/NCWES-2023.07.31.pdf). In the public domain.

Cyber threats include nation-state actors with vast resources, cyber gangs or criminals committing cybercrimes for profit, and mischievous script kiddies or hackers known for attacking and breaching sophisticated networks within the private and public sectors (Akram & Ping, 2020). The demand imposed by cyber threats expanded the DoD's responsibility from physically defending the nation to protecting the country from malicious activity in the cyber domain (Urias et al., 2018). With this proliferation and

advancement of technology, the demand for a qualified cybersecurity workforce is ever more essential (Biden, 2023a, 2023b; Urias et al., 2018). Despite the increasing number of recent college graduates in STEM-related fields, there remains a deficit in computer science to meet cyber workforce demands in the DoD. Cyber workforce deficiencies impede security efforts, increasing the nation's vulnerability. To defend the cyber domain, DoD leaders developed three key functionalities:

- defend the DoD infrastructure,
- defend the nation against cyberattacks, and
- support military operations (Crumpler & Lewis, 2019; Nakasone, 2019, 2021).

While the demand for STEM personnel is likely to increase as technology advances, leaders may need to explore methods beyond the stringent processes and procedures used currently in the public sector to recruit and retain personnel required for key cyber and information technology work roles.

Talent management needs within the DoD will increase mainly in information-technology-related fields and cyber. In the United States, projections show that the demand for information technology occupations will increase by 12% by 2029, equating to more than 500,000 job vacancies (Zilberman & Ice, 2021). The allure of fighting cyber threats, an ever-changing environment, and a unique culture make STEM graduates ideal candidates; however, U.S. Army supervisors continue to grapple with talent management and frequent turnover in critical cybersecurity work roles where STEM degree holders

are key. This study explored U.S. Army supervisors' strategies to retain cybersecurity civilians with STEM credentials.

Problem and Purpose

The specific business problem is that some U.S. Army supervisors within DoD organizations in the southeastern region of the United States lack strategies to retain personnel with information technology STEM-related degrees. Therefore, the purpose of this qualitative single case study was to explore strategies U.S. Army supervisors in the southeastern region of the United States use to retain civilian personnel with STEM-related degrees, focusing on a single DoD (Army) organization.

Population and Sampling

The focus of this study was on supervisors of civilian personnel with STEM-related degrees in cyberfocused organizations in the southeastern region of the United States. The participant pool for this study was limited; therefore, I selected participants via purposive sampling. Purposive sampling allowed for selecting participants close to the subject and was most likely to yield data conducive to addressing the phenomena (Campbell et al., 2020). Analytical generalizations for qualitative studies require small sample sizes (Yin, 2018). The ideal sample size for this study was four to five supervisors of civilian personnel with STEM-related degrees. When the scope of the research problem is narrow and specific, selecting a small number of participants capable of providing rich data is sufficient (Gill, 2020). I interviewed supervisors of personnel with STEM-related degrees as a primary source of data. In addition, this study included the following secondary sources to address the research question: organizational internal

policies, historical data obtained from exit interviews, training guides, and Office of Personnel Management (OPM) information.

Nature of the Study

The foundation of my research question was inductive to explore retention strategies that addressed a specific phenomenon in a defined environment. I considered three methods of study: quantitative, qualitative, and mixed method. The quantitative approach is highly structured, rigid (Kyngäs, 2020), and deductive, and it requires statistical analysis to investigate cause and effect based on existing theories (Bloomfield & Fisher, 2019). I did not use this method because of its rigidity and empirical nature in testing existing theories to explain relationship interdependencies via variables and concepts.

The qualitative research method is flexible (Haven & Van Grootel, 2019) and will allow for exploration to understand phenomena using semistructured interviews, historical data, and observations to address the research question (Saunders et al., 2015). Lastly, the mixed-method approach integrates data derived from qualitative and quantitative methods for analysis and interpretation (Şahin & Öztürk, 2019). The mixed method requires a vast number of randomized participants and numerical data to investigate relationships (Saunders et al., 2015) and includes the rigid nature of the quantitative method. I did not choose the mixed method because participants were limited. The qualitative method was best suited to capture individual viewpoints and diverse opinions via semistructured interviews to address the phenomena.

In addition to the research method, the research design is a critical aspect of the study. I considered the following research designs for this study: phenomenology, historical research, grounded theory, and case study. The research design is a comprehensive plan to collect and analyze data to answer the research question (Saunders et al., 2015). The single case study research design was the best option for this study. The phenomenology research design was not appropriate for this study because it is narrow in scope and is grounded in philosophy. While researchers use the phenomenology design to capture participants' lived experiences, it excludes organizational impact (Saunders et al., 2015). A historical research design requires the researcher to use historical data to understand how the past affects the present and future (Yin, 2018). The historical research design was inappropriate because this study was based on a recent phenomenon. Last, a grounded theory research design allows the researcher to develop post-data collection and analysis to generate and test the theory (Chun Tie et al., 2019). I did not select the grounded theory because the conceptual framework for my study was Herzberg's motivator-hygiene theory (also referred to as the two-factor theory), which is an established theory, and collecting data to generate an idea was not the focus of this study.

A single case study research design allowed for exploring the phenomenon, affected participants, and the organization over time. According to Yin (2018), single case studies will enable the researcher to explore a phenomenon intertwined with and affected by social interactions using varied data sources. A single case study is appropriate when the environment or situation is unique (Yin, 2018). There are a limited

number of cyberfocused organizations within the U.S. Army, and analysis within a real-life setting was vital to gain insight to address the research question.

Research Question

What strategies do DoD-Army supervisors in the southeastern region of the United States use to retain civilian personnel with information technology STEM-related degrees?

Interview Questions

1. How would you describe the role of personnel with information technology STEM-related degrees within your organization?
2. How did you decide whether work roles required personnel with STEM degrees?
3. What challenges did you face in retaining civilian personnel with information technology STEM-related degrees?
4. What strategies are you now using to successfully retain personnel with information technology STEM-related degrees?
5. What strategy worked best to successfully retain personnel with information technology STEM-related degrees?
6. How did your personnel respond to retention strategies?
7. What were the key barriers to implementing retention strategies to successfully retain personnel with information technology STEM-related degrees?

8. How did you overcome the key barriers to implementing retention strategies to successfully retain personnel with information technology STEM-related degrees?
9. What additional information can you share about your organization's retention strategies to successfully retain personnel with information technology STEM-related degrees?

Conceptual Framework

The conceptual framework for this study was Herzberg's hygiene-motivation theory. Herzberg introduced the hygiene-motivation or two-factor theory in the co-authored book *The Motivation to Work* (Herzberg et al., 1959). Herzberg's two-factor theory is used among researchers to examine the relationship between job satisfaction and attrition. Herzberg (1965) surmised that specific work situations and events influenced employees' job satisfaction and dissatisfaction. The theory of motivation and hygiene differentiates two factors that affect job satisfaction: satisfiers (motivators) and dissatisfiers (hygiene; Herzberg et al., 1959). Supervisors' understanding and acceptance of both factors are critical in mitigating attrition to address organizational needs and achieve strategic goals.

The U.S. Army workforce consists of active-duty soldiers, veterans, and personnel sans military affiliation spanning multiple generations. Historically, the U.S. Army has had a reputation and culture considered inflexible and authoritative (Thompson, 2020), which may impede organizational bonding and commitment, causing an increase in employee turnover. While ample opportunities are available in Army

civilian work roles, more opportunities exist in the private sector. For this study, Herzberg's (1965) theory helped clarify what motivates STEM personnel in exploring strategies used by managers to retain them.

Supervisor engagement eases communication and builds trust, allowing employees to relay what they consider essentials or satisfiers, leading to job satisfaction. Employees require individualized consideration to achieve job satisfaction across cohorts (Virgiawan et al., 2021). Leader engagement and investment in retention strategies may motivate and empower personnel to achieve organizational goals and decrease job satisfaction (Al-Hussaini et al., 2019). When employees feel empowered, a bond develops, which leads to increased commitment and minimizes turnover (Murray & Holmes, 2021). For this study, Herzberg's (Herzberg et al., 1959) two-factor theory illuminated U.S. Army supervisors' strategies to engage and retain civilian STEM personnel.

Operational Definitions

Cyberfocused organizations: Cyberfocused organizations in the DoD engage in cybersecurity and cyber threat activities (Urias et al., 2018). Such organizations may also conduct cyber experiments to train, test, and analyze cyber platforms and systems (Urias et al., 2018). Such organizations aim to conduct cyber defense and system analysis (Urias et al., 2018).

Science, technology, engineering, and mathematics (STEM): STEM refers to academic programs and training within the four fields of science, technology, engineering, and mathematics (Stewart & Agrawal, 2021). Personnel with STEM

credentials are in demand within the DoD, specifically for cybersecurity, but candidates are limited (Stewart & Agrawal, 2021).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are inherent to research. According to Johnson et al. (2020), assumptions are unproven beliefs critical to research. The first assumption was that participants' responses would remain truthful and reflect their personal and professional abilities and actions. The goal was to ensure that participants were comfortable as each selected a meeting location away from their work location and a time. The second assumption was that leaders would support my research efforts, understanding that findings may improve practices, strengthen organizational cohesiveness, increase productivity, and allow for better use of resources. To achieve that end, participants received a detailed explanation outlining the purpose of the study, the importance of the information derived from their interview, and the intent of subsequent member checks, including the benefits of improving their organization and mitigating retention challenges. Interviews allow the author to establish rapport, personalize the experience, and gain clarity with follow-up questions to understand participant responses better (Davies et al., 2020). The last assumption was that data saturation was achievable with limited participants. Because the organization had limited participants and the retention problem had remained a point of contention since the start of the organization in 2017, I assumed participants had similar experiences and assessments and worked closely to resolve the problem.

Limitations

The main limitations of this study were researcher confirmation and social desirability biases. Limitations can affect research outcomes and should be explicitly addressed to build trust with the reader and establish research significance with the targeted community of interest or industry (Ross & Bibler Zaidi, 2019). Confirmation bias occurs when the researcher interprets data to answer the research question or support data (McSweeney, 2021). In addition, interview questions may inadvertently elicit emotional responses or cause discomfort (Wiles, 2013), prompting participants to alter their responses, creating social desirability bias. Bergen and Labonté (2020) theorized that social desirability bias occurs when participants need to modify responses to shield themselves from negative perceptions. The onus lies with the researcher to implement a process to mitigate personal and participant bias throughout the research process.

Delimitations

The researcher must include delimitations to safeguard relevance to the greater community or industry. A delimitation allows the researcher to restrict the scope of research by communicating to the reader what the study will include (Alexander, 2020). This study had two delimitations. The first delimitation was using a single U.S. Army cyberfocused organization. The second delimitation was limiting the focus of the study to participants with experience managing and retaining personnel with STEM-related degrees within an organization with high turnover. The scope of participant criteria was narrowed to a minimum of 5 years of experience with hiring, managing, and retaining personnel with STEM degrees to contribute to study findings.

Significance of the Study

Contribution to Business Practice

The private and public sectors experience retention challenges, and business leaders continuously seek new techniques and strategies to retain personnel. This qualitative study was intended to help U.S. Army supervisors better understand strategies to retain personnel with vastly different skill sets, education, and motivators. Findings derived from the study may be of value because retention challenges negatively impact achieving strategic organizational goals. Cyber professionals with information technology STEM-related degrees are in high demand because breaches occur in the private and public sectors (Zilberman & Ice, 2021). This study may help private and public sector leaders overcome retention challenges when personnel have unique skills or where personnel constitute a small yet critical part of their organization.

Implications for Social Change

The implications of this study for positive social change included the potential to understand better what motivates personnel with unique skill sets when organizational constraints create an environment prime for increased turnover. This study's findings will potentially provide leaders with strategies to mitigate retention, improve cohort acceptance, and promote a positive organizational culture. In addition, these findings may invoke leader introspection to assess their emotional intelligence and its impact on employee motivation. An emotionally intelligent leader is more apt to recognize individualized motivators in the workplace and reduce turnover (Bass, 1996). Lastly,

study findings may serve as a conduit to help organizations Army-wide identify gaps to retain civilian personnel represented in small numbers or with unique skill sets.

A Review of the Professional and Academic Literature

The purpose of this qualitative study was to explore strategies leaders used to retain personnel with STEM-related degrees. With attractive salaries and workplace flexibilities offered in the private sector, understanding what motivates a niche group of individuals in high demand but low supply is critical to retaining a highly skilled workforce. The cyber workforce needs the knowledge STEM personnel bring to address complicated, technical problems (Dwyer et al., 2020; Furnell, 2021; U.S. Government Accountability Office, 2021). However, the purpose of this study was to concentrate on methods to keep civilian personnel with STEM degrees in an organization strictly dedicated to cyber operations.

To answer the research question, extensive research was conducted to synthesize information gained from peer-reviewed articles, dissertations, government documents, and books. In this literature review, I explore the following points of interest—Herzberg's motivation-hygiene theory, theory application and impact in the workplace, leader engagement, and employee turnover (in general and specific to the DoD)—and close with a review of the interdependence of cyber, STEM, and the DoD. To thoroughly search for applicable information, I used the following online databases: ScienceDirect, SAGE, Thoreau, ProQuest, Google Scholar, Military and Government, Semantic Scholar, EBSCO, and Walden University e-library.

The keywords searched included *STEM*, *Department of Defense—Army (DoD-A)*, *retention, talent management, hiring, cyber, cybersecurity, attrition, emotional intelligence, workforce planning, computer science, computer engineering, analytics, manpower, staffing, self-efficacy,* and *culture*. The literature review contains 184 references consisting of 157 peer-reviewed sources. One hundred fifty-seven, or 85%, of referenced sources were published within 5 years from the expected completion date of my study, and 20, or 11%, of references, were published more than 5 years from my anticipated graduation date of 2024 (see Table 1).

Table 1

Study References

References: Type and age	< 5 years	> 5 years	Total
Peer-reviewed	157	12	169
Not peer-reviewed	7	8	15
Total	164	20	184

Herzberg's Motivator-Hygiene Theory

Herzberg's motivator-hygiene theory is one of the most referenced theories in human resource management. Simić (2020) argued that Fredrick Herzberg (Herzberg et al., 1959) effectively determined what employees wanted from their work experience in developing the motivator-hygiene theory. The theory evolved from a study conducted by Herzberg in the 1950s to establish specific work elements that made employees feel exceptionally good or bad about their jobs (Herzberg et al., 1959). The study revealed

that certain workplace factors related to job satisfaction while others created job dissatisfaction. Herzberg's (1968) study delineated the difference between job satisfaction (motivators) and job dissatisfaction (hygiene). While Herzberg's two-factor theory addressed intrinsic and extrinsic factors, autonomy and the perceived importance of work contributions are critical to job satisfaction.

In Herzberg's discovery of job satisfiers and dissatisfiers, he realized that job satisfaction is industry agnostic. One of the main observations in Herzberg's study was that the opposite of job satisfaction is not job dissatisfaction (Herzberg, 1965). Therefore, the observation implied that managing hygiene factors would minimize job dissatisfaction but could not motivate or create job satisfaction. In the opinion of Herzberg (1968), good working conditions in the workplace will retain employees but will not make them work harder; poor conditions, on the other hand, will lead to loss of talent as employees will quit. Alfayad and Arif (2017) argued that a workplace with numerous job satisfiers (or motivators) would improve performance and retain employees. Failure to identify and enhance job satisfaction will not necessarily lead to dissatisfaction and poor performance; however, employees will not perform at their best. Herzberg's study underscored the importance of motivation factors in improving job satisfaction, which appeased employees' needs for growth and self-actualization.

Motivation and Hygiene Factors

Retention is a concern across the workforce, and understanding how to improve or mitigate retention is critical. The motivating factors that Herzberg (1965) identified include achievement, work, responsibility, recognition, growth, and advancement. In

contrast, hygiene factors include company policy, job security, salary, supervision, workplace interpersonal relationships, and working conditions (Herzberg, 1965). Herzberg's two-factor theory laid the foundation for organizations to develop strategies to minimize turnover. Other findings suggest that personnel perspective, life circumstances, age, and other elements may dictate the more impactful factors (Rombaut & Guerry, 2020). The impact may occur in levels that fluctuate over time (Mehrad, 2015). Alshmemri et al. (2017) agreed with the premise of Herzberg's theory yet offered added insight into the weight and impact of motivator factors over hygienic factors. Scholars offer competing views and suggest that factors are not prescriptive and elicit different responses based on the individual. Herzberg's work allows leaders and employers to examine job satisfaction through a baseline lens; however, there must be consideration for the desires and needs of the individual.

Leadership and Relationships

Workplace interrelationships among employees are another critical hygiene factor identified by Herzberg. Establishing positive peer relationships is crucial to empowerment and self-awareness (Imam et al., 2020). Advocating for positive and healthy relationships among employees minimizes the possibilities of harassment, increases camaraderie among team members, and creates a workplace conducive to elevated levels of job satisfaction among employees.

Workplace supervision is another hygiene factor highlighted by Herzberg's study and underscores the need for organizations to vet their supervisors thoroughly to minimize job dissatisfaction and increase satisfaction. Good employees do not always

make good supervisors (Alrawahi et al., 2020). Effective supervisors possess leadership skills required to engage employees in a manner that makes them feel appreciated and respected. Bateh (2019) found that transformational leadership characteristics proved to be the most desirable and practical. In appointing supervisors, firms must critically assess their abilities and attributes.

Transformational Leadership

James McGregor Burns introduced transformational leadership theory in 1978, and Bass and colleagues later developed the theory further (Bass, 1996; Bass & Stogdill, 1990; Sefidan et al., 2021). The premise of transformational leadership is that transformational leaders appeal to their followers' values and transform them to drive improved performance (Murray & Holmes, 2021; Virgiawan et al., 2021). Within existing literature, transformational leadership improves outcomes among followers, including engagement, job performance, organizational commitment, and turnover (Sefidan et al., 2021). Transformational leaders exhibit flexibility not found in other leadership styles and are ideal when responding to individual needs to improve organizational effectiveness and efficiency.

It is essential to consider the application of transformational leadership. Bateh (2019) maintained that transformational leader characteristics proved to be most desirable and practical. Transformational leaders' abilities and attributes are conducive to establishing positive relationships and are crucial drivers of empowerment and self-awareness. A leader who recognizes the need to advocate for positive and healthy relationships among employees minimizes the possibility of harassment, increases

camaraderie among team members, and creates a workplace conducive to elevated levels of job satisfaction among employees.

The Impact of the Workplace

Conducting a holistic evaluation is needed to identify motivation and hygiene factors fully. Herzberg (1965) recommended that firms improve the quality of the physical workspace to reduce job dissatisfaction. For example, congested, poorly ventilated, and unsafe working spaces will only increase job dissatisfaction (Alfayad & Arif, 2017). Herzberg also highlighted the role of salary packages in influencing employees' perception of job dissatisfaction. Consistently evaluating employees' salary expectations may help managers identify earning mismatches, reducing job dissatisfaction. Addressing motivation factors in the workplace requires firms to address workplace attributes that positively impact employees' morale (Alfayad & Arif, 2017). Herzberg identified career advancement as one of the critical motivators in the workplace. In his study, Herzberg defined advancement as the upward and positive progression of an employee's position or status in the workplace. Establishing a clear and objective path for all employees to progress in a firm is a motivating factor.

