

Exploring the Unique Skills and Challenges Veterans with Disabilities Bring to College: A Qualitative Study in Engineering

Mr. Michael Scott Sheppard Jr., Arizona State University

Michael Scott Sheppard is a graduate research associate pursuing a Master of Science degree in Engineering and a Ph.D. in Engineering Education Systems and Design at Arizona State University. He received a Bachelor of Science in Biomedical Science degree from Lynchburg College in 2002, after which he served in the military for six years as a Special Amphibious Reconnaissance Corpsman (SARC) at the 2nd Force Reconnaissance Company. Following military service, Michael obtained a Bachelor of Science in Engineering degree from Arizona State University, graduating in 2013. His research and service interests include veterans in engineering, veterans with service-connected disability, post-traumatic stress disorder (PTSD), and human sex trafficking.

Dr. Nadia N. Kellam, Arizona State University

Dr. Nadia Kellam is Associate Professor in the Polytechnic Engineering Program at Arizona State University. Prior to this position, she was an Associate Professor at the University of Georgia, where she was co-director of the interdisciplinary engineering education research Collaborative Lounge for Understanding Society and Technology through Educational Research (CLUSTER). In her research, she is interested in understanding how engineering students develop their professional identity, the role of emotion in student learning, and synergistic learning. A recent research project uncovers the narratives of exemplary engineering faculty who have successfully transitioned to student-centered teaching strategies. She co-designed the environmental engineering synthesis and design studios and the design spine for the mechanical engineering program at UGA. She is engaged in mentoring early career faculty at her university and within the PEER National Collaborative. In 2013 she was selected to be a National Academy of Engineering Frontiers of Engineering Education Faculty Member.

Dr. Samantha Ruth Brunhaver, Arizona State University

Dr. Samantha R. Brunhaver is an Assistant Professor within The Polytechnic School, one of six schools in the Ira A. Fulton Schools of Engineering at Arizona State University. She is a mixed-methods researcher with focus on the preparation and pathways of engineering students. Her specific research interests include engineering student persistence and career decision-making, early career engineering practice, faculty pedagogical risk-taking, and entrepreneurial mindset. She completed her B.S. in Mechanical Engineering at Northeastern University and her M.S. and Ph.D. in Mechanical Engineering at Stanford University. Prior to ASU, she worked as an engineer at A. W. Chesterton, Boston Scientific, and Procter & Gamble.

Exploring the Unique Skills and Challenges Veterans with Disabilities Bring to College: A Qualitative Study in Engineering

Abstract

Military careers and student life have stark differences. No matter each veteran's military experiences, the transition from military to college may be fraught with unexpected challenges. Student veterans with disabilities may face additional challenges that uniquely differentiate them from other students. This exploratory research study aims to develop a deeper understanding of the experiences of engineering student veterans with service-connected disabilities as they transition into higher education. To investigate these transitions, we utilized semi-structured narrative interviews with three sophomore engineering students, each with levels of service-connected disability exceeding 30 percent and purposively selected for maximum variability across particular demographic characteristics. In this thematic analysis, we explored the rich narratives of the students' transitions from military service to becoming undergraduate engineering students by organizing the themes as they mapped to the Schlossberg Transition Theory. Analysis of the interview data showed that student veterans with disabilities face unique challenges both inside and outside the classroom due to dramatic changes in their social support systems and the existence of service-connected disability. However, these students aspire to be successful against all odds, have an elevated work ethic, and employ a heightened level of leadership, teaming, and communication. These assets can be invaluable for student veterans and their peers as they pursue careers in engineering. Results thus indicate that student veterans' military time and training do lend themselves as useful tools in navigating the transition to undergraduate engineering and ensuring success as engineering students. The identification of these unique skills and challenges affords us a better chance to understand these aspects of transition and to facilitate change that better supports future student veterans with disabilities.