The Work Itself and Recognition

Herzberg identified the work entrusted to an employee as another source of motivation. Work can only be a motivating factor if an employee's skills and ability match the assigned tasks. It is vital for supervisors to continually assess personnel's skill levels to ensure that the difficulty and engagement levels of the tasks align (Alfayad & Arif, 2017). Herzberg's study highlighted the need to match responsibilities with

authority in the workplace. Employees gained satisfaction by fulfilling obligations, making positive contributions, and possessing the power to make decisions (Dowling, 1971). Idle work that falls short of contributing to the team and organizational goals lacks meaning and may lead to turnover and skill atrophy.

Recognition practices, on the other hand, allow leaders to acknowledge top achievers and encourage others to pursue excellence and enjoy top performers' accolades. Herzberg (1968) found that implementing employee recognition as a motivator pushed employees to exceed set targets. Recognition and rewards directly influenced performance, communicated approval, and served as feedback (Osborne & Mohamad, 2017). In addition, when managers recognize personnel, the act instills pride, and employees feel appreciated (Tirta & Enrika, 2020). Managers' acknowledgment of personnel based on accurate alignment of work roles, commensurate with recognition, increases personnel commitment and productivity. When leaders display organizational loyalty, personnel give loyalty in return (Andriyanti & Supartha, 2021). The organization repeatedly benefits when transformational leaders' charisma and confidence are positive examples to peers and employees.

Applying Theory in the Workplace

Through this study, I aimed to identify employee retention strategies supervisors use to retain a specific group of employees in cyberfocused organizations. One of the main principles recommended by Herzberg entails granting employees more autonomy in the workplace (Herzberg, 1965). Employee autonomy enhances responsibility as employees feel a greater sense of achievement entrusted to them by their employer

(Mehrad, 2015). Autonomy also creates a sense of ownership among employees, resulting in a higher level of motivation (Martin & Goldwasser, 2022). In an interview conducted by Dowling (1971), Herzberg recommended using feedback mechanisms to improve levels of communication between employees and management. Open communication channels allow for real-time exchange and constructive feedback, which helps form bonds and build trust.

While scholars widely reference Herzberg's (1968) findings in human resource management theory and practice, some scholars have cautioned against embracing the theory without considering its limitations. One of the main criticisms of Herzberg's approach is the possibility of bias in identifying hygiene and motivating factors, as cited by Thant and Chang (2021). Identifying motivational and hygiene factors in an organization is subjective. No two employees will agree on similar workplace factors that motivate them or result in job dissatisfaction; therefore, leaders must exercise flexibility when training, developing, and addressing concerns.

Theory Criticism

Like other theories, Herzberg's theory is subjected to scholarly scrutiny. Herzberg et al. (1959) argued that improving job satisfaction results in greater productivity as employees feel fulfilled by their daily tasks. Experiments and studies have revealed that increased job satisfaction does not always result in increased productivity (Koziol & Koziol, 2020). In an ideal setting, employees will always identify with the factors that favor them at the company's expense. Koziol and Koziol (2020) argued that Herzberg's theory does not account for individual employees' perceptions or situations, underscoring

its weakness in applying its concept at an organization-wide level. Another criticism Thant and Chang (2021) proposed is that Herzberg's theory does not require examining personnel to identify their motivation and hygiene factors. The authors also asserted that the two-factor theory lacked objectivity when assessing employee satisfaction and complicated the theory's adoption when determining employee satisfaction. Individual employee assessments are resource-intensive and complex, especially in organizations with global operations and workforce. As highlighted earlier, business entities in the 21st century have operations across continents and employ thousands of employees in hundreds of countries. Assessing individual needs to understand and resolve problems may require strategically accumulating data over time.

Engaging Followers

Engaging personnel, active involvement, and communicating with employees positively impact turnover by increasing job satisfaction and employee engagement. An emotionally intelligent leader significantly mitigates intent to leave and increases productivity (Veshne & Munshi, 2020). Some benefits of engaging personnel include (a) increased job satisfaction, (b) improved communication, (c) increased productivity, and (d) improved morale.

Job Satisfaction

Increased job satisfaction can have a significant impact on improving retention. Perceived organizational support allows supervisors to provide employees with emotional and psychological support and convey organizational commitment (Sadaf et al., 2022). Employees who feel valued and heard are more likely to be satisfied with their jobs,

which can lead to increased loyalty and commitment to the organization (Prentice, 2022; Veshne & Munshi, 2020). Engaged employees are more invested in their work and more motivated to produce high-quality work, leading to increased productivity and better outcomes for the organization. Additionally, satisfied employees tend to have a better attitude towards their work and colleagues, leading to a more positive and productive work environment. This positive work environment can create a sense of camaraderie among employees and foster a sense of loyalty to the organization (Položki Vokić et al., 2023). When employees are satisfied with their jobs, they are less likely to look for new opportunities and more likely to stay with the organization long-term, thereby reducing the cost and disruption caused by high turnover.

Improved Communication

Improved communication can have a positive impact on mitigating retention within an organization. One of the key benefits of enhanced communication is that it promotes transparency and trust within the organization (Verčič, 2021). The organization benefits when employees feel leaders are accountable, hold them responsible, and express value in contributing opinions and ideas (Joplin et al., 2021). Clear and effective communication can help to prevent misunderstandings and conflicts from arising. Engaging followers via communication keeps employees informed and serves as a conduit to establish trust among supervisors and colleagues, creating a more positive and productive work environment.

Increased Productivity

Engaged employees are more motivated to work and produce high-quality work, which can lead to increased productivity and better outcomes for the organization (Prentice, 2022; Veshne & Munshi, 2020). Leaders rely on the benefits of productivity to sustain an organization. Personnel understand it is their responsibility to do their job, and increased productivity displays job satisfaction and psychological well-being (Al Aina & Atan, 2020). Another benefit of increased productivity is improving customer satisfaction and employee morale.

Improved Morale

Whether an organization traditionally works in an office space or remotely, morale is a significant factor. Obeng et al. (2021) maintained that employee morale contributes to high-performance work practices and mitigates turnover intention. Employee engagement enables effective communication and allows individualized attention to satisfiers (motivators) to create a culture and a work environment conducive to job satisfaction and employee commitment (Arici et al., 2023; Chanana & Sangeeta, 2020). Last, leaders with a positive outlook exhibit emotional intelligence and express what they want to see in others.

Employee Turnover

The increasing complexity and dynamism of the global business environment have caused business entities to pursue measures and policies to keep employees. While standards and guidelines may prove successful for some firms, others have fallen victim to looming turnover and decreased productivity. Zimmerman et al. (2018) defined

employee turnover as a situation in which an employee departs from an organization, negatively affecting its expenditure and ability to distribute its products and services. Employee turnover is far-reaching and can affect personnel and operations on multiple levels.

While internal organizational challenges and external economic challenges influence employee turnover, there are personal factors that also require evaluation. Skelton et al. (2019) found that the main reasons for turnover were age, education levels, marital status, experience, and gender. Female employees recorded higher levels of turnover than their male counterparts, given that some families are structured where women are the primary caregivers (Skelton et al., 2019). Young, inexperienced, and highly educated employees showed low satisfaction levels, thereby possessing lower commitment levels, leading to higher turnover, and older and experienced employees desired a career path influenced by their life choices (Holston-Okae & Mushi, 2018). As indicated, personnel desires are varied and require an attentive leader capable of identifying individual and internal factors that may mitigate intent to leave. Internal factors that influence turnover may include (a) knowledge, skills, and abilities (KSAs), (b) growth and development, (c) compensation, and (d) organizational involvement.

Knowledge, Skills, and Abilities (KSAs)

Aptitude is a significant factor in an employee's intent to leave. Employees needing more core competencies often fail to progress, leading to stagnation and frustration as their peers advance (Belete, 2018). In some instances, organizational policies and practices that require specific education requirements beyond requisite KSAs

may be necessary to achieve strategic goals; however, they may also contribute to turnover (Marquardson & Elnoshokaty, 2020). Developing the workforce requires establishing specific KSAs that align with realizing organizational success. Human behavior and values are also necessary when assessing and defining the organizational environment to establish KSAs and develop personnel where needed (Dawson & Thomson, 2018). Identifying KSAs that align with and contribute to organizational outcomes and personnel desires is essential in relation to employee turnover and must be noticed.

Growth and Development

Availability, quality, and opportunities for growth and development are potent determinants of job satisfaction. According to Jarupathirun and Gennaro (2018), organizations that fail to provide employees with opportunities to gain experience and improve their skills would record higher employee turnover. Generational values and requirements differ. For example, Millennials place significant importance on growing and developing to advance their careers (Casey & Vogel, 2019), while Generation X values stature and promotions over salary (Barhate & Dirani, 2022). Employees also evaluate their employers, organizational victories, and failures to gauge their short- and long-term growth (Georgescu & Herman, 2019). If an employee realizes their current employer offers no chance for growth, the search for another employer commences. It is important to note that not all professions exhibit this trend, as some organizations maintain their workforce by limiting training and growth opportunities. The trend is

typical for low-skilled employment opportunities with an oversupply of potential employees.

Compensation

In relation to Herzberg's two-factor theory, compensation falls within the category of hygiene factors. Hassan et al. (2022) opined that salaries, bonuses, and monetary recognition mitigate turnover. An employer's ability to pay wages equal to or better than its competitors may be viewed as more desirable by employees to improve their quality of life. Elsahoryi et al. (2022) identified salary and rewards as having significant psychological elements regarding job satisfaction and retention. While supervisors and leaders can influence salary and rewards, human resources strategic planning is vital to improving retention (Hassan et al., 2022). Compensation has its place when analyzing retention strategies, but it is only one of many factors to consider.

Organizational Involvement

Organizational leaders develop policies to reduce employee turnover to mitigate the time and financial burden required to recruit and train new employees. Over the last five decades, studies on employee turnover underscore the relationship between job satisfaction and employee turnover. Jarupathirun and Gennaro (2018) revealed that competitive organizations constantly embrace cost-cutting measures, including those related to human resource management. Job satisfaction is a critical determinant of employee turnover that management must consistently monitor to alleviate the loss of experienced and skilled employees (Ali & Anwar, 2021). In addition, Jarupathirun and Gennaro posited that low levels of job satisfaction and organizational commitment were

associated with higher employee turnover rates. Organizational involvement is leadership's investment and commitment to accomplishing strategic goals.

Minimizing employee turnover is manageable when the factors influencing turnover intentions are within the control of leaders and management. Unfortunately, external factors add a layer of complexity to employee intent to leave that leaders cannot proactively allay (Ali & Anwar, 2021). Evaluating economic development and labor market trends could aid organizational leaders in predicting turnover intentions and allow for planning to adjust appropriately. When economies continue to experience elevated levels of economic growth, job opportunities arise, leading to higher levels of turnover (Arvindraj & Shanmugam, 2019). Strategic planning and attentiveness to internal and external factors are essential to safeguard continuity and productivity.

Retention Strategies

Employee retention strategies refer to organization-wide policies and procedures management can employ to retain valuable and effective employees within an organization's workforce. Managers must use retention strategies that focus on increasing job satisfaction, motivation, and productivity of individuals to lessen employment challenges and address absenteeism to improve employee performance and reduce turnover (Al-Suraihi et al., 2021). Including leaders and managerial staff to establish priorities to overcome retention challenges is critical. Leaders in successful organizations appreciate the importance of maintaining their workforce due to its impact on the firm's brand, revenue, and overall productivity (Singh, 2019). Effective retention strategies include four main elements: the job, organizational culture, personal attributes, and

external factors (Singh, 2019). Intentional efforts to address those factors enable management to proactively plan for organic turnover and reduce turnover caused by job-related factors.

An influential workplace factor in employee retention is the nature of the job entrusted to the employee. Interesting or challenging work excites and empowers employees (Whysall et al., 2019). Sussman (2021) argued that managers must be willing to evaluate each job position within an organization to outline employees' responsibilities in achieving the firm's strategic goals. Therefore, employee retention must begin with hiring practices and include a supportive culture and leader engagement.

Hiring Practices

Leaders and managers are vested in hiring employees best suited to fill vacancies. However, leaders and managers need help assessing KSAs based on resume data and the interview process (Sussman, 2021). Anchoring hiring processes to the external market and organizational needs allows management to evaluate prospective employees' ability to contribute to the organization. Bastian et al. (2020) suggested strategic planning and optimization when identifying work roles and position requirements to inform hiring initiatives. Turnover is expected; however, strategic planning and hiring practices are mitigating factors.

Findings regarding the impact of hiring practices and talent management on retention are mixed and may require further exploration. For example, Al Aina and Atan (2020) investigated the effects of hiring practices on organizational performance to detrmine sustainability and performance. Al Aina and Atan used a structured

questionnaire to survey 306 managers and concluded that no significant relationship exists between talent management and retention on sustainable organizational performance and productivity. In contrast, Imam et al. (2020) found that a meaningful relationship does exist between training and developing personnel regarding sustainable organizational performance and productivity, leading to job satisfaction. Findings also showed that effective managers could sustain and improve their organizations despite resource limitations while cultivating personnel performance without managing talent.

How a company approaches recruitment plays a significant role in shaping prospective candidates' perceptions of the organization and influences their judgment on its suitability. This phenomenon is closely tied to signaling theory, wherein the recruitment process serves as a communication tool, conveying crucial information that candidates use to assess the organization and make informed decisions about their compatibility with it (Rivera, 2020). Applicants base their decision to select a job based on recruitment efforts via website data, imagery, and recruitment behavior (Hayati, 2019). For example, Hayati (2019) explored phases of the recruitment process by applying signaling theory and the elaboration likelihood model. The author then applied the elaboration likelihood model to explain how applicants select jobs based on recruiter attitudes and persuasion and hypothesized the following:

- Talent management begins at recruitment,
- The applicant may have a false impression of organizational offerings,
- Recruiters exaggerate to lure applicants, and
- Inaccurate signaling during recruitment may be detrimental to retention.

Hayati concluded that the perception of an organization and the likelihood of enjoying employment starts with an organization's website presentation and ends with face-to-face interaction with recruiters. Overselling an organization during recruitment is detrimental and can increase the likelihood of turnover (Cattermole, 2019). Therefore, employers must avoid an inflated representation of the organization to manage the expectations of applicants and present genuine recruitment efforts to mitigate retention challenges.

U.S. Army leaders allocate resources and participate in recruitment efforts to hire qualified STEM graduates. Inaccurate, incomplete, or exaggerated information advertised during U.S. Army leaders' recruitment efforts may influence STEM graduates to select cyberfocused organizations for employment. Management teams must continuously assess metrics that define the organization's level of productivity post-hiring to ensure they align with personnel's technical requirements and aptitude with organizational needs (Dawson & Thomson, 2018). Missteps during the hiring process may lead to work role misalignment, which could be detrimental to achieving a shared understanding among the workforce regarding responsibilities, expectations, and organizational needs, which may promote turnover.

Supportive Culture

While the premise of this study focused on the role of supervisors related to employee retention, supportive organizational culture, or lack thereof, must be considered. As such, organizational culture affects leadership attitudes and decision-making. Organizational culture contributes to leaders' ability to identify the potential for retention challenges and plays a vital role in helping leaders predict turnover intentions.

Workplace culture refers to shared values, rules, and attitudes that personnel embrace and display in daily operations and interactions (Syahrul & Suryadi, 2021). A supportive culture enhances work quality and consistently increases job satisfaction (Tao & Campbell, 2020). Culture affects how employees interact with stakeholders, handle arising challenges in the workplace, and manage relations amongst themselves.

Organizational culture impacts employee outcomes and leadership responses. For instance, organizational culture significantly influences personnel timeliness in work completion, personnel efficacy, and leaders as time management role models (Paais & Pattiruhu, 2020). Leadership abilities can positively and negatively impact organizational culture. Transformational leaders must continuously engage and invest in personnel to foster a culture where initiative and innovation are encouraged to increase job satisfaction (Virgiawan et al., 2021). Personnel collective thinking and feelings toward an organization and leadership shape the culture and can have lasting impacts.

Leader Engagement

A management team's understanding of the criticality of employee engagement is invaluable. Through leader engagement, employees feel empowered to lead and contribute (Brewington & Darko, 2020). Leaders' active participation in personnel and organizational well-being facilitates relationship building and establishes trust. Osborne and Mohamad (2017) found that recognition and rewards directly influenced performance, were vital in communicating approval, and served as feedback. In addition, the authors asserted that salary was essential to personnel; however, stability and benefits were more important in some cases. Effective communication and individualized leader

attention to satisfiers (motivators) create a culture and work environment conducive to job satisfaction, employee engagement, and employee commitment.

Leadership availability and willingness to invest in personnel are impactful. Personnel perception of organizational support and leader engagement increase when leaders display concern for personnel's welfare and professional development (Andriyanti & Supartha, 2021; Sopiah et al., 2020). Jarupathirun and Gennaro (2018) recommended that management teams continuously examine work-related variables concerning each employee to address workplace schedules, task variety, the number of hours spent at work, and the autonomy and complexity of tasks assigned. Genuine concern, relationship building, and individualized strategies infer and demonstrate leader engagement and lead to reduced turnover.

Turnover and Retention in the Department of Defense

Leaders require foresight to plan for and mitigate retention when possible. In a posture statement by General Nakasone (2021), recruiting and retention are critical in the U.S. Armed Forces, causing leaders to establish programs and incentives aimed at competing with the private sector. General Nakasone also reported that U.S. Cyber Command's operating budget, which included manning, exceeded $600 million in 2021. Cyber operations and cybersecurity are fundamental to the country's success at every level. Resolving or mitigating retention is vital to DoD maintaining a competitive edge.

Evaluating defensive cyber work roles and successes offered insight into leadership and clarified criteria to help influence change. Dawson and Thomson (2018) aimed to enhance existing research by pinpointing the requirements for civilian roles in

defensive cyber operations. They achieved this by identifying skill gaps, defining cyberrelated terminology, and delineating limitations and foundational Knowledge, Skills, and Abilities (KSAs). Clarifying work roles becomes crucial when determining the KSAs for a particular job, which may sometimes require additional education or certifications. A misalignment between position descriptions and organizational objectives can result in mission failure and heightened turnover, as Zhenjing et al. (2022) highlighted. The cyber workforce requires a reassessment to ensure alignment between personnel's technical requirements and aptitude and organizational needs, as proposed by Dawson and Thomson (2018). Leaders and supervisors must stay abreast of the constantly evolving landscape in cybersecurity and allocate time to address or plan for turnover.

Cyber; Science, Technology, Engineering, and Math; and the Department of Defense

The information environment within which cyberspace operates has evolved significantly over the last three centuries. The cyber revolution commenced with the invention of the telegraph in the mid-19th century (Li & Liu, 2021) and has evolved exponentially. The term *cyberspace* became synonymous with real-time information sharing in the early 21st century as organizations sought new avenues of growth (Guo et al., 2020). The U.S. military and government entities heavily rely on cyberspace for protection and business functionalities. Presidents Biden, Obama, and Trump understood the criticality of cyber operations and cybersecurity and mandated the DoD to protect

American citizens and U.S. interests from cyber threats emanating from internal and external actors.

In exploring strategies to maintain an effective workforce in cyberfocused organizations within the U.S. Army, one must define and understand cyber, its importance, and its relation to the Army. While several definitions exist, the U.S. Department of Commerce National Institute of Standards and Technology defined cyberspace as a global network of unified infrastructure that includes the internet and internet-related devices such as telecommunications networks and systems (Committee on National Security Systems, 2015; National Institute of Standards and Technology, 2021). The intricacies, importance, and political nature of cyberspace require a human element capable of innovativeness and decision-making. Evaluating the role of the human component of U.S. Army cyberfocused organizations will require the same to attract and retain adequate, qualified cyber personnel.

With the advancement of information technology solutions, everyday life activities require an aspect of cyber, from banking, medical care, home security, and the operation of motor vehicles. From an organizational perspective, cyberspace provides a convenient medium to communicate, store, transport, and analyze information within seconds (Guo et al., 2020). Cyberspace also connects organizations and consumers dispersed globally, thereby increasing social and business links (Schneider, 2020). Overreliance on cyberspace has created a demand for professionals with the education and abilities to sustain and secure operations and processes in the private and public sectors, creating a demand in a field with documented shortages. Cyberspace allows

business entities to evaluate volumes of data needed to inform real-time and future decisions.

The role of the DoD as related to cyberspace inherently implies securing information, addressing vulnerabilities, and preparing for combatting cyberwarfare. Atrews (2020) defined cyberwarfare as using computer science technologies to attack individuals, groups, organizations, or nations. Threat actors have advanced their capabilities, making it impossible to prevent malicious intentions completely. Threats to U.S. interests are abundant. Hacktivists, multinational corporations, and nation-state actors working collectively and independently threaten the country's information environment daily, ranging from small-scale acts to sophisticated programs (Lopez, 2022). Schneider (2020) observed that espionage, disruption of crucial infrastructure, propaganda, and defacement of websites are among the existential threats to the U.S. via cyberspace.

For this reason, the U.S. government mandated the DoD to lead in guarding the country's cyberspace resources. Atrews (2020) also emphasized that the danger of cyberwarfare is due to the potential of cyberattacks to disrupt power grids, affect economies, and cause political unrest. In countering cyberattacks, the DoD must ensure stable infrastructures and remain postured to respond to and defend against various attack methods (Reeder & Hall, 2021). Within the context of the threat of cyberattack, the DoD serves to protect and defend the United States against foreign and domestic cyber threats, and the role of cybersecurity personnel in cyberfocused organizations is critical to that mission.

In cyberfocused organizations, leaders must first identify the criticality of obtaining a diverse workforce and ensure that identified skills align with job position descriptions. In 2019, General Nakasone identified STEM graduates as ideal for supporting cyber operations. In addition, Harcey et al. (2021) posited that every aspect of STEM is utilized within cyber and is the ideal field to target. To make that determination, data from the American Community Survey, beginning in 2014 and ending in 2018, was used to investigate the association between military service, race/ethnicity, and gender with STEM graduates (Harcey et al., 2021). Recruitment of such personnel and integration into cyberfocused organizations impacts the contribution of cyberrelated missions and work roles within the Army, other DoD organizations, and private organizations that work with and for the government (Biden, 2023a). Their research supports the criticality of diversity inclusion and the importance of reintegrating veterans within civilian cohorts of cyberfocused organizations. Diversity among personnel and the varied abilities they contribute to the workforce produce positive impacts to address new challenges.

Although research is limited regarding STEM within the DoD, researchers continue to explore this topic in U.S. military branches beyond the Army. Such studies and findings are critical to assess potential implications for the present study. For instance, Dwyer et al. (2020) conducted a mixed-method study to examine and explore the cause of STEM personnel retention challenges within the DoD. To gain a holistic viewpoint, Dwyer et al. conducted workshops, compiled data from universities and OPM, and surveyed 27 participants, including the private sector, DoD civilians, and military

participants. The critical function of OPM is to provide human resources and management services to aid organizations in meeting strategic goals (OPM, n.d.-a). While OPM guidance and oversight are vital, organizational leaders and supervisors bear the most significant responsibility regarding retention as they possess firsthand knowledge and expertise to identify organizational needs and gaps.

When gaps and failures relating to retention processes exist, organization leaders and supervisors are responsible (Tamunomiebi & Okwakpam, 2019), and the efforts of OPM are futile. The authors' most significant discovery revealed that jobs with STEM requirements did not require STEM degrees and, in some cases, minimal STEM-*related* KSAs, resulting in the underutilization of personnel. With the increased demand, continuous downsizing, budget cuts, STEM personnel shortages, and options to employ personnel with aptitude or comparable certifications, decision-makers must consider the alternatives and use creative methods to fill cyber work roles.

Sister services also need help with retaining cyber professionals. Ramsey (2020), a Marine Corps Cyber Protection Team leader, explored talent management challenges and provided a personal perspective which included the following:

- Expectations as a cyber professional in the Marine Corps do not align with the expectations of the service members,
- DoD salary caps make it challenging to keep cyber professionals with credentials and training desired in the private sector,
- Civilians with STEM degrees and related certifications are needed to supplement military cohorts, and

- There is little incentive for civilians with STEM degrees to continue working for the DoD with the increasing demand and salary benefits available in private industry.

Moreover, the misalignment of individual expectations with organizational needs negatively impacted job satisfaction (Ramsey, 2020). Although conducted in the context of the Marine Corps, Ramsey offered firsthand knowledge and experience from the supervisor's perspective in a cyberfocused organization, emphasizing the importance of the civilian work role and flexibility needed to retain talent. When supervisors align education requirements or KSAs with organizational needs, turnover is reduced exponentially (Chavadi et al., 2021). The issue of maintaining personnel with STEM degrees is an issue that has prevailed throughout the DoD.

While ongoing personnel shortages in STEM graduates exist, an increased demand for STEM personnel remains. Stewart and Agrawal (2021) examined the reasons for requiring STEM degrees for certain active-duty positions within the U.S. Air Force (USAF) and United States Space Force (USSF). The study revealed that the demand for personnel with STEM degrees excluded a large and diverse group of potential officers within specific fields. For instance, personnel require a STEM degree within the Air Force's cyber operations, thereby reducing the potential pool of candidates for cybersecurity positions (Stewart & Agrawal, 2021). Organizational learning is driven by employing a diverse workforce (De Toni & Pessot, 2021). An emphasis on STEM degrees among active-duty personnel could potentially fill gaps in STEM shortages among the civilian cohorts.

An overemphasis on STEM also impacts the Air Force in the areas of diversity and availability. The demographic makeup of the STEM fields also lacks diversity regarding the underrepresentation of women and Black and Hispanic individuals (Stewart & Agrawal, 2021). This lack of diversity limits the range of perspectives and experiences in STEM fields. Study findings indicated that multigenerational workforce motivators significantly overlap with more commonalities than differences (Heyns & Kerr, 2018). Diversity leads to the development of essential skills, increases innovation, and improves organizational learning, which is critical for completing complex projects (De Toni & Pessot, 2021). In addition, Air Force leaders face continued challenges attaining the necessary amount of personnel as prescribed in official guidelines. DoD leaders expect this trend to continue as the demand for officers with STEM backgrounds in cyber increases, reducing the pool of eligible candidates. These issues are central to retaining STEM personnel within the DoD. The realization of STEM retention challenges in the Marines parallels personnel shortages in the DoD-Army, which may be self-imposed by poorly written job requirements.

Transition

Section 1 included literature relevant to the current topic. As demonstrated, scholars have utilized the selected theoretical underpinning – Herzberg's (1965) two-factor theory – in exploring employee outcomes, including employee retention and turnover. Additionally, academics published literature documenting a lack of qualified STEM candidates to fill in-demand positions. For this reason, the current topic of STEM employee retention in a cyberfocused organization within the DoD is relevant and is an

area where further research is needed. In addition, the nature of the study, including the population of interest developed for this study, and the significance of this research were included in the discussion.

Section 2 aims to provide further details regarding the project, including the study's purpose, the researcher's role, participant criteria, research methodology, and design. Also provided are details about the project and a description of this study's data collection and analysis plan. Section 3 will include a presentation and interpretation of findings, the implication for social change, recommendations, and research conclusion.

Section 2: The Project

Section 2 includes the role of the researcher, research method, and research design. The goal is to also expound on participant eligibility criteria, sampling technique, data collection process, data organization, and data analysis procedures. Last, I include ethical considerations and mitigation efforts to ensure data reliability and validity to determine the nature and extent of relationships among constructs in the project.

Purpose Statement

The purpose of this qualitative single case study was to explore strategies U.S. Army supervisors in the southeastern region of the United States use to retain civilian personnel with computer science STEM-related degrees, focusing on a single DoD (Army) organization.

Role of the Researcher

The primary role of the researcher in a qualitative study is to elicit relevant information, thoughts, and feelings from a targeted population to answer the research question (Prosek & Gibson, 2021; Yin, 2018). The researcher is the primary data collector and must, as objectively as possible, responsibly contribute to the profession by complying with social obligations and applicable codes of conduct governing their research field (Burles & Bally, 2018). I was close to the research problem in this qualitative research and had firsthand knowledge and experience with retention challenges and effects. In keeping with the principles of the Belmont Report, I adhered to data collection protocols to mitigate personal bias. The application of protocols allows for transparency, bias mitigation, and increased research rigor (J. R. I. Williams et al., 2021).

Data were collected via semistructured interviews followed by an objective presentation of ethically driven and informed findings.

Data collection methods and safeguarding principles are critical aspects of research. As the researcher is the primary data collection instrument, documenting interactions with participants plays an active role in shaping the research process and establishing trustworthiness with consumers and data contributors (Johnson et al., 2020). In addition, documenting and maintaining an audit trail throughout the research process is essential. This trail includes recording decisions made, changes implemented, and any challenges met throughout the research process (Carcary, 2020). By keeping a comprehensive record of the research process, researchers can demonstrate transparency and enable scrutiny of their work, reducing the likelihood of personal bias going unnoticed.

The Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) serves as a framework for protecting the rights and welfare of participants in research studies. The Belmont Report highlights three ethical principles: respect for participants, beneficence, and justice. As a researcher committed to upholding ethical standards, I had the goal of diligently applying the three ethical principles of the Belmont Report to protect the rights and well-being of research participants.

First, the principle of respect for persons as a cornerstone of ethical research was recognized and honored. Respect for persons involves ensuring that participants have full autonomy to decide whether they would like to take part or decline to participate at any

point without retribution (Shaw et al., 2019). Participants received the consent agreement and information regarding the research objectives, procedures, potential risks, and benefits via email from my Walden University account. The voluntary nature of participation was emphasized to participants to ensure that they understood that they were not bound to continue and could end participation at any point during the process. In addition, respecting participants' privacy and confidentiality was paramount. To honor privacy and confidentiality, a robust data security measure was implemented to protect personal information.

The principle of beneficence guided my research practices. Benevolence, in brief, means to avoid harm (Favaretto et al., 2020). Before starting this study, the Walden Institutional Review Board, the Army Human Research Protections Office (AHRPO, n.d.), and I conducted a meticulous risk-benefit analysis, carefully evaluating potential risks associated with participation. To maximize benefits and minimize harm, protocols and rigorous monitoring systems were implemented to address any adverse effects on participants promptly. Furthermore, an assessment was made to ensure that the potential benefits of the research outweighed any foreseeable risks.

Last, the principle of justice informed my approach to participant protection. According to the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979), justice refers to equitable fairness. When selecting participants, the Belmont Report indicates that the researcher must apply fair and justifiable criteria to avoid discrimination or bias. Participant selection included diverse individuals, particularly those best suited to contribute to

research findings while promoting inclusivity. Vigilance was vital when considering the potential impact of the research on vulnerable populations. To protect the rights and welfare of participants, added measures were needed to mitigate any unintended exacerbation of existing inequities.

Personal knowledge of the problem creates a potential for personal bias. Personal bias refers to the researcher's limitations that may negatively affect the research outcome and deny the targeted industry or field useful study information (Roberts, 2020). To mitigate viewing data through a personal lens, I acknowledged the inherent biases and subjectivity that could have influenced data interpretation. In addition, implementation included the following:

- I practiced reflexivity to consciously set aside personal beliefs and preconceived notions during the data analysis process.
- I engaged in critical thinking and sought diverse perspectives through collaboration with peers, member checking, and consultation with advisors and experts in the field.
- I maintained consistency and transparency by documenting the research process, audio recording and transcribing interviews, and adhering to protocols.

Olmos-Vega et al. (2023) recommended that researchers view participants as co-contributors. Regularly engaging in self-reflection and introspection to examine biases and assumptions plays a crucial role in minimizing the influence of personal perspectives on data interpretation.

Participants

Selected participants included U.S. Army supervisors with at least 5 years of experience related to hiring, managing, and retaining personnel in a cyberfocused organization. The narrow scope of the research problem and the limited population available to contribute to this study did not allow for random or probability sampling. In a qualitative single case study, the researcher needs to consider the specific knowledge or experience of participants to determine the criteria, the research question, the research method, and the research design (Campbell et al., 2020). Study participants had firsthand knowledge of retention challenges and their organizational impact. To best answer the research question, participant eligibility criteria included personnel in supervisory positions with longevity in the role and organization. The criteria also required participants to have subordinates with STEM-related degrees, firsthand experience in developing retention strategies, and familiarity with the impact of personnel shortages or frequent turnover.

A partnership with a cyberfocused organization was established to gain access to participants. Leadership approval to access personnel and internal information was vital to answer the research question. I used purposive sampling techniques based on specific criteria related to the research objectives to identify potential participants. Researchers use purposive sampling to increase the depth of understanding, allowing them to select participants most likely to produce helpful information (Berndt, 2020). I integrated ethical considerations, such as obtaining leader approval for the chosen organization,

gaining participant informed consent, and conducting interviews in the place of the participants' choosing to ensure privacy and confidentiality.

Establishing positive relationships with study participants was vital to gaining access to firsthand experiences to address the research question. To establish rapport, the purpose and significance of the study were communicated to ensure that participants understood how their involvement contributed to the research. In addition, contact information was provided to allow for accessibility to address questions and concerns or receive declinations to continue participation. Building trust through open and honest communication is necessary to make participants feel safe (Roberts, 2020). Active listening showed empathy and created a nonjudgmental environment to encourage participants to freely share their thoughts (Lavee & Itzchakov, 2021). During the research process, participants received updates on the study's progress, and gratitude was expressed to ensure that participants felt valued and acknowledged. Last, I was responsive and available for any questions or concerns and promptly addressed them to foster a collaborative and supportive environment that encouraged and facilitated engagement and cooperation.

Research Method and Design

This study used the qualitative research methodology coupled with a single case study research design to best answer the research question. Ahmad et al. (2019) stated that researchers use quantitative, qualitative, and mixed methods to conduct studies. The choice of research method was influenced by the data required to answer the research question. A qualitative research methodology allows the researcher to explore

phenomena using semistructured interviews, historical data, and observations (Haven & Van Grootel, 2019). This study included semistructured interviews as well as organizational and historical data. A single case study research design was appropriate for this study. According to Yin (2018), single case studies allow the researcher to explore an organizational phenomenon based on social interactions. A qualitative single case study facilitated a better understanding of enduring challenges regarding retention based on the perceptions of a small group of participants.

Research Method

A qualitative research methodology was applied because participants' perspective was critical to answering the research question. Qualitative research methodology captures participants' experiences and in-depth understanding of a subject (Ahmad et al., 2019; Burles & Bally, 2018). To best answer the research question, participants needed experience with challenges regarding retention and its impacts to contribute to the study positively. The essence of conducting scientific research studies is to classify the respondents' accounts of a phenomenon, which generates experiential descriptions (Mackieson et al., 2018). Conducting qualitative research will also allow the researcher to capture subjective information and let participants to describe their attitudes, beliefs, and perceptions regarding the research problem (Rose & Johnson, 2020). The qualitative method for this study was chosen based on the need to gain an increased understanding of retention strategies in a niche field. Using qualitative methods helped identify trends to conduct thematic analysis and answer the research questions.

The quantitative research method needs more participant interactions to gain perspectives that can only be achieved when establishing rapport. Unlike the qualitative method, the quantitative method excludes participant and researcher interaction and relies strictly on objective statistics to evaluate a hypothesis (Bloomfield & Fisher, 2019). Researchers use quantitative methods to build on positivist epistemological perspectives that embrace theoretical frameworks in formulating and testing hypotheses (Borgstede & Scholz, 2021). The rigidity of quantitative research, which entails collecting and analyzing numerical data to find patterns and generalize findings in large populations, is inadequate to capture data needed to answer the research question. Ahmad et al. (2019) opined that quantitative researchers conduct systematic investigations of phenomena by gathering quantifiable data and performing statistical or computational techniques. Using the quantitative method was not applicable because this study did not include evaluating a hypothesis.

Mixed method research did not apply because it entails using quantitative methods. Mixed method studies require a combination of qualitative and quantitative approaches to collect, analyze, and interpret the research data (Dawadi et al., 2021). Mixed methods research offers a better understanding of phenomena investigation as the approach integrates the benefits of qualitative and quantitative methods when one method is insufficient to answer the research question. Borgstede and Scholz (2021) opined that researchers embrace the mixed method to increase the generalizability of their studies, improve contextualization, and enhance the credibility of their research findings. Mixed method research benefits researchers who aim to design and test theories while

conducting inductive and deductive analysis in their studies (Cheng et al., 2022). In this study, I aimed to explore supervisors' experiences and perspectives and did not include theory building, testing hypotheses, or evaluating relationships between variables.

Research Design

Considered were four research designs to complement the research method: phenomenology, historical research, grounded theory, and case study. A case study research design was best suited to this study. In qualitative research, case studies allow the researcher to focus on exploring, understanding, and describing the subject phenomena in a real-world setting by asking "what" or "how" questions (Alam, 2021; Yin, 2018). A case study design also allows for the inclusion of multiple information sources to add context layers to address the phenomenon (Çakar & Aykol, 2023), such as artifacts and secondary data (Ahmad et al., 2019). In the selected cyberfocused organization, the participant pool was scant. Using a case study research design is best when the collection of participants is limited to yield generalizable results (Yin, 2018), allowing for the exploration of retention practices within a unique setting. To add perspective, information derived from secondary data included organizational policies, training guides, and historical data.

The phenomenological research design is an effective approach in studies, yet it was unsuitable for this study. Phenomenology aims to uncover the essence of human experiences, exploring the meanings and structures that individuals ascribe to their lived realities (Neubauer et al., 2019). This approach is particularly valuable when capturing the essence of things from a philosophical perspective (van Manen & van Manen, 2021).

I did not use a phenomenological research design because participants' feelings and behaviors did not apply to the research problem.

Researchers relying on a historical research design collect data from speeches, old letters, journals, diaries, legislation, artifacts, and written interviews or autobiographies. Yin (2018) opined that the historical research approach allows researchers to gather, verify, and integrate data from the past to gain a deeper understanding of the past and use the same to defend or refute historical hypotheses. While historical research might have been useful, it was inadequate as a standalone source as the data regarding events and processes were outdated. The historical research design was not a suitable option because exploration of the phenomena required current information to answer the research question.