Keywords student veterans; service-connected disability; Schlossberg Transition Theory

Introduction

There is a dearth of knowledge surrounding the transition of veterans with disabilities into undergraduate engineering. Despite the support of the Veterans Administration, which provides a variety of benefits including healthcare, vocational rehabilitation, and tuition assistance, in addition to the academic institutions and support networks surrounding these student veterans, moving from a military lifestyle to that of a student can be a massive undertaking, especially when a veteran has a military service-connected disability. Depending on each individual veteran's prior military jobs and experiences, a transition of this nature may be simple and straightforward or fraught with unexpected challenges. Individuals with a history of dangerous professions, like military service members, can develop mental and emotional adaptations that were beneficial during their time of service but may become detrimental once removed from warfare [1].

Military careers and student life have stark differences. For example, the military is full of imposed structural guidelines that service members are required to follow or they will face

punitive actions, whereas the student lifestyle is full of choices that may affect grades, but few will result in consequences as severe as a loss of pay, decrease in rank, or even loss of life. After becoming accustomed to rigorously imposed structure within the military, service members may face challenges when forced to create their own routines as students. Also, many military members have built robust support systems within their companies, platoons, and units; in the shift from life in the military to life as a student, they may experience a loss of support or sense of belonging [2].

With the introduction of the Post 9/11 GI Bill on August 1, 2009, veterans have been attending undergraduate programs at historically high rates [3]. From 2008 to 2011, almost 500,000 people have utilized Post 9/11 GI Bill funding to attend undergraduate programs [3] and these numbers are continuing to increase. Along with this increase in the student veteran population there has been an increase in student veterans with disabilities [1].

This massive influx of veterans with disabilities into college [4] is due not only to an increase in student veterans, but also to an increase in war-related injuries that result in lifelong service-connected disabilities. Not only are there visible disabilities, but invisible disabilities, such as Post Traumatic Stress Disorder (PTSD) and Traumatic Brain Injury (TBI), which are now prevalent among veterans returning from foreign wars [4]. People, including veterans transitioning into undergraduate engineering programs, learn and grow from their experiences, which may help or hinder them in future pursuits [5]. This is no different for these student veterans with disabilities, but, in many cases, their disabilities may pose unique challenges to their success as a student.

Student veterans with service-connected disabilities may face unique challenges that differentiate them from student veterans without disabilities and from other students. Alternatively, they may find themselves better suited than others to conquer the challenges of an undergraduate engineering program. The purpose of this exploratory research study is to develop a deeper understanding of the experiences of student veterans with disabilities in engineering as they transition into higher education. The research questions for this study are as follows:

1. In what ways have the military experiences of veterans with service-connected disabilities shaped their transition from the military to becoming an engineering student?
2. What have been the social and academic experiences of the student veterans with service-connected disabilities in their engineering program?

Literature Review

Unique Challenges of Student Veterans with Disabilities

Research has been conducted to better understand the experiences of veterans transitioning into higher education [6], showing that there remains a question of whether successes are due to nontraditional student status such as age, family obligations, and employment versus experiential learning from military services. However, little has been done to explore the role of service-connected disabilities and their effect on this transition. Veterans with disabilities face unique challenges that other veterans do not experience as they reintegrate into society [7]. For example,

student veterans with disabilities may experience emotional instability, discomfort in large crowds, discomfort in closed off spaces such as classrooms [9]-[11], physical discomfort or pain due to physical disability [11], and significantly increased risk of suicide [12]. Academic institutions need to be ready to address these unique challenges with increases in academic support, emotional counseling, and other programs designed to assist students across a wide variety of physical and emotional disabilities [1], [10]. Another exacerbating factor for student veterans with disabilities is other people's perception of individuals with disabilities [4]. There is a social stigma surrounding people with emotional and cognitive disabilities like PTSD and TBI. Often, they are seen as being mentally deficient or unintelligent because of generalizations made from exaggerated public cases.

Unique Skills of Student Veterans with Disabilities

Past research has focused on the deficits of student veterans with disabilities and how they need to be better supported by the administrators and faculty members of academic institutions [1], [7], [10], [13]. However, student veterans' disability status does not negate the unique skills and positive attributes acquired during military service. Student veterans, including student veterans with disabilities, may find themselves better suited than others to conquer the challenges of an undergraduate engineering program [5], [6], [11]. Due to extensive training, operations, and experiences that 99% of the people living in the United States have never encountered [14], veterans in engineering have the capacity to bring new skillsets, thought processes, and problem-solving techniques to the engineering community [15].