Researchers also use grounded theory design in qualitative studies. Birks et al. (2019) opined that grounded research design allows the researcher to construct theories that are grounded in systematically collected data. While grounded theory design is flexible and beneficial to inexperienced researchers, it is used when information regarding a phenomenon is limited (Chun Tie et al., 2019). Using the grounded theory design did not apply to this study because the core objective did not entail developing new theories.

I conducted interviews and document analysis to ensure data saturation until no new information or insights were obtained and data redundancy was reached. Iterative data collection and analysis processes allow for ongoing refinement and identification of data gaps, ensuring that all relevant aspects of the case are explored (Mwita, 2022). A

diverse and purposive sampling strategy was employed, which included a range of perspectives and experiences related to the research question to gain a comprehensive understanding of the phenomenon. Additionally, the triangulation of data from multiple sources, such as interviews, peer-reviewed literature, and historical documents, enhanced the richness and depth of data to mitigate missing critical information. Continuous engagement with the data, such as coding, categorizing, and analyzing the information, aids in identifying emerging themes, patterns, and discrepancies, further contributing to data saturation (Gill, 2020). Regular consultation with research advisors, peers (familiar and unfamiliar with the topic), and member checking provided valuable insight and feedback, validating data saturation.

Population and Sampling

The selected population for this study was U.S. Army supervisors with at least 5 years of experience in hiring, managing, and retaining personnel in a cyberfocused organization in the southeastern region of the United States. Analytical generalizations for qualitative studies require small sample sizes (Yin, 2018). The participant pool was limited; therefore, the selection included participants via purposive sampling. The following three criteria for the targeted population were developed: (a) management position, (b) 5 years of experience, and (c) involvement in developing strategies to retain employees with STEM-related degrees. Purposive sampling allowed for selecting participants close to the subject and most likely to yield data conducive to addressing the phenomena (Campbell et al., 2020). The tentative sample size was four to five supervisors of personnel with STEM-related degrees. Purposive sampling is a

nonprobability sampling method that allows for adequate representation in instances where the participant pool is limited (Bougie & Sekaran, 2020). Purposive sampling improves rigor and trustworthiness while enhancing the data's credibility, transferability, and dependability (Goodman et al., 2020; Johnson et al., 2020). Random and snowball sampling were not ideal as they would have resulted in the selection of participants without knowledge or understanding of the research topic.

Random sampling was not applicable because it would not allow for collection of data relevant to the research problem. Random sampling involves selecting participants from a broad population (Obilor, 2023). General population participants would not have access or expertise to contribute. Researchers use snowball sampling to help achieve data saturation and as a recruiting tool when the researcher has limited access to participants (Leighton et al., 2021). Access to participants was not an issue; the criteria for participants were narrow in scope, and the participant pool was small.

Achieving data saturation contributes to research rigor. Data saturation requires the researcher to continue collecting data until enough information is attained to reproduce the research and new data or coding themes emerge (Gill, 2020). Data saturation is a sign of information validity and is a critical criterion in qualitative research (Hennink & Kaiser, 2019). The intended sample size was four to five participants; however, I reached data saturation with four participants. While interviewing the third participant, responses became repetitive, and the fourth participant confirmed and validated that no additional information was obtainable. Participant selections included personnel employed in the organization for over 10 years who possessed historical

knowledge and firsthand experience with supervision and retention challenges of STEM personnel. These participants were also actively involved with writing procedures to develop organizational solutions and contributed to developing policy for a long-term solution to lessen the wage gap.

The interview setting was critical due to close work proximity, limited participants within the specified criteria, and participant familiarity with one another. Researcher rapport in establishing protective measures for participants creates a safe space to divulge information that may threaten their well-being or livelihood (Kamanzi et al., 2019). Participants selected the interview site; however, it had to be away from their work locations to maintain privacy and confidentiality. Allowing participants a choice empowers them to select a place they consider most convenient and comfortable (Bjørvik et al., 2023). All participant data are saved on a password-protected external drive, and participants are identified by pseudonyms (P1, P2, etc.) during interview recording and transcriptions. Reaching information confidentiality is a layered process that includes removing identifiable information from stored files, password protection, and encryption (Lobe et al., 2020). To answer the research question, the researcher must apply equal protection standards regarding participants and information.

Ethical Research

The study addressed all ethical principles and requirements during the research process, which included obtaining Walden Institutional Review Board approval (06-23-23-1062319). In addition, I used protocols outlined within Walden University's research guidelines and the Belmont Report (National Commission for the Protection of Human

Subjects of Biomedical and Behavioral Research, 1979). While the onus to ensure ethical principles lies with the researcher, Walden University and the AHRPO also provided oversight to protect participants' rights and well-being.

Participation in this study was strictly voluntary. Participant free will in a study is essential to applying ethical principles and research utility to the field (White, 2020). Yin (2018) proposed that researchers require participants to sign consent forms before engaging in interviews. Informed consent includes knowledge, comprehension, and voluntariness identified in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Before conducting interviews, participants received the consent agreement statement, the purpose of the study, procedures, risks, benefits, and my contact information via email. Walden University email was used to send consent emails to participants to mitigate influencing selectees' decision to continue, as my role was not that of a DoD employee. Using a consent agreement provides transparency to the participants regarding the nature of the study and their role and guarantees consistency in the information presented (Thunberg & Arnell, 2021; Xu et al., 2020). In addition, participants reconfirmed their willingness to continue at the beginning of interviews.

The U.S. Army is not a business; however, challenges remain a concern. Completing this study required contributions from U.S. Army personnel and, therefore, necessary approval and oversight from the AHRPO (n.d.), including a memorandum from the participating organization's leadership granting permission to access personnel and documents. AHRPO inclusion is critical when Army personnel are the subject matter for

research or when research is conducted on an Army installation. An AHRPO representative reviewed this study to protect participants and the affiliated organization, which also aligned with the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Upholding ethical principles ensures the credibility of the data collected and subsequent research findings (Rashid et al., 2019). When researchers place themselves within the research to develop and implement ethically driven practices, they achieve better results (Xu et al., 2020). Participation in this study was voluntary. Incentives were not offered at any point during this study. As the researcher and a U.S. Army employee, I applied requisite protection standards and ethical practices to safeguard data, participants, and the organization.

While participants are leaders, supervisors, and decision-makers, they still require protection. The researcher is accountable and obligated to the reader and the field of study to implement established mitigation guidelines, including protecting the data and participants (Bougie & Sekaran, 2020; Yin, 2018). Maintaining confidentiality is of the utmost importance. Ensuring confidentiality allows participants a level of comfort to contribute honestly and strengthens research rigor (Badampudi et al., 2022). The guiding principle of the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) was upheld to ensure participant data remained confidential by assigning alphanumeric pseudonyms instead of names or other identifying information. After 5 years, I will delete all research data.

Data Collection Instruments

For this study, I was the primary data collection instrument. As the data collection instrument, establishing rapport and trust is paramount when collecting data surrounding firsthand experiences and perspectives (Soh et al., 2020). The data collection process entailed semistructured interview questions. According to Yin (2018), semistructured interviews allow the researcher to gain an in-depth understanding of the participants' views while also making it easy to address follow-up questions that may arise. Using semistructured interviews was ideal for this study because the focus included a single organization with a small participant pool.

As the primary data collection instrument, an interview protocol (see Appendix) was used to maintain consistency. Braaten et al. (2020) posited that using an interview protocol allows participants to understand layered or convoluted questions in a concise, clear manner and adds quality. In addition to semistructured interviews, secondary data were also used, which included government reports and information (available via open-source data) and the following, per approval by leadership from the contributing organization, with redactions where required to maintain organization and personnel confidentiality:

- training materials (organizational training guides);
- polices/memorandums (organizational practices, procedures, and authorizations); and
- reports (internal retention statistics, exit interview data)

Alam (2021) recommended that the researcher collect data from multiple sources to expand understanding. Data collection is critical to research outcomes; however, more than sole source data collection may be required to conduct a thorough analysis.

Ensuring the reliability and validity of data collection instruments and processes is paramount in qualitative studies. Reliability refers to the consistency and stability of the data collection instrument, while validity refers to the accuracy and credibility of the instrument in measuring what it intends to measure (Coleman, 2021; Lincoln & Guba, 1985; Nassaji, 2020). C. T. Williams-McBean (2019) asserted that piloting the data collection instrument with a subset of participants to identify potential issues or areas for improvement is also helpful. Instead of a pilot study, member checking was conducted to validate and confirm the completeness and accuracy of information. Member checking is a process that allows the researcher to establish information validity by allowing participants to review preliminary analysis (Lincoln & Guba, 1985). Study participants were co-contributors and not merely sources of data; they validated data and were instrumental in reaching data saturation. I also engaged study participants, colleagues, and other subject-matter experts (SMEs), such as human resources and force management supervisors, in iterative dialogue to gain new perspectives.

To ensure the reliability and validity of data collection, clear and explicit procedures and protocols for data collection were established to guide me throughout the study. Established processes and protocols included an interview protocol, documenting method, interview recording, transcriptions, and member checking. Furthermore, the study included the use of triangulation to bolster data collection. Triangulation involves

using multiple sources or methods to cross-validate findings, thereby reducing the risk of relying on a sole source of data to examine the same phenomenon (Bans-Akutey & Tiimub, 2021; Yin, 2018).

Last, I used reflexivity to address potential researcher bias and mitigate viewing data through a personal lens. Reflexivity involves regularly reflecting on the researcher's assumptions, biases, and influence on the data collection process Rose and Johnson (2020). By critically examining and acknowledging my positionality, I minimized the impact of subjective perspectives on data collection and increased the reliability and validity of the study. Incorporating incomplete or inaccurate data is futile and does not positively contribute to the field of study.

Data Collection Technique

The appropriate data collection technique for this study is semistructured, face-to-face interviews. Using semistructured interviews allows the researchers to ask open-ended questions that provide more details than closed-ended questions (Brown & Danaher, 2019). In qualitative studies, researchers may gather data from documents, interviews, and observations (Tomaszewski et al., 2020). In addition to semistructured interviews, data derived from current organizational policies and practices were used. Using current and archived material will aid in triangulating data to enhance the credibility of information collected during interviews (FitzPatrick, 2019). Compiling data from multiple sources allows the researcher to thoroughly explore the phenomenon and substantiate findings (Yin, 2018). Last, I used member checking to validate the initial

analysis. The use of triangulation helped gain a better understanding of the different perspectives of participant responses during interviews.

The study included semistructured interviews to capture participants' lived experiences; however, there were advantages and disadvantages. The most significant advantage of semistructured interviews was flexibility. The use of semistructured interviews as a data collection technique (a) allows the researcher to capture nonverbal cues (Saarijärvi & Bratt, 2021), (b) allows the researcher and participant the flexibility to clarify and expound on questions, and (c) helps the researcher elucidate the totality of participants' experiences with open-ended questions (Biasutti et al., 2022). During interviews, follow-up questions were asked to clarify, and participants did the same. The most concerning disadvantage of conducting semistructured interviews was time. Cyberfocused organizations often run at a high operational tempo. Participant work responsibilities and operational tempo resulted in scheduling conflicts, caused significant delays, and may have caused frustration for participants.

Due to operational tempo challenges, member checking was complex. Therefore, participants were contacted via email and telephone to confirm and validate (a) the accuracy of participant perspectives, (b) interpretation of data, and (c) initial analysis. Researchers can conduct member checking through various means, such as individual interviews, focus groups, or written feedback forms (Motulsky, 2021). While grasping the importance of member checking, I also ensured participants understood. The researcher should create a supportive and nonjudgmental environment during member checking to encourage open and honest participant feedback (Busetto et al., 2020). At the

end of the interviews, I explained to participants their role and importance regarding member checking and asked if they were willing and comfortable with follow-up discussions. Incorporating participant feedback into the analysis process helps the researcher validate interpretations, identify potential biases or misconceptions, and provide additional insights or nuances that may have been missed.

Data Organization Technique

Data organization included journals, digital media, and data derived from online research platforms. After data collection, documents and notes gathered during interviews, member checks, and journaling were scanned and stored on a password-protected Microsoft OneDrive cloud storage personal account. The study included using Microsoft 365 transcription software to convert audio recordings into text. Rashid et al. (2019) noted that researchers must document the process of collecting and storing research data to enhance the reliability of their studies. Each audio recording and transcribed file was named using participant pseudonyms. According to Yin (2018), researchers conducting qualitative studies that involve interviews must ensure that participant data remains confidential.

Data collection is only helpful if the researcher organizes it meaningfully. I used Microsoft Excel to conduct manual thematic coding when analyzing data to uncover overlapping themes. A clear and consistent coding system was used to identify and categorize transcript verbiage and research data to create themes. According to M. Williams and Moser (2019), thematic coding is critical to organizing topics comprehensively, allowing visual analysis. Maintaining confidentiality is directly related

to ensuring participant well-being (Kamanzi et al., 2019). Additionally, detailed data documentation, including metadata and additional notes, was kept, providing a comprehensive record of the research process. Last, backed-up data included the use of Microsoft OneDrive. At the 5-year mark, I will destroy all data.

Data Analysis

In qualitative research, confirming data validity is as essential as the data itself. Data triangulation allows the researcher to use data collected over time from various sources to comprehensively understand the research goals and outcomes (Yin, 2018). Rashid et al. (2019) posited that qualitative studies require simultaneous data collection and analysis. There are four types of triangulations used in qualitative research: (a) data, (b) researcher, (c) theory, and (d) method (Farquhar et al., 2020). I used methodological triangulation for this study, including data derived from semistructured interviews, current organizational policies and practices, and publicly available government information to achieve data saturation. Methodological triangulation adds research rigor by allowing the researcher to verify data, thereby increasing reliability and validity in qualitative studies (Biasutti et al., 2022; Farquhar et al., 2020). Methodological triangulation allows the researcher to combine primary and secondary data to increase understanding and allow for holistic analysis and reduced bias.

Post-data collection began the data analysis phase of qualitative research. This study included manual thematic coding to conceptualize, visualize, and evaluate data. Qualitative data analysis consists of five steps: compiling, disassembling, reassembling, interpreting, and concluding (Yin, 2016). First, I organized and collected data which

included interview transcripts, organization policy letters, exit interview data, and information gained from the OPM. Second, data were disassembled to find patterns or themes and coded during discovery. Theme refinement continued until core themes that best answered the research question or found gaps appeared. Developing themes helps show a methodical approach to interpreting data (Cassell & Bishop, 2019). Coding is a significant step in developing themes. Coding consists of descriptive phrases or words that allow the researcher to assign value or meaning to data (Lester et al., 2020). Next, data were reassembled to determine whether themes were valid, overlapped, or if sub-themes developed. To interpret data, I used Microsoft Excel to create a visual map to find patterns and how they related to one another, the research question, and the conceptual framework. Comparison of participant responses facilitated the development of key themes which addressed the research question. Color-coding participant responses served as a visual that corresponded with critical themes and interview questions to reflect overlapping answers that aligned with, contradicted or identified a gap in Herzberg's (1965) motivation theory. The top four themes were as follows:

1. salary and monetary incentives (hygiene and motivator factor)
2. the work itself (motivator factor)
3. individual considerations (two-factor theory gap), and
4. transactional retention (two-factor theory contradiction)

Last, with the information gathering and analysis complete, I concluded with findings to answer the research question.

A thorough analysis of the data collected included interview transcripts, literature review, journal notes of data collected from the organization's human resources liaison, and member checks to find recurring patterns and ideas. I used the most prominent themes in the research findings. Also used was the conceptual framework, which outlines the study's theoretical foundation as a reference point to align themes and concepts within. This process involved critically assessing the fit and relevance of the themes to the existing literature and conceptual framework, seeking evidence or theoretical support to confirm or refine the themes as necessary. I used the inductive approach to thematic coding. Inductive coding allows the researcher to use data generalizations based on literature, conceptual framework, and participant interviews to develop themes (Kiger & Varpio, 2020). In doing so, discovery included connections, gaps, and contradictions between themes, literature, and existing knowledge.

Reliability and Validity

Data reliability and validity are essential measures, given their impact on research findings and recommendations. Rashid et al. (2019) argued that data reliability and validity allow researchers to assess the trustworthiness of research findings. Reliability and validity should reassure the researcher and the community of interest that the research findings will help those in the field who can affect change. Lincoln and Guba (1985) presented the following principles to help qualitative researchers achieve research rigor: credibility, transferability, dependability, and confirmability. Rose and Johnson (2020) defined reliability as applying the same process throughout and validity as ensuring the accuracy of data and findings. Establishing reliability and validity gives the

research consumer confidence in the data collection instrument (the researcher) and conclusions.

Reliability

Qualitative researchers rely upon tools and processes to ensure that findings are not misleading. Nassaji (2020) defined research reliability as consistent and measurable results to generate an understanding of the phenomenon. Dependability is the hallmark of research, and the researcher must display due diligence to convince the reader that findings contribute to the field of study (Lincoln & Guba, 1985). When the data instrument *is* the researcher, the research method and framework must be transparent (Adler, 2022). This study used an interview protocol, methodical documentation, member checking, interview question validation, peer evaluation, and triangulation to maintain transparency and dependability. For example, conducting member checks allowed participants to interpret and assess initial findings, increasing information reliability. I documented every data collection, interpretation, and analysis stage to confirm reliability.

Validity

The term validity applies to quantitative and qualitative research. Validity allows qualitative researchers to confirm the reliability of tools and processes used to answer the research question (Rashid et al., 2019). To address validity, I sought viewpoints from peers and study participants via member checking. Collecting data from a diverse sampling justifies analysis and promotes research rigor (Rose & Johnson, 2020). There are two types of validity: internal and external. Internal validity is applicable when findings are indicative of the phenomenon in question within a defined setting (Quintão

& Andrade, 2020), while external validity applies when findings apply to other groups regardless of setting (Maxwell, 2021). Internal validity applies to this study as setting criteria is specific to the research question.

Credibility

The credibility of research is paramount. Nassaji (2020) posited that credibility lends data truthfulness, and the researcher must ensure a vast understanding of the research topic. To achieve credibility, the review included relevant journal articles, conducted member checks, and triangulated data to expand understanding. Aguboshim (2021) recommended the process of triangulation or using multiple methods to answer the research. After primary data collection, participants reviewed the initial analysis.

Transferability

I conducted methodical documentation to ensure transferability for future scholars to use in further research. The researcher must include an in-depth background, which allows the consumers to assess whether the findings align with the research question(s) and findings (Johnson et al., 2020). Statistical generalizations are not plausible; analytical generalizations allow the researcher to develop findings in broad terms that may apply to a large population or a specific setting (Quintão & Andrade, 2020). For this study, a large population was not available; however, a unique setting existed, which was critical to the research question. While scholars disagree on generalizations in qualitative studies, tools and processes exist to satisfy the requirement.

Confirmability

The researcher and the community of interest must have confidence in the analysis to trust the findings. Confirmability ensures that collected data supports analysis (Lincoln & Guba, 1985) and is also a mechanism for bias mitigation, research consistency, and a vital source for future research (O'Kane et al., 2021). I used established interview protocols, including follow-up questions and member checking, to ensure data confirmability. Participants interactively reviewed the analysis to confirm accuracy. Protocols, journal notes, methodical documentation, and layered sources help researchers provide confirmability (Aguboshim, 2021). Member checking allows participants to confirm, add, and correct data interpretation (Rose & Johnson, 2020). Research findings must be truthful. Overlapping processes to ensure the truth was represented in findings, which also extended to ensuring the transferability of findings, was vital.