Main et al. [7] found that, while many of the student veterans participating in their study of veteran pathways in engineering education attributed skills learned in the military for their academic success, they could not definitely conclude whether these skills were primarily attributable to military experience or to the participants' age and non-traditional student status. Our study seeks to expand upon past research by further exploring the valuable relationships between military experiences and the transition from soldier to student, while also investigating the inherent challenges for student veterans with service-connected disabilities.

Theoretical Framework

The focus of this study is on the transitions of student veterans from their military careers to engineering school. Because Schlossberg's theory deals with issues of transition, this theoretical framework was selected as it is appropriate to guide the interview questions and inform the coding of the data. Previous studies have used The Schlossberg Transition Theory when examining veterans' transitions into undergraduate engineering [16], [17], and its representation of the transition process as a series of 4S's, including Self, Situation, Social Support, and Strategies [18]. It is important to note that the framework is one model of the transition process and that as few or as many S's as are deemed appropriate can be used to describe the transition process. Figure 1 provides a visual representation of the cyclic nature of a transition and the four main aspects of this theoretical framework.

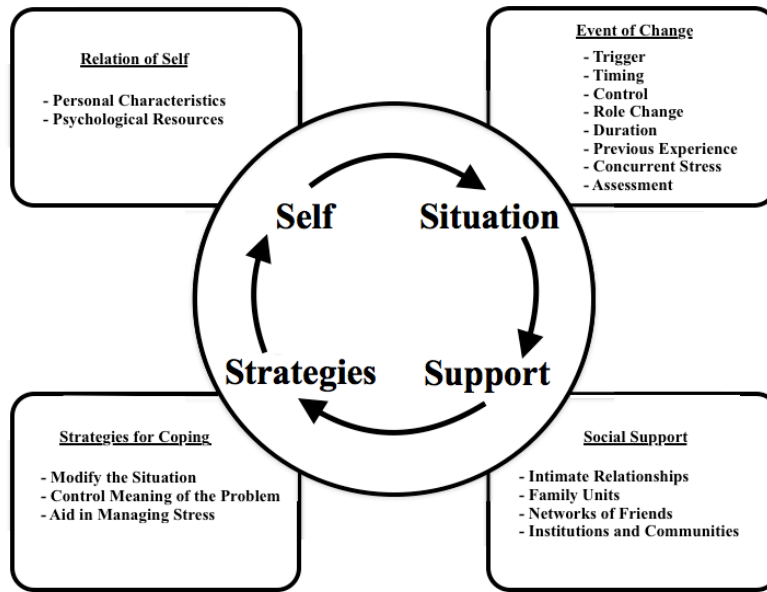


Figure 1: The Schlossberg Transition Theory Framework (adapted from Schlossberg, 1981).

Each S within this framework addresses an aspect of transition. *Self* describes personal characteristics of one’s image and their psychological resources. It also includes demographic characteristics, perceptions of themselves, and their value systems. *Situation* is rooted more in the actual transition and the changes that are occurring. This is typically a feature describing the triggers, changes, and stresses of the transitional experience. *Social Support* includes support structures such as family, friends, mentors, and support from institutions. These are the people or things that provide care and encouragement throughout the transition. *Strategy* involves a focus on the actions, interactions, interventions, and tactics that are utilized to overcome the challenges of transition and move people in transition toward their next state of being [19].

The Schlossberg Transition Theory Framework will be used to organize and better understand the emergent themes during the analysis phase of this project. This theoretical framework provides a structure that assists in the weaving of these themes into a cohesive story of veterans transitioning into undergraduate engineering programs.

Methods

Research Site

This study focuses on undergraduate student veterans currently enrolled in the Ira A. Fulton School of Engineering at Arizona State University (ASU). As one of the largest institutions in the country, ASU has about 3,400 students who are military veterans [19]. Arizona State University earned a “gold” rating as a military friendly academic institution, placing it at the top of more than 1,400 other surveyed colleges [20], and it was ranked in the top ten percent of more than 5,300 colleges and universities as being recommended for veterans in [21]. This military friendly status makes ASU an ideal location to utilize as a research site. Due to the location and potential ease of access to student veterans, I (first person accounts are those of Michael Sheppard, the first author of this paper) conducted this study on the Polytechnic Campus in close

proximity to my area of academic operations, which afforded me a still-sizable population of undergraduate engineering students whom are also veterans with disabilities. Engineering students on this campus are part of the General Engineering or Manufacturing Engineering program within The Polytechnic School within ASU's Ira A. Fulton Schools of Engineering.

Participants and Recruitment

This study employed purposive sampling [22] to select three participants with maximum variability in their demographic characteristics. According to Creswell [22], maximum variability draws out the greatest variety from the least number of participants in the hopes of providing the richest illustration of the phenomenon. The three participants were selected based on the variability of demographics such as race, gender, age, and military profession. For this study, one sought after trait was the existence of service-connected disability over 30%, which was present across all participants. As per the Veterans Administration, service-connected disability over 30% assigns a designation of disabled veteran to the individual in question [3]. Along with the aforementioned demographic requirements, the participants had to be currently enrolled in the Ira A. Fulton Schools of Engineering and hold sophomore student standing. Sophomore status was of import to make sure that the student veterans had adequate student experience without being too far removed from their military time and initial transition into student status.

To recruit participants, I visited all 200-level engineering project courses within the General Engineering or Manufacturing Engineering program. In each course, I took a few minutes to introduce myself to the class, familiarize the students with my area of research, and explain the study for which I was recruiting participants. Following this face-to-face engagement with the students, recruitment e-mails were sent to the instructors of these courses, inviting them to share an online demographic survey, approved by the IRB, with their students. As students completed the demographic surveys, I reviewed the results and made selections participants with maximum variability. Three students were selected to achieve the desired level of demographic variability within the sample. Participants were within 25 and 30 years of age. They represented both male and female gender, three different ethnicities, two different branches of the military, three different careers within their military time, two non-combatants and one combat veteran. All three student veterans were also awarded service-connected disability greater than 30%. Each participant was then contacted to participate in an interview, and interviews were scheduled within seven days of survey completion. All of participant demographic information can be seen in Table 1.

Table 1: Participant Demographics

Participant, Pseudonym	Age Range	Gender	Ethnicity	Branch of the Military	Military Position	Involved in Combat?	Service Connected Disability
Monica	25-30	Female	Hispanic	Navy	Electrician	No	80%
Sean	25-30	Male	Caucasian	Navy	Mechanic	No	50%
Jon	25-30	Male	Asian	Marine Corps	Infantry	Yes	80%

Data Collection

Data was collected through 60-minute, semi-structured phenomenological interviews conducted in a private room in the campus library. The interview questions were developed from the research questions and aligned with Schlossberg's 4S Transition Theory [19]. The open-ended categories for the interview questions were as follows:

- Engineering experiences
- Military experiences
- Transitional experiences
- Comparisons to peers

The interview itself began in an open-ended engagement where the participants were prompted with the follows spoken verbiage:

I'm interested in hearing your story of how you got to where you are today. Feel free to go back as far as you like. What are the experiences that helped steer you to where you are as an engineering student? Consider the full spectrum of experiences; these could be from childhood, family interactions, interactions with friends, work experiences, etcetera. Along with this larger story I'm interested in how your military experiences played a role in getting you to this point.

The participants then told their story as they remembered it, speaking anywhere from 15 minutes to 30 minutes. I wrote probe reminders and field notes for myself as the participants continued their story. Following their open dialogue, I probed certain statements that required more clarity and also referenced their statements to steer the conversation toward unanswered interview questions. Aside from the narrative-style protocol, interview questions were designed to map back to the Schlossberg Transition Theory. For example, the following questions are associated respectively with the *Situation* and *Strategy* of the transition theory:

- How would you describe this transition from the military lifestyle to that of student life?
- Did you go through any of the other programs that are intended to help prepare you for school after the military?
 - Probe if yes. How was that course helpful in entering academia?
 - Probe if no. In what ways did you prepare to go to school after leaving the military?

The interview protocol with all topics and subtopic probes can be seen in Appendix A. Interviews were single session and were recorded with two separate audio recording devices and later transcribed into typed text by the first author.