Data Saturation

In studies with a conceptual framework, reaching data saturation is relative and is achieved when the researcher attains a thorough comprehension (Sims & Cilliers, 2023). When conducting research, the researcher will amass copious amounts of information; however, the quantity of information does not equate to data saturation. Researchers achieve data saturation by acquiring quality data until no new data emerges and sufficient data exists to allow others to replicate the research (Aguboshim, 2021; Sims & Cilliers, 2023). Qualitative researchers must conduct extensive research and use diverse resources to discover gaps and emerging themes to answer the research question.

To achieve data saturation, the data collection process was planned and executed to ensure a diverse and representative sample of participants. As I immersed myself in the data, I conducted iterative reviews and analysis to discover recurring themes, patterns, and saturation indicators, such as repetition or redundancy in participant responses. Throughout, I documented the process, challenges, and reflections to maintain an audit trail and facilitate the identification of saturation points. In addition, member checking allowed participants to provide feedback and help identify inaccuracies or gaps in the initial analysis, which aided in theme discovery. Data saturation was achieved when no new information was discoverable by diligently following these steps and ensuring methodological rigor.

Transition and Summary

Section 2 included the study's scope and the purpose statement. Also highlighted was the role of the researcher, and the criteria for selecting participants were discussed. In addition, I discussed ethical considerations and guidelines that guided the collection of data, research method and design, data collection, data organization, and analysis, as well as the reliability and validity of the data collected. In Section 3, I will present study findings and recommendations for action, further study, reflections, and conclusion.

Section 3: Application to Professional Practice and Implications for Change

Introduction

Through this qualitative single case study, I explored employee retention strategies used in a U.S. Army cyberfocused organization to retain STEM employees. I aimed to identify strategies used to retain highly technical personnel in an organization within the public sector, with limited workplace flexibilities and latitude to compensate personnel comparable to salaries and flexibilities offered in the private sector. Data collection consisted of four face-to-face interviews with U.S. Army supervisors with at least 5 years of experience related to hiring, managing, and retaining personnel in a cyberfocused organization. Participants were identified as P1, P2, P3, and P4 to maintain confidentiality. Microsoft Word was used to upload interview audio files to create transcripts. I analyzed interview transcripts, journal notes, the literature review, and the organization's internal policies and procedures. I conducted manual thematic coding, which resulted in the emergence of the following themes: (a) salary and monetary incentives, (b) the work itself, (c) individual considerations, and (d) transactional retention. Section 3 includes research findings, applications to professional practice, implications for social change, recommendations for action and further research, reflections, and a conclusion.

Presentation of the Findings

The overarching research question for this study was the following: What strategies do DoD-Army supervisors in the southeastern region of the United States use to retain civilian personnel with information technology STEM-related degrees? The

demand for STEM personnel is global, and the shortage is irrefutable (Winger et al., 2023; Zilberman & Ice, 2021). To address this challenge, DoD-Army leaders creatively find ways to compensate for lower salaries until a more reliable and sustainable solution is implemented. Although salary is a motivator and demotivator (Herzberg, 1968), supervisors view salary and monetary incentives as the most critical tools for keeping employees. Each participant acknowledged that they relied upon short-term retention strategies and expressed a positive outlook regarding the long-term solution, which is still in development—Targeted Local Market Supplement (TLMS), the long-term solution, which is a salary increase to reduce the pay gap in specific cyber work roles. Leaders used analysis based on private sector salary offerings in particular work roles to establish a market-based pay table applicable to personnel with STEM-related degrees, which align with work roles identified as positions in high demand and low supply.

Theme 1: Salary and Monetary Incentives (Hygiene and Motivator)

Participants identified monetary incentives as the most effective retention strategy in lieu of a permanent solution to minimize salary inequities between the public and private sectors. In addition, President Biden's (2023b) National Cyber Workforce and Education Strategy outlines monetary incentives and salary as course of action to address the looming issue. Leaders within the OPM (n.d.-a) are working to create a pay structure specifically for STEM degree recipients. P1 made a statement that aligned with current literature and internal practices when explaining the most effective retention strategy: "hands down, it's salary or anything related to money." The literature review shows that when individuals feel adequately compensated, they are more likely to remain committed

to their roles and organizations, reducing turnover rates (Nurlina, 2022). A competitive salary not only attracts top talent but may also help organizations keep their best employees. P2 responded in kind when speaking of money as the most receptive retention strategy: “We have the most robust award system of any organization I’ve seen within the Army and we ensure that we show our individuals that if they work hard, we not only recognize it, but we recognize it monetarily.” When asked about the most effective retention strategy, P3 responded, “Honestly, the monetary incentives because the government doesn’t pay highly to begin with. So, the more monetary incentives that we can use, we are closer to our competition as far as pay.”

Participants are authorized to give employees a maximum of 25% of their base pay as a retention incentive, based on an internal retention incentive policy letter and the OPM handbook *Human Resources Flexibilities and Authorities in the Federal Government* (n.d.-b) until TLMS is fully implemented. An approved, redacted retention incentive memorandum provided by the HR liaison which showed payment intervals and duration of the incentive confirmed the practice.

While a competitive salary might not directly motivate employees, its absence or inadequacy can lead to dissatisfaction (Herzberg, 1968). P1 offered an example of the competition and said, “they’re taking advantage of the great training opportunities we offer and the companies around the Army base are looking for people that are already trained with technical certifications we’ve given them here.” While employees seek to gratify internal factors, leaders must engage employees to gain clarity regarding preferences and requirements to address external factors, such as salary, which create an

additional barrier to uncovering the root causes of job satisfaction (Ali & Anwar, 2021). Lastly, P4 expressed concern and posited, "contractor opportunities in the area offer work from home while the company pays to set up a home office for you and substantially larger salaries are just too attractive to turn down." P2 added, "It's hard to compete with a contracting company that will allow you to work remote 100% of the time." When public sector salaries cannot compete, employees may become dissatisfied. This dissatisfaction with pay can overshadow the positive aspects of public sector work, such as job security, benefits, and the opportunity to contribute to the greater good.

During member checks, documented in journal notes, participants shared the impact of retention challenges. Participants combined interesting or varied work opportunities with incentive offerings to overcome the challenges. Each participant concluded that high turnover impeded project completion, hindered knowledge transfer, increased recruitment and training costs, and decreased overall productivity and innovation within DoD-Army organizations. In STEM fields, where specialized skills and knowledge are in high demand, salary gaps will not go unnoticed, and personnel will display signs of dissatisfaction, leading to turnover (Ali & Anwar, 2021). A leader's inability to offer competitive salaries can easily lead to disillusionment and undervaluation among employees, prompting them to seek opportunities elsewhere (Alrawahi et al., 2020). Therefore, as a hygiene factor, salary and monetary incentives were pivotal in keeping STEM talent despite job satisfaction. In addition, as supported by existing literature, participant engagement with STEM employees and an in-depth

understanding of KSAs required for cyber work roles were instrumental in their application of monetary incentives.

Engagement

To overcome the impact of retention challenges, leader engagement was critical. Leaders gain personnel's attention and motivate them to stay through constant engagement to meet individual needs. When reviewing internal organizational procedures, I learned that participants conducted quarterly counseling meetings. The counseling allowed participants to provide feedback and engage personnel beyond annual and midpoint evaluation and interaction time with employees. Consistent engagement increases transparency and builds trust (Verčič, 2021). Employee engagement did improve morale and allowed the supervisor an opportunity to reassess incentive options to mitigate morale decline and potential turnover. When employees have salary concerns, their perceptions of job satisfaction are affected (Herzberg, 1965). Study participants were transformational leaders who displayed levels of emotional intelligence, which positively impacted the people in their charge and led to achieving organizational goals. Herzberg (1968) posited that employee recognition and incentives encouraged personnel to achieve organizational goals. Recognition and rewards directly influenced performance, communicated approval, and served as feedback (Osborne & Mohamad, 2017). Emotionally intelligent leaders significantly mitigate turnover (Veshne & Munshi, 2020). Participants were cognizant of the need to not make the mistakes of others by withholding incentives simply because they were in a position to do so.

Knowledge, Skills, and Abilities (KSAs)

Participants were actively involved in establishing parameters to assess employee KSAs in STEM positions. Herzberg's (1965) study highlighted the need to match responsibilities with authority in the workplace. When leaders require specific degrees beyond KSAs, a talent pool with requisite KSAs is overlooked, which may contribute to turnover (Marquardson & Elnoshokaty, 2020). A reevaluation of cyber workforce KSAs is required to align personnel's technical requirements and aptitude with organizational needs (Dawson & Thomson, 2018). When reviewing the position descriptions for the STEM work roles, I realized that participants in this study wrote them. Participants in this study were a part of a collective who brainstormed and assessed the organizational landscape to determine which KSAs and degree requirements were best suited to achieve goals. The constant demand for STEM personnel globally may increase the feasibility for leaders to explore the employment of personnel with KSAs, aptitude, or comparable certifications to fill STEM-related cyber work roles.

Triangulation

Supervisors used salary as the leading retention strategy. Study findings align with Brewington and Darko's (2020) assertion that the issuance of monetary incentives serves as a motivator and allows supervisors to show employees that they recognize their work and its impacts on the overall mission. Despite DoD-A salary caps, participants creatively used their leadership skills to gain an advantage that helped the organization and the employees. In this study, salaries and rewards not only assuaged turnover, but also contributed to job satisfaction and the psychological well-being of personnel as

indicated in exit interviews. In addition, information derived from climate surveys showed that team morale improved when turnover decreased. Study participants not only supervised employees, but also served in leadership capacities where they influenced policy and practices to improve operations, training, professional development, and retention challenges, which included the following:

- defense performance management and appraisal and management program
- annual training guidance
- retention incentives
- professional development partnerships
- civilian workforce training and leader development
- new supervisor coaching and mentoring

When leaders take a personal interest in the needs of employees through engagement, they improve organizational culture and mitigate the likelihood of workplace toxicity (Andriyanti & Supartha, 2021). As leaders, supervisors, and employees await the publication of the TLMS salary table, a review of the organization's internal retention incentive policy showed that supervisors are permitted to continue using monetary incentives; however, retention incentives may end for positions identified as TLMS eligible (OPM Retention Incentives Ending, n.d.-c).

Theme 2: The Work Itself (Motivator)

In STEM fields, the work itself is a crucial motivator for employees. Individuals in these fields are often enthusiastic about problem-solving, innovation, and making a meaningful impact on technology and society. Herzberg (1968) argued that when

employees find their work engaging and fulfilling, it can motivate them, leading to higher job satisfaction and retention. Regarding the complexity of the work and level of education required, P1 explained,

> I'm asking somebody to work with concepts that require analytical thinking or be able to conduct deep mathematical analysis; a STEM degree is required for that. The technical nature of the work role right, did it require a lot of data analytics, type training and background and understanding? Did it require a lot of analysis across multi or varied disciplines? Right, so that sort of thing to me determines whether or not a STEM-related degree is required.

P2 stated, "I'm never gonna be able to compete with IBM or Amazon or whatnot, but I offer access to you know, very interesting and unique work within the federal government." When possible, leaders should provide employees with challenging and intellectually stimulating tasks that align with their skills and interests to enhance motivation and reduce turnover (Alfayad & Arif, 2017; Dawson & Thomson, 2018; Shin & Alam, 2020). P2 was active in ensuring that employees found their work interesting and offered the following:

> We have enough variety in this organization that we can move people to a completely different work role. If you're tired of forensics or want to be more analytical, we have work role for that. If you want to be involved with scripting and the programming side, we have a role for that. We have a little bit of everything. It's just what do you want to try next? And, if it will keep you within

> this organization and keep you employed and happy, we can provide that to you, and it has helped us retain a lot of talent.

When P2 responded concerning whether interesting work was effective as a standalone strategy, P2 provided a continued perspective lending to professional development opportunities and stressed the need for monetary incentives with the following statement:

> We can give different work to keep up with their tradecraft and definitely money, money, money; they want to stay on par with their peers' (in the private sector) salaries. Those that are just looking for a change, we try to do it, and including the money works well.

Participants' acknowledgment and acceptance of the external pulls to entice STEM personnel did not deter or detract from the retention strategies. This display of flexibility, organizational support, and emotional intelligence is reflected in the employees (Sefidan et al., 2021).

During member checks, P4 implied that leaders mitigated retention when leaders can provide employees with engaging and intellectually stimulating projects, allowing them to use their niche skills to tackle real-world cybersecurity threats. With a follow-up question, I asked P4 to clarify the implication, and P4 stated,

> This stuff is real. What our people do protects the Nation. They may not realize it, but they are important, and I just don't think we drive that home enough. But that's a leader shortcoming. What they do is very, very important and we need them and their expertise.

When supervisors emphasize the importance of personnel contributions, the organization gains loyalty, and employee intent to leave is mitigated (Ramsey, 2020).

Participants agreed that by affording personal autonomy and the opportunity to make meaningful contributions, they could tap into intrinsic motivation, but only when combined with compensation. P1 also concluded that offering interesting work was an effective strategy: “The feedback I’ve gotten from them is that they find the work rewarding and interesting and I think that will entice them to stay a little bit longer with the organization.” This perspective lends credibility to employee retention efforts by emphasizing the intrinsic motivation and job satisfaction derived from the nature of the work (Elsahoryi et al., 2022). P3 creatively combined developmental opportunities with monetary incentives and said, “between the mix of things, the more you do, the more often, the better and they stick it out until they just can’t.” Each participant emphasized salary and interesting work as essential factors in retaining personnel; however, they also acknowledged that providing interesting work was a complementary strategy and was only effective when applied in conjunction with monetary incentives. Unique aspects apparent in participant response impacted organizational culture in positive ways to mitigate turnover. Their leadership abilities were apparent as they exuded emotional intelligence and showed deep respect and concern for personnel to exercise available options, allowing employees to have autonomy.

Emotional Intelligence

Participants were emotionally intelligent leaders. Participants’ actions most closely aligned with the description of a transformational leader as they tried to transform

their organization. Transformational leaders are flexible and committed to improving outcomes among their employees, including engagement, job performance, organizational commitment, and turnover (Sefidan et al., 2021). These leaders understood the value of feedback and individualized attention to create a work environment conducive to job satisfaction. When leaders entrust employees with meaningful work, it is a source of motivation (Herzberg, 1968).

Secondary sources obtained from the participating organization's human resources point of contact, which included an internal Professional Development Partnership policy and Defense Performance Management and Appraisal Program memorandum, revealed that organizational leaders formed relationships with other organizations, allowing the study participants to place personnel in different positions to broaden their experience, as requested, or to expose them to more interesting or meaningful work. Upon discussion with P2 during a member check, P2 reiterated the benefit of rotating personnel and expressed that it made them feel valued and resulted in positive work contributions. Emotionally intelligent leaders increase productivity and decrease the likelihood of intent to leave (Veshne & Munshi, 2020). Leader emotional intelligence motivated employees and positively impacted their relationships and overall job satisfaction.

Employee Autonomy

While Herzberg (1968) acknowledged that the two-factory theory was not a continuum, a significant gap in the theory is still a concern. In contrast to Herzberg's two-factor theory, study participants focused on employee autonomy to improve job

satisfaction and mitigating turnover. Herzberg's theory (Herzberg et al., 1959) did not account for individual desires regarding hygiene and motivator factors. Participant application of retention strategies to mitigate turnover coincided with Thant and Chang's (2021) conclusion. Thant and Chang surmised that Herzberg's universal approach to uncovering the root cause of job satisfaction required exploration from the employee as an individual. Employees are drawn to factors that suit them, which may change over time due to various circumstances.

Triangulation

With the specialized and high-demand skills STEM employees offer, those skills must provide the organization with a noteworthy advantage. Participants provided STEM employees with work that allowed them to control their careers, remain engaged, and hone their skills. In the organization's documented exit interviews, kept by the organization's HR liaison, results showed that STEM personnel were satisfied with their jobs and thought they were valued team members and contributors to the cyber mission. The sentiments participants expressed during member checks were consistent with the exit interviews and Herzberg's (Herzberg et al., 1959) findings which, indicated that interesting work was a motivator leading to job satisfaction.

The work itself theme emerged from the conceptual framework, participants responses during interviews, the organization's policy on Professional Development Partnerships, and actions taken by participants to provide work options to empower employees as a retention tool. To codify the practice of including rotational assignments as a retention strategy, a draft review of an updated version of the Professional

Development Partnership policy, with three additional organizations, documented the cooperating organizations, type of work available, and duration of the assignment. The Professional Development Partnership policy, Retention Incentive policy, and information gained from OPM validated findings and contributed to data saturation.

Theme 3: Individual Considerations (Two-Factor Theory Gap)

Retention of personnel with niche skill sets in the public sector requires a nuanced approach that may require leaders to consider individual desires, especially when the public sector cannot match the salary offerings of the private sector. P3 expressed the following, “So what is important to one individual is not always important to the next, so we use everything from, yes, incentives such as retention incentives, we make sure we have performance awards, we send them to training, purchase certifications.” Virgiawan et al. (2021) supported the need for personalized attention to find a strategy to alleviate retention; leader displays of commitment and involvement are key (Bass, 1996). Employees’ actions are reciprocated based on their perception of organizational support (Sadaf et al., 2022). Leader commitment may encourage the same, providing a sense of security and stability to ward off an intent to leave. P2 stated, “When we do lose individuals, it’s usually for better circumstances, not necessarily because of a bad work environment or they’re bored.” P2 concluded, “and as most people say, we don’t quit our jobs; we quit our supervisor.”

Literature and study findings supported the need for leaders to connect with the employees to determine what is important to them and why; however, the conceptual framework did not. Herzberg (1965) surmised that factors influencing job satisfaction

were external or internal to employees. However, Herzberg (1968) did not include an assessment or inquiry as to whether or how one employee was personally influenced over another by either factor to affect job satisfaction. Career goals are pivotal in retention (Hull-Blanks et al., 2020). Leader engagement is critical to understanding what employees desire and how they can benefit the organization. P1 explained, "if I identify talent with STEM degreed personnel that I want to retain, I try to move them to other, more technical teams, busier teams, other sections, or sub-organizations that do more interesting work."

P3 provided options because employees were not always aware of potential opportunities and asked the following for STEM employees to consider:

> Maybe have you thought about this? Would you like to try that? Would you be happy, and would you remain if we…you know. Let them know we could send them over to another section that would give them something completely different.

Supervisors' consideration for individual's professional goals and desires were instrumental in averting turnover. Herzberg's (1968) study may have potentially resulted in a different outcome had individual considerations been included in the development of the two-factor theory.

During a member check, P2 surmised that some individuals (STEM personnel) may prioritize a sense of purpose and public service that comes with working in the public sector over financial compensation; however, P2 posited, "it may depend on age,

where they are financially, and what they want to accomplish." Last, the most impact responses came from P4, who said the following:

> It's actually individualistic because what is important…we have a wide range of generations, what a college student or graduate wants versus somebody in their 50s wants is completely different. This has to be tailored to their individual needs to get at what actually works.

The organization's Defense Performance Management and Appraisal Program policy grants participants the latitude to provide training outlined in the organization's Annual Training Guide in addition to employees' personal and professional growth desires, which are identified in their individual development plan.

Triangulation

As documented in journal notes gathered from the organization's exit interviews, departed employees expressed appreciation for retention incentives, learning new things, and the opportunity to contribute to DoD-A efforts. The combination of strategies spawned the development of Theme 3. In addition, the Defense Performance Management and Appraisal Program policy requires supervisors (participants) to conduct quarterly counseling, an opportunity to formally engage personnel and help them plan for professional and personal growth by developing an individual development plan. In doing so, supervisors learn what employees value (motivators and hygiene factors) and are better positioned to identify how to align organizational goals with employee needs to achieve objectives. Such intentional concern and desire to appease the individual were not considered in Herzberg's (1965) study, which may have altered findings. This study

consisted of transformational leaders. According to Virgiawan et al. (2021), transformational leaders are willing to evaluate and reevaluate the state of the organization and the people within to foster a culture where personnel are encouraged and empowered. As documented in journal notes derived from interviews, member checks, and exit interviews, participants' time within the organization, their understanding of the problem, and their commitment to improve the organization and care for people decreased employee intent to leave and contributed to perceived organizational support.

Theme 4: Transactional Retention (Two-Factor Theory Contradiction)

DoD-Army leaders have invested considerable time and money into recent graduate programs for recruitment and retention. Ideally, recent graduates are the talent pool of choice as they are amenable to new challenges and introduce innovative thought (Clark-Ambrosini et al., 2023). However, the programs are transactional and may require a revamp to increase the return on investment for the DoD. Transactional retention is rooted in employees' commitment to their current organization when they perceive an ongoing and mutually beneficial exchange with their leaders. P2 offered, "We give retention incentives or retention bonuses to lure people to stay." P1 provided additional insight and said the following:

> We have the most robust award system of any organization I've seen within the Army, and we ensure that we show our individuals that if they work hard, we not only recognize it, but we recognize it either monetarily or honorary.

Participants' efforts centered around the principle that employees are more likely to stay when they see their efforts are recognized, rewarded, and valued (Veshne & Munshi, 2020). This concept suggests a dynamic exchange exists where employees and the organization engage in a continuous give-and-take relationship, maintaining a balance between what each party offers and receives (Baruch & Rousseau, 2019).

Organization leaders also use scholarships and student loan repayments to recruit and retain STEM graduates. For example, if the STEM graduate works for 2 years for the organization, they receive 2 years of tuition payments. However, this transaction has chiefly benefitted the STEM graduate, leaving the organization at a deficit. P1 offered, "The two most recent graduates, once they finished with their scholarships, did leave, and there was nothing we could do to entice them to stay because we set them up for success." P2 added, "They'll stick around long enough for us to get some return on investment for it, but the return on investment is definitely in their favor."

Higher salaries and better offers elsewhere are particularly enticing for recent graduates. This salary concern can significantly affect their decision to leave their current positions as they seek opportunities that promise financial stability and more rewarding and fulfilling work experience. P2 explained,

> If we do not offer them additional compensation, again, it will never be commensurate with what others can offer, but if we can raise everyone's feeling of value and show them how much we appreciate it on a monthly basis and in their salary or in some manner.

In this context, the allure of better opportunities that lead to a better quality of life becomes a compelling reason to move on. Recent graduates may be inclined to leave their positions without this consistent quid pro quo relationship with their leaders. During member checks, P4 offered further insight into the recent graduate recruitment and retention process:

> We actually travel to different colleges and conference events to find STEM graduates. They're excited to come and work in cyber, but it gets a bit funny when it comes to the completion of school payments. They may be with us for 2-3 years and we're giving money, and trying to tap in to figure out what's important to' em, but in the end, we just can't, and they take the big offers.

When opportunities for skill development, mentorship, or career progression are exhausted, and employees feel undervalued and disconnected from their work, they are more likely to explore other options where they believe their needs can be met more effectively (Alrawahi et al., 2020); P2 added, "because their dissatisfaction wasn't with the organization, it was just, the betterment of their position in life and their family, to make a little extra money."

Triangulation

Transactional retention is not sustainable. Retention incentives are likely to end for some federal positions, which include positions identified to receive TLMS (OPM Retention Incentives Ending, n.d.-c). As described by Bass (1985), transactional leaders thrive in quid pro quo relationships with employees and use incentives, rewards, and recognition to control personnel and thereby achieve organizational goals. However, this

study's findings show that employees are in a position of power, leaving leaders to strategize and find creative ways to convince employees to stay while simultaneously trying to achieve organizational goals. Participant interview responses combined with historical data reviewed in the organization's exit interviews showed that STEM employees inquired about job opportunities that offered better incentives than those provided by the participating organization. During interviews, a participant stated, "They'll stick around long enough for us to get some return on investment for it, but the return on investment is definitely in their favor." The statement was the catalyst for the development of Theme 4. Post theme development, I devoted additional time and effort to explore whether the term *transactional retention* existed in scholarly journals, and it did not.

As documented in journal notes, member checks highlighted that participants realize retention may remain a concern. Herzberg (1968) posited that employees willing to contribute to the organization are helpful, and those who are not must go to prevent morale and motivation problems. Although unintentional, participants' overall actions aligned with Herzberg's (1968) description of the eternal triangle:

- Meet the needs of personnel by aligning organizational needs with position requirements;
- Use the incentives available to them to achieve the most from employees while benefitting the organization; and
- Implement strategies that improve attitudes and morale.

As noted in journal notes to document participant member checks, participants not only validated and agreed with findings but reiterated that economic development and labor market demands show that STEM employees in public sector jobs are in the position of control and will continue to take advantage of current transactional retention practices within DoD-A which may leave organizations at a disadvantage.

Applications to Professional Practice

Retention strategies used in U.S. Army cyberfocused organizations can serve as a valuable template for enhancing professional practices in business. Strategies identified in this study are particularly relevant for businesses seeking to retain and develop specialized talent in high-demand fields. Perceived organizational support and engaged leaders willing to tailor retention efforts and recognize contributions can help retain individuals passionate about their niche skill set and potential to bring about meaningful change (Srivastava & Agrawal, 2020). This study explored retention strategies to retain high-demand personnel in a public sector organization with a limited capacity to match salaries or workplace flexibilities offered in the private sector. While participants were flexible, engaging, and generous with monetary incentives, developmental opportunities, and awards, STEM employee's commitment existed based on a transactional, quid pro quo relationship. Participants proved and confirmed that a leader's inability to match salary is an obstacle to retention. This study showed that alternatives to fiscal options are critical and may require leader, management, and organizational introspection to reveal alternatives.

Supervisors must be willing to reevaluate employee KSAs and work requirements to ensure organizational strategic goals are achieved. As the civilian cohort is intended to supplement and provide continuity to the military cohort, it is likely that there is an untapped talent pool within the military cohort that may qualify for STEM positions upon exiting the military without a STEM degree. In concert with strategic planners, management teams must continuously assess organizational outcomes and levels of productivity to ensure they align with KSAs and aptitude (Dawson & Thomson, 2018). Understanding individual considerations may allow leaders in public sector organizations to tailor retention strategies accordingly, strategically plan, reassess current STEM education requirements, and explore alternatives to align organizational needs with available and unexplored talent pools.

Implications for Social Change

This study's findings could positively contribute to social change by improving supervisors' knowledge regarding what motivates personnel with unique skills to strengthen the workforce, thereby increasing the likelihood of achieving organizational goals. Supervisors in the private and public sectors could use study findings to mitigate retention and increase understanding regarding individual needs in fields with a limited talent pool. Leader engagement and perceived organizational support increase morale and cohesion, mitigating workplace toxicity and positively affecting organizational culture (Al-Hussaini et al., 2019; Andriyanti & Supartha, 2021; Sadaf et al., 2022). In addition, findings show that when leaders continue to seek ways to recognize and show appreciation for employee talent and commitment, they mitigate turnover and provide

employment stability that positively impacts the community and the organization. Such tangible improvements significantly enhance individuals' quality of life, which may have a ripple effect on families.

When supervisors retain experienced and skilled personnel, they can maintain a highly competent and knowledgeable workforce, directly impacting management's ability to fulfill mission requirements effectively and efficiently. Additionally, leaders reduce costs associated with recruitment, onboarding, and training new employees, creating a stable environment (Ekhsan et al., 2022). A stable and experienced workforce enhances the organization's operational efficiency and fosters a culture of institutional knowledge and continuous improvement to contribute to long-term success and sustainability for the organization, employees, and the community.

Recommendations for Action

Implementing retention strategies that benefit the organization is applicable in every business, regardless of size, specifically when there is a high demand and a small selection pool. Study participants led by example and were engaging and creative in instituting the options available to retain STEM personnel. Participants remained hopeful about TLMS; however, they needed more support with the slow pace of implementation. This study could inform DoD-Army human resources strategic planners, DoD-Army leaders, organization leaders, and managers. I recommend that leaders at every level reassess education requirements that may impede achieving organizational goals, explore alternatives to personnel with STEM degrees, and evaluate current processes and practices to create a new DoD-Army paradigm regarding recruitment and retention

beneficial to the Army and personnel. Including personnel with KSAs to fill critical roles in addition to STEM graduates and the military cohort may prove helpful to mitigate turnover and improve operations.

Reassess Education Requirements

The first recommendation is to reassess education requirements for STEM positions. One essential facet of this reassessment is ensuring that education requirements are relaxed. Rigid academic prerequisites can inadvertently limit the potential talent pool, as they might exclude individuals who have obtained the necessary KSAs through alternative pathways. Supervisors' consideration of KSAs and relevant certifications reduces bias and increases opportunities to hire personnel in underrepresented talent pools (J. C. Williams & Mihaylo, 2019). By acknowledging and accommodating such diverse learning alternatives, organizations can access a more comprehensive and diverse range of applicants. This inclusivity is essential for fostering diversity and capitalizing on unique skills and perspectives that can improve organizational culture and reduce turnover.

Technologies and methodologies are changing rapidly. Therefore, excessive emphasis on academic degrees may cause leaders to overlook candidates who have stayed current with the latest developments through continuous learning, self-study, or industry certifications. Reassessing education requirements can help organizations remain competitive (Sussman, 2021) by allowing them to recognize and leverage expertise that may not reflected in traditional academic transcripts. This adaptability is crucial for staying at the forefront of innovation in fields where staying current is pivotal. By

adjusting education prerequisites, organizations can bridge the gap between available talent and their operational needs (Schultheiss et al., 2023). This adaptability is vital to maintain continuity and ensure the organization remains agile. A flexible approach to education requirements can be a key enabler in addressing skill shortages and fostering innovation, benefiting employers and their communities.

Active Military to Civilian in Science, Technology, Engineering, and Math Positions

The second recommendation is to create a succession plan and consider military personnel exiting the U.S. Army with KSAs or the aptitude to work in critical, hard-to-fill positions currently reserved for individuals with STEM degrees. Veterans' familiarity with DoD culture and KSAs in their respective fields provide continuity and balance (Ramsey, 2020). Veterans, or soon-to-be veterans, are enthusiastic, fully grasp their work's impact on society, and find the work interesting. Employees committed to the organization's goals may be more willing to forgo higher salaries in favor of a sense of purpose and alignment with the organization's mission (Zhenjing et al., 2022). Cultivating this culture can help keep talent despite higher-paying offers elsewhere by creating an environment that emphasizes the work's intrinsic value and the organization's distinct mission. A mix of STEM graduates and non-degree holders capable of working in STEM work roles to supplement the military cohort is ideal.

Integrating military-to-civilian strategic planning in talent retention cannot be overstated, particularly when leaders consider individuals with a deep commitment and understanding of organizational strategic goals and essential KSAs acquired during their

military service in hard-to-fill positions. Such an approach brings unique advantages to organizations, such as

- specialized KSAs acquired while working as an active-duty soldier in the same capacity as STEM graduates,
- alignment with organizational values that resonate with the organization's mission,
- loyalty and commitment to the organization and the mission, and
- knowledge transfer that may accelerate the learning curve of team members and enhance the organization's overall capabilities.

Leveraging these attributes can lead to more effective talent retention, a more robust workforce, and the successful pursuit of organizational strategic goals (Sopiah et al., 2020). González and Simpson (2020) recognized positive veteran effects such as teamwork skills and emotional stability. Last, reintegrating this population will allow the organization to retain historical knowledge only this population can provide. Reintegration will also help balance the shortcomings of new STEM graduates who possess knowledge gained solely in college yet need more practical experience. I intend to share study findings with the organization that agreed to provide participants and access to valuable information included in this study. In addition, this study will be accessible via Walden University and ProQuest.

Recommendations for Further Research

At the time of this study, supervisors used interim retention strategies. As the primary data collection instrument with firsthand knowledge and experience with the

effects of the interim retention strategies, I may have inadvertently introduced confirmation bias. In addition, I conducted this study while the implementation of a significant effort to retain STEM personnel was in progress, referred to in this study as Targeted Local Market Supplement or TLMS. I recommend further research to determine the effectiveness of TLMS post-implementation and include a survey or questionnaire to mitigate the introduction of confirmation bias. Additional recommendations for future study include TLMS-targeted personnel to gain different insights and perspectives that may inform business practices.

Reflections

This doctoral journey was motivated by my promise as a teenager to one day see such an achievement come to fruition and make my grandparents proud. Although they are no longer physically with me, I *still* want to make my grandparents proud. This journey, similar to the journey of my fellow students, was overcome with grief at times as many family members passed, and several birthdays received minimal acknowledgment as I worked to get to the finish line. The most rewarding and memorable part of the journey was the birth of my grandson. As I crafted this section of the study, I received a call and heard him say “grandma” for the first time.

From a professional perspective, I strive to be the leader I have always wanted, and I hope this study will help improve leader awareness. I consistently see underutilized talent leave the organization. I was aware of the retention challenges faced by my organization and others. This single case study allowed me to delve into retention

strategies. In doing so, I had the opportunity to collaborate with passionate leaders who were engaged with the people in their care and eager to improve their organizations.

I am overcome with emotions and grateful for a husband who blocked the distractions and mundane responsibilities of maintaining a home to allow me to focus on *my* journey, which I soon realized was *our* journey. His motivation tactics (sometimes tough love) and efforts to ensure I was warm and fed while I worked meant the world to me and made this journey easy.

Conclusion

Retaining STEM graduates may remain a challenge in the near future. They are assets, and there is an opportunity to capitalize on the ingenuity and new thought they offer; howeer, leaders may need to reassess talent pool feasibility and education requirements. If leaders can widen the aperture to benefit from the availability of a value-added and overlooked segment of personnel who possess KSAs sans a STEM degree, retention may be decreased exponentially. Last, including former military personnel who are subject matter experts in cyber yet lack a STEM degree offer the KSAs to contribute to cyber challenges and complement the active-duty cohort along with STEM degree holders. The DoD-Army gains a return on investment by including a skilled, knowledgeable, and willing talent pool to fill critical positions.

References

Adler, R. H. (2022). Trustworthiness in qualitative research. *Journal of Human Lactation, 38*(4), 598–602. https://doi.org/10.1177/08903344221116620

Aguboshim, F. C. (2021). Adequacy of sample size in a qualitative case study and the dilemma of data saturation: A narrative review. *World Journal of Advanced Research and Reviews, 10*(3), 180–187. https://doi.org/10.30574/wjarr.2021.10.3.0277

Ahmad, S., Wasim, S., Irfan, S., Gogoi, S., Srivastava, A., & Farheen, Z. (2019). Qualitative v/s quantitative research. *Journal of Evidence Based Medicine and Healthcare, 6*(43), 2828–2832. https://doi.org/10.18410/jebmh/2019/587

Akram, J., & Ping, L. (2020). How to build a vulnerability benchmark to overcome cyber security attacks. *The Institute of Engineering and Technology*, *14*(1), 60–71. https://doi.org/10.1049/iet-ifs.2018.5647

Al Aina, R., & Atan, T. (2020). The impact of implementing talent management practices on sustainable organizational performance. *Sustainability*, *12*(20), Article 8372. http://doi.org/10.3390/su12208372

Alam, M. K. (2021). A systematic qualitative case study: Questions, data collection, NVivo analysis and saturation. *Qualitative Research in Organizations and Management: An International Journal*, *16*(1), 1–31. https://doi.org/10.1108/qrom-09-2019-1825

Alexander, P. A. (2020). Methodological guidance paper: The art and science of quality systematic reviews. *Review of Educational Research, 90*(1), 6–23. https://doi.org/10.3102%2F0034654319854352

Alfayad, Z., & Arif, L. S. M. (2017). Employee voice and job satisfaction: An application of Herzberg two-factor theory. *International Review of Management and Marketing, 7*(1), 150–156.

Al-Hussaini, S. H., Turi, J. A., Altamimi, A. N. A., Khan, M. A., & Ahmad, M. (2019). Impact of talent management strategies on employee performance behaviour with the mediating role of talent management outputs. *Archives of Business Research, 7*(3), 116–124. https://doi.org/10.14738/abr.73.6309

Ali, B. J., & Anwar, G. (2021). Employee turnover intention and job satisfaction. *International Journal of Advanced Engineering, Management and Science, 7*(6), 22–30. https://doi.org/10.22161/ijaems.76.3

Alrawahi, S., Sellgren, S. F., Altouby, S., Alwahaibi, N., & Brommels, M. (2020). The application of Herzberg's two-factor theory of motivation to job satisfaction in clinical laboratories in Omani hospitals. *Heliyon, 6*(9), Article e04829. https://doi.org/10.1016/j.heliyon.2020.e04829

Alshmemri, M., Shahwan-Akl, L., & Maude, P. (2017). Herzberg's two-factor theory. *Life Science Journal, 14*(5), 12–16. https://doi.org/10.1037/e570112013-034

Al-Suraihi, W. A., Samikon, S. A., Al-Suraihi, A.-H. A., & Ibrahim, I. (2021). Employee turnover: Causes, importance and retention strategies. *European Journal of*

Business and Management Research, *6*(3), 1–10. https://doi.org/10.24018/ejbmr.2021.6.3.893

Andriyanti, N. P. V., & Supartha, I. W. G. (2021). Effect of perceived organizational support on organizational citizenship behavior with job satisfaction as mediating variables. *American Journal of Humanities and Social Sciences Research*, *5*(1), 46–55. https://doi.org/10.55677/ijssers/v03i2y2023-04

Arici, H. E., Arasli, H., Köseoglu, M. A., Sokmen, A., & Arici, N. C. (2023). Job embeddedness in hospitality and tourism scholarship: Past, present, and future research agenda. *International Journal of Hospitality Management*, *109*, Article 103417. https://doi.org/10.1016/j.ijhm.2022.103417

Army Human Research Protections Office. (n.d.). *Welcome to AHRPO*. Retrieved April 4, 2023, from https://ahrpo.army.mil

Arvindraj, A., & Shanmugam, J. K. (2019). Factors influencing employee's turnover intention in banking sector in Penang. *E-Academia Journal*, *8*(2). https://myjms.mohe.gov.my/index.php/JeA/article/view/7383

Atrews, R. (2020). Cyberwarfare: Threats, security, attacks, and impact. *Journal of Information Warfare*, *19*(4), 17–28.