Analytical Procedures

Preliminary analysis began with the use of *in vivo* and descriptive coding. *In vivo* coding entails codes that are direct quotes to excerpts while descriptive coding summarizes passages in a word or short phrase [23, p. 105]. Based on the initial *in vivo* and descriptive coding, a total of 13 provisional codes were generated [23, p. 168]. These provisional codes were used to complete a

first cycle of coding for the three transcripts. Due to differences in the data between transcripts, eight additional provisional codes were added to the codebook before the completion of first cycle coding [11]. Following the initial coding of the transcripts, I conducted code mapping [23, p. 218] to reorganize codes into categories and pattern coding [23, p. 236] to group the categories into more specific themes. What resulted from this iterative process mapped well to the Schlossberg Transition Theory [18]. I found that all of the codes had an appropriate place within this theoretical framework, lending more evidence that it should be suitable for answering my research questions and elucidating this complex phenomenon.

Reflexivity

My reflexivity will be both a great strength and a great challenge as the study is conducted for several reasons [24]. First, I am a member of the population I am studying. I am a veteran of the United States Navy, and, following my military service, I began pursuing my undergraduate degree in engineering. I have very vivid memories of my military experience. These experiences have had a clear effect on my studies in engineering, and I expect the same may be true for my fellow veterans who have also decided to pursue undergraduate degrees in engineering. In fact, my contemplation and reflection of how experiences following my military career affected my studies drives this very research. I have been utilizing my experiences from military service, engineering academic studies, and time working in the engineering and education industry to better understand the transition from active duty military member to engineering student. Ultimately, it is my hope that my experiences have offered a unique approach to this study and thereby benefit veterans seeking engineering degrees.

Validity and Reliability

Due to commonalities in our backgrounds, my hope is that common experiences foster a sense of trust and shared understanding with the participants involved in my research during the interviews. However, there is also potential for personal bias and the possibility that I might take for granted certain themes, given that I am also a veteran who has transitioned into an engineering program. I took steps to ensure my experiences did not spill into the participants' narratives and throughout the iterative coding process, I met with my peers within the research team to discuss findings. To ensure validity and reliability, I used member checking [23, p. 37], shoptalk, and inter-coder reliability [23, p. 231]. Respectively, some of the participants were consulted to validate initial findings, the emergent themes were discussed with members of the research team to confirm the absence of prejudice and discuss analytic quandaries, and the coding was evaluated for agreement across research team members.

It should be noted that portions of the interview transcripts were heavily laden with expletives and verbal pauses. In the instances where these portions would appear as document excerpts the verbiage was cleaned up to improve readability. Verbal pauses were removed and the first vowel of each expletive were substituted with asterisks. Even with the removal of verbal pauses the messages conveyed by these passages remains unchanged.

Findings

The study strives not only to understand the experiences of the veteran students, but also to determine the connections and dissimilarities between the participants. This study strives to discover a connection between the participants while still differentiating their individual narratives.

The participants in this study have all gone through or continue to go through the transition from active military service to being undergraduate engineering students. They have had to move from an environment of enormous structure and routine, and from one of great support and camaraderie. Because of this dramatic shift in environment the Schlossberg's 4S Transition Theory [19] was used to identify and analyze emergent themes that led to a better understanding of the unique skills and challenges that may affect these student veterans' abilities to become successful engineering students and civilian members of society. As stated, these student veterans face unique challenges, but are also armed with unique skills and knowledge. There is much value to gain by identifying the strengths and weaknesses of these student veterans in order to better facilitate veteran pathways and mitigate challenges.

Challenges related to disability (Self)

All of the participants in this study are student veterans with service-connected disabilities. Each participant holds a different level and type of disability, and these disabilities affect each of them in a different manner. Some report physical pain that inhibits their attention in class like Monica.

I get these really severe migraines and I have ridiculous insomnia. Other than that, the rest of my disabilities are physical things, like my knees, my shoulders, and, I severely damaged my back. It's uncomfortable for me to sit in super long lectures.

Sean did not report any physical disabilities, but did mention that he has trouble sleeping. He believes that this lack of rest causes problems with course preparation.