Badampudi, D., Fotrousi, F., Cartaxo, B., & Usman, M. (2022). Reporting consent, anonymity and confidentiality procedures adopted in empirical studies using human participants. *E-Informatica*, *16*(1), 1–24. https://doi.org/10.37190/e-Inf220109

Bans-Akutey, A., & Tiimub, B. M. (2021). Triangulation in research. *Academia Letters*. https://doi.org/10.20935/al3392

Barhate, B., & Dirani, K. M. (2022). Career aspirations of generation Z: A systematic literature review. *European Journal of Training and Development*, *46*(1/2), 139–157. https://doi.org/10.1108/EJTD-07-2020-0124

Baruch, Y., & Rousseau, D. M. (2019). Integrating psychological contracts and ecosystems in career studies and management. *Academy of Management Annals, 13*(1), 84–111. https://doi.org/10.5465/annals.2016.0103

Bass, B. M. (1985). *Leadership and performance beyond expectations.* Free Press.

Bass, B. M. (1996). *A new paradigm of leadership: An inquiry into transformational leadership*. US Army Research Institute for the Behavioral and Social Sciences. https://apps.dtic.mil/sti/pdfs/ADA306579.pdf

Bass, B. M., & Stogdill, R. M. (1990). *Bass & Stogdill's handbook of leadership: Theory, research, and managerial applications*. Simon and Schuster.

Bastian, N. D., Lunday, B. J., Fisher, C. B., & Hall, A. O. (2020). Models and methods for workforce planning under uncertainty: Optimizing U.S. Army cyber branch readiness and manning. *Omega, 92,* Article 102171. https://doi.org/10.1016/j.omega.2019.102171

Bateh, D. (2019). Leadership from millennials to generation Z transformed. *Journal of Advanced Management Science, 7*(1), 11–14. https://doi.org/10.18178/joams.7.1.11-14

Belete, A. K. (2018). Turnover intention influencing factors of employees: An empirical work review. *Journal of Entrepreneurship & Organization Management*, *7*(3), 1–7. https://doi.org/10.4172/2169-026x.1000253

Bergen, N., & Labonté, R. (2020). "Everything is perfect, and we have no problems": Detecting and limiting social desirability bias in qualitative research. *Qualitative Health Research*, *30*(5), 783–792. https://doi.org/10.1177/1049732319889354

Berndt, A. E. (2020). Sampling methods. *Journal of Human Lactation*, *36*(2), 224–226. https://doi.org/10.1177/0890334420906850

Biasutti, M., Antonini Philippe, R., & Schiavio, A. (2022). Assessing teachers' perspectives on giving music lessons remotely during the COVID-19 lockdown period. *Musicae Scientiae*, *26*(3), 585–603. https://doi.org/10.1177/1029864921996033

Biden, J. (2023a). National cybersecurity strategy of the United States. https://www.whitehouse.gov/wp-content/uploads/2023/03/National-Cybersecurity-Strategy-2023.pdf

Biden, J. (2023b). National cyber workforce and education strategy: Unleashing America's cyber talent. https://www.whitehouse.gov/wp-content/uploads/2023/07/NCWES-2023.07.31.pdf

Birks, M., Hoare, K., & Mills, J. (2019). Grounded theory: The FAQs. *International Journal of Qualitative Methods*, *18*. https://doi.org/10.1177/1609406919882535

Bjørvik, E., Thoresen, L., Salamonsen, A., Fauske, L., & Solbrække, K. N. (2023). Exploring the impact of interview location on knowledge development.

International Journal of Qualitative Methods, *22*. https://doi.org/10.1177/16094069231168483

Bloomfield, J., & Fisher, M. J. (2019). Quantitative research design. *Journal of the Australasian Rehabilitation Nurses' Association*, *22*(2), 27–30. https://doi.org/10.33235/jarna.22.2.27-30

Borgstede, M., & Scholz, M. (2021). Quantitative and qualitative approaches to generalization and replication–a representationalist view. *Frontiers in Psychology*, *12*, Article 605191. https://doi.org/10.3389/fpsyg.2021.605191

Bougie, R., & Sekaran, U. (2020). *Research methods for business: A skill-building approach* (8th ed.). Wiley & Sons.

Braaten, B., Kramer, A., Henderson, E., Kajfez, R., & Dringenberg, E. (2020, October 21–24). Accessing complex constructs: Refining an interview protocol [Paper presentation]. *2020 IEEE Frontiers in Education Conference (FIE)*, Uppsala, Sweden. https://doi.org/10.1109/FIE44824.2020.9274260

Brewington, J., & Darko, J. (2020). Collaboration and engagement at the NLN: Co-creating a positive organizational culture. *Nursing Education Perspectives*, *41*(2), 138. https://doi.org/10.1097/01.nep.0000000000000648

Brown, A., & Danaher, P. A. (2019). CHE principles: Facilitating authentic and dialogical semi-structured interviews in educational research. *International Journal of Research & Method in Education*, *42*(1), 76–90. https://doi.org/10.1080/1743727X.2017.1379987

Burles, M. C., & Bally, J. M. (2018). Ethical, practical, and methodological considerations for unobtrusive qualitative research about personal narratives shared on the internet. *International Journal of Qualitative Methods*, *17*(1), 1–9. https://doi.org/10.1177/1609406918788203

Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological Research and Practice*, *2*, Article 14. https://doi.org/10.1186/s42466-020-00059-z

Çakar, K., & Aykol, Ş. (2023). The past of tourist behaviour in hospitality and tourism in difficult times: A systematic review of literature (1978-2020). *International Journal of Contemporary Hospitality Management*, *35*(2), 630–656. https://doi.org/10.1108/IJCHM-12-2021-1475

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing*, *25*(8), 652–661. https://doi.org/10.1177/1744987120927206

Carcary, M. (2020). The research audit trail: Methodological guidance for application in practice. *Electronic Journal of Business Research Methods*, *18*(2), 166–177. https://doi.org/10.34190/JBRM.18.2.008

Casey, L. J., & Vogel, M. D. (2019). Preparing for the next generation: Profiles of millennial city managers and their approach to the job. *State and Local Government Review*, *51*(2), 122–133. https://doi.org/10.1177/0160323X19889094

Cassell, C., & Bishop, V. (2019). Qualitative data analysis: Exploring themes, metaphors and stories. *European Management Review*, *16*(1), 195–207. https://doi.org/10.1111/emre.12176

Cattermole, G. (2019). Developing the employee lifecycle to keep top talent. *Strategic HR Review*, *18*(6), 258–262. https://doi.org/10.1108/shr-05-2019-0042

Chanana, N., & Sangeeta. (2020). Employee engagement practices during COVID-19 lockdown. *Journal of Public Affairs*, *21*(4), Article e2508 https://doi.org/10.1002/pa.2508

Chavadi, C. A., Sirothiya, M., & Vishwanatha, M. R. (2021). Mediating role of job satisfaction on turnover intentions and job mismatch among millennial Employees in Bengaluru. *Business Perspectives and Research*, *10*(1), 79–100. https://doi.org/10.1177/2278533721994712

Cheng, C., Elsworth, G. R., & Osborne, R. H. (2022). Validity evidence of the eHealth Literacy Questionnaire (eHLQ) Part 2: Mixed methods approach to evaluate test content, response process, and internal structure in the Australian community health setting. *Journal of Medical Internet Research*, *24*(3), Article e32777. https://doi.org/10.2196/32777

Chun Tie, Y., Birks, M., & Francis, K. (2019). Grounded theory research: A design framework for novice researchers. *SAGE Open Medicine*, *7*, Article 2050312118822927. https://doi.org/10.1177/2050312118822927

Clark-Ambrosini, J. L., Ashleigh, M. J., Higgs, M., & Baruch, Y. (2023). Quid pro quo? The future for graduate development programmes through the lens of talent

management. *International Journal of Human Resource Management, 34*(17), 3253–3276. https://doi.org/10.1080/09585192.2022.2117991

Coleman, P. (2021). Validity and reliability within qualitative research in the caring sciences. *International Journal of Caring Sciences*, *14*(3), 2041–2045.

Committee on National Security Systems. (2015). Committee on National Security Systems (CNSS) Glossary. CNSS Instruction 4009. https://www.cnss.gov/CNSS/issuances/Instructions.cfm

Crumpler, W., & Lewis, J. A. (2019). *The cybersecurity workforce gap*. Washington, DC, U.S.A.: Center for Strategic and International Studies (CSIS). https://www.csis.org/analysis/cybersecurity-workforce-gap

Davies, L., LeClair, K. L., Bagley, P., Blunt, H., Hinton, L., Ryan, S., & Ziebland, S. (2020). Face-to-face compared with online collected accounts of health and illness experiences: A scoping review. *Qualitative Health Research, 30*(13), 2092–2102. https://doi.org/10.1177/1049732320935835

Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-methods research: A discussion on its types, challenges, and criticisms. *Journal of Practical Studies in Education*, *2*(2), 25–36. https://doi.org/10.46809/jpse.v2i2.20

Dawson, J., & Thomson, R. (2018). The future cybersecurity workforce: Going beyond technical skills for successful cyber performance. *Frontiers in Psychology*, *9*, Article 00744. https://doi.org/10.3389/fpsyg.2018.00744

De Toni, A. F., & Pessot, E. (2021). Investigating organisational learning to master project complexity: An embedded case study. *Journal of Business Research*, *129*, 541–554. https://doi.org/10.1016/j.jbusres.2020.03.027

Dowling, W. F. (1971). An interview with Frederick Herzberg: Managers or animal trainers? *Management Review*, *60*(7), 2–15.

Dwyer, M., Sheppard, L., Hidalgo, A., & Dalton, M. (2020). *To compete, invest in people: Retaining the U.S. defense enterprise's technical workforce.* Center for Strategic and International Studies (CSIS). https://www.csis.org/analysis/compete-invest-people-retaining-us-defense-enterprises-technical-workforce

Ekhsan, M., Sudiro, A., Mugiono, M., & Hussein, A. S. (2022). Employee retention and change management during times of uncertainty. *Frontiers in Psychology*, *13*, Article 916709. https://doi.org/10.3389/fpsyg.2022.916709

Elsahoryi, N. A., Alathamneh, A., Mahmoud, I., & Hammad, F. (2022). Association of salary and intention to stay with the job satisfaction of the dietitians in Jordan: A cross-sectional study. *Health Policy OPEN*, *3*. https://doi.org/10.1016/j.hpopen.2021.100058

Exec. Order No. 14,028, 86 C.F.R. 26633. (2021). 26633–26647. https://www.federalregister.gov/documents/2021/05/17/2021-10460/improving-the-nations-cybersecurity

Farquhar, J., Michels, N., & Robson, J. (2020). Triangulation in industrial qualitative case study research: Widening the scope. *Industrial Marketing Management*, *87*, 160–170. https://doi.org/10.1016/j.indmarman.2020.02.001

Favaretto, M., De Clercq, E., Gaab, J., & Elger, B. S. (2020). First do no harm: An exploration of researchers' ethics of conduct in Big Data behavioral studies. *PLoS ONE*, *15*(11), 1–23. https://doi.org/10.1371/journal.pone.0241865

FitzPatrick, B. (2019). Validity in qualitative health education research. *Currents in Pharmacy Teaching and Learning*, *11*(2), 211–217. https://doi.org/10.1016/j.cptl.2018.11.014

Furnell, S. (2021). The cybersecurity workforce and skills. *Computers & Security*, *100*, Article 102080. https://doi.org/10.1016/j.cose.2020.102080

Georgescu, M. A., & Herman, E. (2019). Productive employment for inclusive and sustainable development in European Union countries: A multivariate analysis. *Sustainability*, *11*(6), Article 1771. https://doi.org/10.3390/su11061771

Gill, S. L. (2020). Qualitative sampling methods. *Journal of Human Lactation*, *36*(4), 579–581. https://doi.org/10.1177/0890334420949218

González, J. A., & Simpson, J. J. (2020). The workplace integration of veterans: Applying diversity and fit perspectives. *Human Resource Management Review*, *31*(2), Article 100775. https://doi.org/10.1016/j.hrmr.2020.100775

Goodman, P., Robert, R. C., & Johnson, J. E. (2020). Rigor in PhD dissertation research. *Nursing Forum*, *55*(4), 611–620. https://doi.org/10.1111/nuf.12477

Guo, Y., Hou, Y., Hao, Y., & Xu, W. (2020). Modeling and analysis of cyberspace threat sources based on vulnerabilities. *Advances in Intelligent Systems and Computing*, 292–303. https://doi.org/10.1007/978-3-030-50399-4_28

Harcey, S. R., Steidl, C. R., & Werum, R. (2021). STEM degrees and military service: An intersectional analysis. *Armed Forces & Society*, 1–23. https://doi.org/10.1177/0095327x211022999

Hassan, Q., Mubeen, N., Ali, S., & Sajjid, N. (2022). Job satisfaction through performance appraisal: Moderating role of locus of control. *International Journal of Management Research and Emerging Sciences*, *12*(3). https://doi.org/10.56536/ijmres.v12i3.242

Haven, T. L., & Van Grootel, L. (2019). Preregistering qualitative research. *Accountability in Research: Policies & Quality Assurance*, *26*(3), 229–244. https://doi.org/10.1080/08989621.2019.1580147

Hayati, N. R. (2019). Building a conceptual framework for recruitment process. *Global Business & Management Research*, *11*(1), 242–248.

Hennink, M., & Kaiser, B. (2019). Saturation in qualitative research. *SAGE Research Methods Foundations.* https://doi.org/10.4135/9781526421036822322

Herzberg, F. (1965). The motivation to work among Finnish supervisors. *Personnel Psychology*, *18*(4), 393–402.

Herzberg, F. (1968). One more time: How do you motivate employees? *Harvard Business Review*, *65*(5), 109–120.

Herzberg, F., Mausner, B., & Snyderman, B. (1959). *The motivation to work* (2nd ed.). Wiley.

Heyns, M. M., & Kerr, M. D. (2018). Generational differences in workplace motivation. *SA Journal of Human Resource Management*, *16*(1), 1–10. https://doi.org/10.4102/sajhrm.v16i0.967

Holston-Okae, B. L., & Mushi, R. J. (2018). Employee turnover in the hospitality industry using Herzberg's two-factor motivation-hygiene theory. *International Journal of Academic Research in Business and Social Sciences, 8*(1), 218–248. https://doi.org/10.6007/IJARBSS/v8-i1/3805

Hull-Blanks, E., Kurpius, S. E. R., Befort, C., Sollenberger, S., Nicpon, M. F., & Huser, L. (2020). Career goals and retention-related factors among college freshmen. *Journal of Career Development, 32*(1), 16–30. https://doi.org/10.1177/0894845305277037

Imam, H., Naqvi, M., Naqvi, S., & Chambel, M. (2020). Authentic leadership: Unleashing employee creativity through empowerment and commitment to the supervisor. *Leadership and Organization Development Journal, 41*(6), 847–864. https://doi.org/10.1108/LODJ-05-2019-0203

Jarupathirun, S., & Gennaro, M. D. (2018). Factors of work satisfaction and their influence on employee turnover in Bangkok. Thailand. *International Journal of Technology*, *9*(7), 1460–1468. https://doi.org/10.14716/ijtech.v9i7.1650

Johnson, J. L., Adkins, D., & Chauvin, S. (2020). A review of the quality indicators of rigor in qualitative research. *American Journal of Pharmaceutical Education, 84*(1), Article 7120. https://doi.org/10.5688/ajpe7120

Joplin, T., Greenbaum, R. L., Wallace, J. C., & Edwards, B. D. (2021). Employee entitlement, engagement, and performance: The moderating effect of ethical leadership. *Journal of Business Ethics, 168*(4), 813–826. https://doi.org/10.1007/s10551-019-04246-0

Kamanzi, A., Romania, M., Glenna, L., & Hesse, A. (2019). Rethinking confidentiality in qualitative research in the era of big data. *American Behavioral Scientist, 63*(6), 743–758. https://doi.org/10.1177/0002764219826222

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher, 42*(8), 846–854. https://doi.org/10.1080/0142159X.2020.1755030

Koziol, L., & Koziol, M. (2020). The concept of the trichotomy of motivating factors in the workplace. *Central European Journal of Operations Research*, *28*(2), 707–715. https://doi.org/10.1007/s10100-019-00658-5

Kyngäs, H. (2020). *The application of content analysis in nursing science research*. *Qualitative research and content analysis*. Springer International Publishing. https://doi.org/10.1007/978-3-030-30199-6_1

Lavee, E., & Itzchakov, G. (2021). Good listening: A key element in establishing quality in qualitative research. *Qualitative Research, 23*(3), 614–631. https://doi.org/10.1177/14687941211039402

Leighton, K., Kardong-Edgren, S., Schneidereith, T., & Foisy-Doll, C. (2021). Using social media and snowball sampling as an alternative recruitment strategy for research. *Clinical Simulation in Nursing*, *55*, 37–42. https://doi.org/10.1016/j.ecns.2021.03.006

Lester, J. N., Cho, Y., & Lochmiller, C. R. (2020). Learning to do qualitative data analysis: A starting point. *Human Resource Development Review*, *19*(1), 94–106. https://doi.org/10.1177/1534484320903890

Li, Y., & Liu, Q. (2021). A comprehensive review study of cyber-attacks and cyber security; Emerging trends and recent developments. *Energy Reports*, *7*, 8176–8186. https://doi.org/10.1016/j.egyr.2021.08.126

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

Lobe, B., Morgan, D., & Hoffman, K. A. (2020). Qualitative data collection in an era of social distancing. *International Journal of Qualitative Methods*, *19*, 1–8. https://doi.org/10.1177/1609406920937875

Lopez, C. T. (2022). U.S. Department of Defense. Article 3039462. https://www.defense.gov/News/News-Stories/Article/Article/3039462/dod-its-not-just-state-actors-who-pose-cyber-threat-to-us/

Mackieson, P., Shlonsky, A., & Connolly, M. (2018). Increasing rigor and reducing bias in qualitative research: A document analysis of parliamentary debates using applied thematic analysis. *Qualitative Social Work*, *18*(6), 965–980. https://doi.org/10.1177/1473325018786996

Marquardson, J., & Elnoshokaty, A. (2020). Skills, certifications, or degrees: What companies demand for entry-level cybersecurity jobs. *Information Systems Education Journal*, *18*(1), 22–28. https://isedj.org/2020-18/n1/ISEDJv18n1p22.html

Martin, Y., & Goldwasser, R. (2022). Employee motivation, job reengineering, and perceived job satisfaction: A quantitative correlational approach. *Business Management Research and Applications: A Cross-Disciplinary Journal*, *1*(1), 60–106. https://doi.org/10.54093/bmra.v1i1.2123

Maxwell, J. A. (2021). Why qualitative methods are necessary for generalization. *Qualitative Psychology*, *8*(1), 111–118. https://doi.org/10.1037/qup0000173

McSweeney, B. (2021). Fooling ourselves and others: Confirmation bias and the trustworthiness of qualitative research – Part 1 (the threats). *Journal of Organizational Change Management*, *34*(5), 1063–1075. https://doi.org/10.1108/JOCM-04-2021-0117