The difficulty it causes is obvious because it's sleep apnea. But the effect that it has is, you know, any good studying thing. They'll tell you that instead of binge studying the night before just get a good night's sleep. It helps to get that good night's sleep, you know? And so, it's one of those things where it's not going to affect engineering directly. It's just a school thing in general.

Jon reports more of an emotional response to his service-connected disability. He is ashamed of his high level of disability and is hesitant for others to find out that he is a veteran with disabilities because of what he perceives their reactions may be. This is a unique problem that student veterans with disabilities must face on a daily basis. Jon stated:

I remember the first year I was going to school and there were a couple of cute girls and I was like "Oh f*ck yeah!" I just got back from Afghan so I had all that Afghan f*cking memorabilia in my f*cking room. I have a bad back now and f*cking I can't hear out of one ear. And then they start treating you like one of those f*cking crazy dudes that you

see in the movies. Guys just like PTSD f*cked up, like digging a fighting hole in his f*cking back yard drunk as sh*t. And I'm like God damn it. I'm not that dude. I went through some sh*t, but I'm not going to wig out on you, you know? And so, I guess that would be my biggest issue. I guess when people start asking that question [about disability], it's like f*ck dude, I don't want to f*cking tell them because I don't want them to think this of me, as being that f*cking weak ass weirdo.

Jon later stated that he feels anyone, especially veterans, that may find out about his high level of disability will either think he is “broken” or a liar attempting to receive increased disability compensation. These physical and emotional challenges can be a large barrier to academic and social success, as demonstrated above.

Challenges related to social disconnect (Situation)

Social disconnect is a theme that emerged in the interviews. The participants do not seem to be making friends with the other traditional students they interact with in their daily lives. This disconnect may be due to a perceived loss of social support as Jon often mentions that he misses the brotherhood of his wartime platoon and highlights the lack of people to whom he feels he can relate due to the absence of common combat experiences similar to those he endured. He seems to have fallen back into a solitary life where each day is a routine of school, exercise, and television, unless engaged in a required academic teaming activity. Jon discusses this routine in the excerpt below.

Jon: I guess the biggest one [difference] I already said, as far as transitioning, [was] just having that support system I guess.

Interviewer: The lack of the brotherhood [mentioned earlier in the interview]?

Jon: Yeah, it's the f*cking big one for sure. I can deal with all this f*cking homework. Sucks, you know? It's taking me forever or it takes me forever to learn this concept, but it sucks. We just do all that [and] at the end of the day [I] just f*cking sit at my house watching f*cking Netflix for the eight billionth time.

Sean, who misses the structural support of being enlisted in the military seemed to harbor animosity to those student peers around him. He attributed their lack of work ethic to a lack of structure and consequences beyond poor grades enforced by superiors.

So, coming out of the military, where you know there's a certain level of excellence for people, even your sh*ttiest sh*t bag is still better than 90 percent of your civilians. You know that. Doing project courses with 18 and 19-year-olds, it's a little rough and trying to adjust to the fact that I can't just deny you liberty [time outside of work] and you can stay here until you f*cking do [your job] makes trying to manage these people and trying to get them to do stuff very difficult. You know, I'm getting a little bit better as I'm starting to know more people I have classes with. I'm actually being able to get in groups with people that I know actually do their job, which helps tremendously. I'm in 202 right now, and I think this is the first time that I've had a group that everybody actually shows up.

Throughout Sean's military service he grew an expectation of what he believed working in a team should be like. He believes that his student peers do not meet that expectation and, due to this belief, he sees them as subpar. Because of his opinions of civilians, Sean spends his time focused on his studies and his civilian job, but not on social activities with peers. Noted above, he comments on two years into his plan of study being the first time his entire team has even shown up to work together.