Mehrad, A. (2015). Role of Herzberg motivation-hygiene theory on explanation of job satisfaction among staff at organization. *International Journal of Information Research and Review*, *02*(12), 1491–1492. https://www.ijirr.com/role-herzberg-motivation-hygiene-theory-explanation-job-satisfaction-among-staff-organization

Motulsky, S. L. (2021). Is member checking the gold standard of quality in qualitative research? *Qualitative Psychology*, *8*(3), 389–406. https://doi.org/10.1037/qup0000215

Murray, W. C., & Holmes, M. R. (2021). Impacts of employee empowerment and organizational commitment on workforce sustainability. *Sustainability, 13*(6), Article 3163. http://doi.org/10.3390/su13063163

Mwita, K. M. (2022). Factors influencing data saturation in qualitative studies. *International Journal of Research in Business & Social Science*, *11*(4), 414–420. https://doi.org/10.20525/ijrbs.v11i4.1776

Nakasone, P. M. (2019). A cyber force for persistent operations. *JFQ: Joint Force Quarterly*, *92*, 10–14. https://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-92/jfq-92_10-14_Nakasone.pdf

Nakasone, P. M. (2021). Posture statement of General Paul M. Nakasone Commander, United States Cyber Command before the 117th Congress Senate Armed Services Committee. https://www.armed-services.senate.gov/imo/media/doc/Nakasone_03-25-21.pdf

Nassaji, H. (2020). Good qualitative research. *Language Teaching Research*, *24*(4), 427–431. https://doi.org/10.1177/1362168820941288

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1979). *The Belmont Report: Ethical principles and guidelines for the protection of human subjects of research*. U.S. Department of Health and Human Services. https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/read-the-belmont-report/index.html

National Institute of Standards and Technology. (2021). *Developing cyber-resilient systems: A systems security engineering approach.* Department of Commerce,

Washington, D.C. NIST Special Publication 2, 800–160, Revision 1. https://doi.org/10.6028/NIST.SP.800-160v2r1

Neubauer, B. E., Witkop, C. T., & Varpio, L. (2019). How phenomenology can help us learn from the experiences of others. *Perspectives on Medical Education*, *8*(2), 90–97. https://doi.org/10.1007/s40037-019-0509-2

Nurlina, N. (2022). Examining linkage between transactional leadership, organizational culture, commitment and compensation on work satisfaction and performance. *Golden Ratio of Human Resource Management*, *2*(2), 108–122. https://doi.org/10.52970/grhrm.v2i2.182

Obeng, A. F., Zhu, Y., Quansah, P. E., Ntarmah, A. H., & Cobbinah, E. (2021). High-performance work practices and turnover intention: Investigating the mediating role of employee morale and the moderating role of psychological capital. *SAGE Open.* https://doi.org/10.1177/2158244020988557

Obilor, E. I. (2023). Convenience and purposive sampling techniques: Are they the same? *International Journal of Innovative Social & Science Education Research*, *11*(1), 1–7. https://seahipaj.org/journals-ci/mar-2023/IJISSER/full/IJISSER-M-1-2023.pdf

O'Kane, P., Smith, A., & Lerman, M. P. (2021). Building transparency and trustworthiness in inductive research through computer-aided qualitative data analysis software. *Organizational Research Methods*, *24*(1), 104–139. https://doi.org/10.1177/1094428119865016

Olmos-Vega, F. M., Stalmeijer, R. E., Varpio, L., & Kahlke, R. (2023). A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical Teacher, 45*(3), 241–251. https://doi.org/10.1080/0142159x.2022.2057287

Osborne, S., & Mohamad, S. H. (2017). Effective employee engagement in the workplace. *International Journal of Applied Management and Technology, 16*(1), 50–67. https://doi.org/10.5590/IJAMT.2017.16.1.04

Paais, M., & Pattiruhu, J. R. (2020). Effect of motivation, leadership, and organizational culture on satisfaction and employee performance. *The Journal of Asian Finance, Economics and Business, 7*(8), 577–588. https://doi.org/10.13106/jafeb.2020.vol7.no8.577

Pološki Vokić, N., Tkalac Verčič, A., & Sinčić Ćorić, D. (2023). Strategic internal communication for effective internal employer branding. *Baltic Journal of Management, 18*(1), 19–33. https://doi.org/10.1108/BJM-02-2022-0070

Prentice, S. B. (2022). Job satisfaction or employee engagement: Regardless of which comes first, supportive leadership improves them both. *Advances in Developing Human Resources, 24(*4), 275–285. https://doi.org/10.1177/15234223221112504

Prosek, E. A., & Gibson, D. M. (2021). Promoting rigorous research by examining lived experiences: A review of four qualitative traditions. *Journal of Counseling & Development, 99*(2), 167–177. https://doi.org/10.1002/jcad.12364

Quintão, C., & Andrade, P. (2020). How to improve the validity and reliability of a case study approach. *Journal of Interdisciplinary Studies in Education, 9*(2), 274–285. https://doi.org/10.32674/jise.v9i2.2026

Ramsey, A. A. (2020, April). Talent management for cyber warfare. *Marine Corps Gazette; Quantico*, *104*(4), 56–59. https://mca-marines.org/wp-content/uploads/0420-Talent-Management.pdf

Rashid, Y., Rashid, A., Warraich, M. A., Sabir, S. S., & Waseem, A. (2019). Case study method: A step-by-step guide for business researchers. *International Journal of Qualitative Methods*, *18*. https://doi.org/10.1177/1609406919862424

Reeder, R., & Hall, T. (2021, Summer). Cybersecurity's Pearl Harbor moment: Lessons learned from the Colonial Pipeline ransomware attack. *The Cyber Defense Review*, *6*(3), 15–40.

Rivera, L. A. (2020). Employer decision making. *Annual Review of Sociology*, *46*(1), 215–232. https://doi.org/10.1146/annurev-soc-121919-054633

Roberts, R. E. (2020). Qualitative interview questions: Guidance for novice researchers. *Qualitative Report*, *25*(9), 3185–3203. https://doi.org/10.46743/2160-3715/2020.4640

Rombaut, E., & Guerry, M. A. (2020). The effectiveness of employee retention through an uplift modeling approach. *International Journal of Manpower*, *41*(8). https://doi.org/10.1108/ijm-04-2019-0184

Rose, J., & Johnson, C. W. (2020). Contextualizing reliability and validity in qualitative research: toward more rigorous and trustworthy qualitative social science in leisure research. *Journal of Leisure Research*, *51*(4), 432–451. https://doi.org/10.1080/00222216.2020.1722042

Ross, P. T., & Bibler Zaidi, N. L. (2019). Limited by our limitations. *Perspectives on Medical Education*, *8*(4), 261–264. https://doi.org/10.1007/s40037-019-00530-x

Saarijärvi, M., & Bratt, E. L. (2021). When face-to-face interviews are not possible: Tips and tricks for video, telephone, online chat, and email interviews in qualitative research. *European Journal of Cardiovascular Nursing*, 20(4), 392–396. https://doi.org/10.1093/eurjcn/zvab038

Sadaf, M., & Mukhtar, U., & Nemati, A., Yousaf, R., & Javed, W. (2022). Impact of organizational value system, perceived organizational support, and job satisfaction on organizational commitment. *Journal of Entrepreneurship, Management, and Innovation*, *4*, 71–99. https://doi.org/10.52633/jemi.v4i1.151

Şahin, M. D., & Öztürk, G. (2019). Mixed method research: Theoretical foundations, designs and its use in educational research. *International Journal of Contemporary Educational Research*, *6*(2), 301–310. https://doi.org/10.33200/ijcer.574002

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2015). *Research methods for business students* (7th ed.). Pearson Education Unlimited.

Schneider, J. (2020). A strategic cyber no-first-use policy? Addressing the US cyber strategy problem. *The Washington Quarterly*, *43*(2), 159–175. https://doi.org/10.1080/0163660X.2020.1770970

Schultheiss, T., Pfister, C., Gnehm, A.-S., & Backes-Gellner, U. (2023). Education expansion and high-skill job opportunities for workers: Does a rising tide lift all

boats? *Labour Economics*, *82*, Article 102354. https://doi.org/10.1016/j.labeco.2023.102354

Sefidan, S., Pramstaller, M., La Marca, R., Wyss, T., Roos, L., Sadeghi-Bahmani, D., & Brand, S. (2021). Transformational leadership, achievement motivation, and perceived stress in basic military training: A longitudinal study of Swiss Armed Forces. *Sustainability*, *13*(24), Article 13949. https://doi.org/10.3390/su132413949

Shaw, R. M., Howe, J., Beazer, J., & Carr, T. (2019). Ethics and positionality in qualitative research with vulnerable and marginal groups. *Qualitative Research, 20*(3), 277–293. https://doi.org/10.1177/1468794119841839

Shin, D., & Alam, M. S. (2020). Lean management strategy and innovation: moderation effects of collective voluntary turnover and layoffs. *Total Quality Management & Business Excellence*, *33*(1/2), 202–217. https://doi.org/10.1080/14783363.2020.1826923

Simić, I. (2020). Are managers and leaders one and the same? *Ekonomika*, *66*(3), 1–13. https://doi.org/10.5937/ekonomika2003001s

Sims, D., & Cilliers, F. (2023). Qualitatively speaking: Deciding how much data and analysis is enough. *African Journal of Health Professions Education*, *15*(1), 2–3. https://doi.org/10.7196/AJHPE.2023.v15i1.1657

Singh, D. (2019). A literature review on employee retention with focus on recent trends. *International Journal of Scientific Research in Science, Engineering and Technology*, 425–431. https://doi.org/10.32628/ijsrst195463

Skelton, A. R., Nattress, D., & Dwyer, R. J. (2019). Predicting manufacturing employee turnover intentions. *Journal of Economics, Finance and Administrative Science*, *25*(49), 101–117. https://doi.org/10.1108/jefas-07-2018-0069

Soh, S. L. H., Lane, J., & Tan, C. W. (2020). Researcher as instrument: A critical reflection using nominal group technique for content development of a new patient-reported outcome measure. *International Practice Development Journal*, *10*(2), 1–9. https://doi.org/10.19043/ipdj.102.010

Sopiah, S., Kurniawan, D. T., Nora, E., & Narmaditya, B. S. (2020). Does talent management affect employee performance?: The moderating role of work engagement. *The Journal of Asian Finance, Economics and Business, 7*(7), 335–341. https://doi.org/10.13106/jafeb.2020.vol7.no7.335

Srivastava, S., & Agrawal, S. (2020). Resistance to change and turnover intention: A moderated mediation model of burnout and perceived organizational support. *Journal of Organizational Change Management, 33*(7), 1431–1447. https://doi.org/10.1108/jocm-02-2020-0063

Stewart, B., & Agrawal, R. (2021, Summer). OverSTEMulated. *Air & Space Power Journal, 35*(2), 55–67. https://www.airuniversity.af.edu/Portals/10/ASPJ/journals/Volume-35_Issue-2/F_Stewart_Agrawal.pdf

Sussman, L. L. (2021). Exploring the value of non-technical knowledge, skills, and abilities (KSAs) to cybersecurity hiring managers. *Journal of Higher Education Theory and Practice, 21*(6), 99–117. https://doi.org/10.33423/jhetp.v21i6.4379

Syahrul, S., & Suryadi, S. (2021). Organizational culture dimensions in the management of PM Gontor 7 Putera, Southeast Sulawesi. *Al-Izzah: Jurnal Hasil-Hasil Penelitian* [Journal of Research Results], *1*, 1–13. https://doi.org/10.31332/ai.v0i0.2492

Tamunomiebi, M. D., & Okwakpam, J. A. (2019). Effective succession planning: A roadmap to employee retention. *Kuwait Chapter of Arabian Journal of Business and Management Review, 8*(2), 1–10. https://doi.org/10.12816/0055330

Tao, A. K., & Campbell, J. W. (2020). Veterans and job satisfaction in U.S. federal government: The importance of role clarity on the first years of civilian employment. *Public Personnel Management, 49*(3), 508–531. https://doi.org/10.1177/0091026019878210

Thant, Z. M., & Chang, Y. (2021). Determinants of public employee job satisfaction in Myanmar: Focus on Herzberg's two factor theory. *Public Organization Review, 21*(1), 157–175. https://doi.org/10.1007/s11115-020-00481-6

Thompson, J. R. (2020). Civil service reform is dead: Long live civil service reform. *Public Personnel Management, 50*(4), 584–609. https://doi.org/10.1177/0091026020982026

Thunberg, S., & Arnell, L. (2021). Pioneering the use of technologies in qualitative research – A research review of the use of digital interviews. *International Journal of Social Research Methodology*, *25*(6), 757–768. https://doi.org/10.1080/13645579.2021.1935565

Tirta, A. H., & Enrika, A. (2020). Understanding the impact of reward and recognition, work-life balance, on employee retention with job satisfaction as mediating variable on millennials in Indonesia. *Journal of Business and Retail Management Research, 14*(3), 88–99. https://doi.org/10.24052/jbrmr/v14is03/art-09

Tomaszewski, L. E., Zarestky, J., & Gonzalez, E. (2020). Planning qualitative research: Design and decision making for new researchers. *International Journal of Qualitative Methods, 19*, 1–7. https://doi.org/10.1177/1609406920967174

Urias, V. E., Stout, W. M., Van Leeuwen, B., & Lin, H. (2018, October 22–25). *Cyber range infrastructure limitations and needs of tomorrow* [Position paper]. International Carnahan Conference on Security Technology (ICCST), Montreal, QC, Canada. https://doi.org/10.1109/ccst.2018.8585460

U.S. Government Accountability Office (GAO). (2021, March). *High-risk series: Dedicated leadership needed to address limited progress in most high-risk areas* (Report No. GAO-21-119SP). https://www.gao.gov/assets/gao-21-119sp.pdf

U.S. Office of Personnel Management. (n.d.-a). *Agency overview.* Retrieved March 15, 2023, from https://www.opm.gov/about-us/strategic-plan/agency-overview/#:~:text=The%20U.S.%20Office%20of%20Personnel,they%20serve%20the%20American%20people

U.S. Office of Personnel Management. (n.d.-b). *Human resources flexibilities and authorities in the federal government.* Retrieved December 1, 2023, from https://www.opm.gov/policy-data-oversight/pay-leave/reference-materials/handbooks/humanresourcesflexibilitiesauthorities.pdf

U.S. Office of Personnel Management. (n.d.-c). *Retention incentives likely to leave the Federal service.* Retrieved December 1, 2023, from https://www.opm.gov/policy-data-oversight/pay-leave/recruitment-relocation-retention-incentives/fact-sheets/retention-incentives-likely-to-leave-the-federal-service/#:~:text=An%20agency%20may%20unilaterally%20terminate%20a%20retention%20incentive%20based%20solely,no%20service%20agreement%20is%20required

van Manen, M., & van Manen, M. (2021). Doing phenomenological research and writing. *Qualitative Health Research, 31*(6), 1069–1082. https://doi.org/10.1177/10497323211003058

Verčič, A. T. (2021). The impact of employee engagement, organisational support and employer branding on internal communication satisfaction. *Public Relations Review*, *47*(1), Article 102009. https://doi.org/10.1016/j.pubrev.2021.102009

Veshne, N. A., & Munshi, M. M. (2020). Enhancing employee engagement through emotionally intelligent leaders. *Srusti Management Review*, *13*(2), 32–39. http://www.srustimanagementreview.ac.in/paperfile/544313466_Enhancing%20Employee%20Engagement%20through%20Emotionally%20Intelligent%20L.pdf

Virgiawan, A., Riyanto, S., & Endri, E. (2021). Organizational culture as a mediator of motivation and transformational leadership on employee performance. *Academic Journal of Interdisciplinary Studies*, *10*(3), 67–79. https://doi.org/10.36941/ajis-2021-0065

White, M. G. (2020). Why human subjects research protection is important. *The Ochsner Journal*, *20*(1), 16–33. https://doi.org/10.31486/toj.20.5012

Whysall, Z., Owtram, M., & Brittain, S. (2019). The new talent management challenges of Industry 4.0. *Journal of Management Development*, *38*(2), 118–129. https://doi.org/10.1108/JMD-06-2018-0181

Wiles, R. (2013). *What are qualitative research ethics?* Bloomsbury Academic. https://doi.org/10.5040/9781849666558

Williams, J. C., & Mihaylo, S. (2019). How the best bosses interrupt bias on their teams: strategies to foster equity and inclusion. *Harvard Business Review*, *97*(6), 151–155.

Williams, J. R. I., Clark, L. A., Clark, W. R., & Raffo, D. M. (2021). Re-examining systematic literature review in management research: Additional benefits and execution protocols. *European Management Journal*, *39*(4), 521–533. https://doi.org/10.1016/j.emj.2020.09.007

Williams, M., & Moser, T. (2019). The art of coding and thematic exploration in qualitative research. *International Management Review*, *15*(1), 45–55.

Williams-McBean, C. T. (2019). The value of a qualitative pilot study in a multi-phase mixed methods research. *The Qualitative Report*, *24*(5), 1055–1064. https://doi.org/10.46743/2160-3715/2019.3833

Winger, G., Ellis, S., & Glover, D. (2023). Bridging the digital gap: Teaching cyber strategy and policy through a crisis simulation. *International Studies Perspectives*, *24*(3), 285–307. https://doi.org/10.1093/isp/ekad001

Xu, A., Baysari, M. T., Stocker, S. L., Leow, L. J., Day, R. O., & Carland, J. E. (2020). Researchers' views on, and experiences with, the requirement to obtain informed consent in research involving human participants: A qualitative study. *BMC Medical Ethics*, *21*(1), 1–11. https://doi.org/10.1186/s12910-020-00538-7

Yin, R. K. (2016). *Qualitative research from start to finish* (2nd ed.). The Guilford Press.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.

Zhenjing, G., Chupradit, S., Ku, K. Y., Nassani, A. A., & Haffar, M. (2022). Impact of employees' workplace environment on employees' performance: A multi-mediation model. *Frontiers in Public Health, 10,* Article 890400. https://doi.org/10.3389/fpubh.2022.890400

Zilberman, A., & Ice, L. (2021). Employment and unemployment: Why computer occupations are behind strong STEM employment growth in the 2019–29 decade. *Bureau of Labor Statistics: Beyond the Numbers, 10*(1). https://www.bls.gov/opub/btn/volume-10/why-computer-occupations-are-behind-strong-stem-employment-growth.htm

Zimmerman, R. D., Swider, B. W., & Boswell, W. R. (2018). Synthesizing content models of employee turnover. *Human Resource Management*, *58*(1), 99–114. https://doi.org/10.1002/hrm.21938

Appendix: Interview Protocol

1. Welcome the participant and encourage them to get comfortable.
2. Review the purpose of the interview.
3. Provide the consent form, encourage questions, and confirm understanding.
4. Request permission to begin audio recording.
5. Identify participants on the recording based on the predetermined identifier, followed by date, time, and location.
6. Begin the interview, reading each question the same with each participant.
7. Give the participant time to think and respond.
8. Ask follow-up questions when needed.
9. Schedule member checking.
10. Thank participants for their time and willingness to contribute.