Need for local community (Support)

The findings show that even schools with veteran centers providing academic assistance, professional development, social activities, and other forms of support, such as Arizona State University and the Pat Tillman Veterans Center, may not have the reach to accommodate all of the student veterans. This can especially be the case in large universities that have multiple campuses. The veteran center may be large and heavily involved in providing support to those that choose to ask for it, but this assistance may be constrained to the geographic location of the center. The existence of a veteran center does not mean that it will serve the needed levels of student veteran support. An increase in resources may be needed. Monica explained,

We have the Veteran's Center and that's, I hate to say this because it's just not a bad place, but I feel like that's just kind of their go to. "Oh, you're a veteran? The Pat Tillman Center, they've got you." It's a catch-all. Like, they've got you and they can't handle everything, and they don't have all the resources.

The participants also mentioned that the events produced by the veteran center were usually specific to the campus it was located on, which limited their involvement. Sean stated his disappointment with the orientation he experienced and an interest in meeting people through veteran center activities but complained that there were no activities that afforded him the chance to bond with people before the start of the semester.

The orientation for veterans is a waste of f*cking time. A bunch of 18-year-olds. And, the thing that [one student] wanted to legitimately ask [was], "Is it ok if we have females in our dorm rooms?"

Later in the interview, Sean elaborated,

I want a way for an orientation to happen and maybe a couple extra [activities], to make a friend or something. So, you kind of can build that support group and get to the point where people can actually form a friendship. Like friendships and bonds before the semester, start that initial year so that you're more comfortable with a support structure because there are people that you can be friends with. They're not just classmates, even if it's somebody you don't have a single class with, you know? I guess that's one big thing that I would recommend.

The lack of local social activities was not exclusive to Sean's interview data. Jon also spoke to the effect that he would like to be more involved and meet more student veterans, but the

location of the activities serves as a barrier to involvement.

So, I don't really go out of my way. Even though in the back of my mind I'm like, dude, you probably should because they have veteran meet-ups and stuff like that.

While Jon still felt removed from veterans that did not share experiences similar to his, he stated that he would be interested in socializing with other student veterans if the right activities were facilitated. However, according to both Sean and Jon, these activities were not offered often, and the activities themselves did not seem designed for students of their age. For example, Jon and Sean were uninterested in going to an ice-cream social because they saw it as juvenile. Jon explained,

This weekend we're all gonna go to a bar or do more adult type stuff. People that are in our age group do not f*cking like f*cking free cookies in front of the gym or something like that, you know? Yeah. Like, here's the f*cking ice cream bars. Dude, I don't want to [participate].

Both Sean and Jon also stated that they would have enjoyed a social outing they perceived as being designed for adults.

Even like a monthly thing, you know? Hey, we're just going to go meet up at some place where we were going to do something cool. We're not going to do some g*y sh*t.

Military skills and veteran peers (Strategy)

Along with the unique challenges that student veterans face are the unique contributions that they can bring to the field of engineering as students and eventually as professionals. The participants reported many lessons learned while enlisted in the military, such as technical skills that they can utilize within their programs of study. There were also lessons around collaboration that typically only come with age and experience. Monica explained,

I've had really great mentors, and I think my last Chief was probably one of the best mentors I've had, as far as in my military career, where he sat me down and [said], "whatever you do here, from now on inside the military, you can't do it by yourself. You are not always right, and someone is always going to be smarter than you." And it is something I'd heard before, but it's always been kind of sugarcoated. But yeah, it's those things right there. You can't do it by yourself. You're not always going to be right. Someone's always going to be smarter than you. Those three things I remind myself all of the time.

This understanding of human nature, strengths, and weaknesses has assisted Monica in her teaming activities, communication, and interactions with her engineering student peers. She is a stronger teammate because of the lessons she learned from her military mentor.

The participants believed that another valuable trait that characterizes many military members is their ability to lead, knowing when they should follow, and a strong belief in carrying their own

weight. Jon explained,

I guess as far as having previous leadership roles and stuff like that, I can tell when a group is just disorganized; [when] someone needs to step up and I guess that it's helpful. So, if someone does need to step up, I'll step up and [say] hey we need to get this f*cking done and get the ball rolling. And so, I guess it helps with that aspect. Also, no one ever wants to be the weak link in the group, right? So, if there is something that I'm definitely way behind on the power curve I'll try to speed it up on my end. Trying to f*cking stay up on the weekends so I can learn about the concepts so that following week we can all be on the same page.

The military forged Jon into a leader and he has used that skill in his engineering teams. However, he also stated that he understands times when it is not appropriate for him to lead. Jon's self-awareness and his perceived importance of "being on the same page" as his teammates makes him a valuable member of any engineering team. A more comprehensive list of skills the participants reported learning in the military include technical competence, teamwork, problem solving, professionalism, communication, and decision-making.

The participants also recognize and appreciate these teaming skills in other veterans. All of the participants reported a willingness or interest in working with their veteran peers in undergraduate engineering. Sean and Monica especially noted that they felt a kinship to the other veterans in the engineering program and would much rather work in a team of student veterans than the alternative. Monica mentioned that the veterans seem to gravitate to one another when they are seeking academic assistance.

Yeah, so most of the people that I'm studying with are veterans and it sounds like a weird gravitational thing. We all kind of had [an intuition], it was never an outright [statement of] they're veterans. Let's be friends. They're just like, "Oh hey, this is confusing to you too?" And it just kind of happened to be that they also are veterans.

Sean also described this kinship and trust among fellow veteran engineering students.

We all get along really well as far as I can tell. We all kind of have similar frustrations with people and stuff. So, in my class, we had to form groups and my group was four out of five veterans, [which] made things easy. We all did our work, we knew that it would get done, no one was like "Hey, I'm not going to do this," and I wasn't worried about carrying my weight. So that made things a lot easier, especially for that class because it was rough.

The access to student veteran peers seems to be a helpful strategy in navigating the academic and social challenges of this engineering program. They appear to be like-minded in work ethic and relatable through military experiences. The challenge then is to connect these student veterans with one another, so they can further their relationships of support.

Discussion

Interpretation of the Themes

The focus of this study was to better understand the unique strengths utilized and challenges encountered as veterans with service-connected disabilities transition from military service into an undergraduate engineering program. The demographics and military experiences of the student veterans that participated in this study vary widely, but there are many similarities when it comes to the barriers they have faced since entering academia. Jon, Monica, and Sean have all mentioned unique challenges associated with their service-connected disabilities, varying degrees of social disconnection from their student peers, and the loss of support and structure that was heavily present during their enlisted military time. However, they also exhibited unique skills that have aided them in their transition and brought added value to their teaming experiences in their engineering program.

The emergent themes all mapped back to the theoretical framework of the Schlossberg Transition Theory [19]. Unique challenges due to service-connected disability affected the *Self*, social disconnection from loss of social support worsened the *Situation*, *Social Support* represented within the need for more local access to support, unique skills learned in the military as a *Strategy*, and veteran peers in engineering as an additional transitional *Strategy*. All of the themes mapped back to the theoretical framework, but, for some, there was not a clear foundation in only one of the 4-Ss. As the 4-Ss may influence and be influenced by one another, there were emergent themes that aligned well with more than one aspect within the transition framework.

There were a few themes that overlap within the constructs of *Self* and *Situation*, which seems appropriate being that themes related to one's image of *Self* may create and contribute to further conflict within the transitional *Situation*. Like all the students, Jon reported losing the social support that he experienced during his military time. With that loss and without another adequate support system in place during his time as a student he had to rely on his skills and lessons learned in the military to be able to succeed in his coursework and teaming environments as the content became more difficult. However, this led to late nights working on assignments and a decrease in time that could be used to socialize and build social support structures. Jon even stated that his days were on a cycle that he referred to as "rinse and repeat" where all he did was attend classes, exercise, and work on his assignments by himself. He also reported feelings of insecurity and shame regarding his high level of service-connected disability and a need to hide it. This reinforces findings of unique challenges and the social stigma of people with disabilities [4], [7]. For him, his daily cycle of hard work and his feelings about his disability and how it would be perceived by others created a social disconnect between him and his peers in engineering. I venture to say that the loss of social support and his perceptions of his disability created a unique challenge for Jon, which, in turn, exacerbated the lack of social connection. The categories of transition, defined in this study as *Self*, *Situation*, *Support*, and *Strategy* are not solitary concepts, but instead they link together to convey a more dynamic narrative of these students' transitions and their coping mechanisms for their unique challenges.

In conclusion, the student veterans in this study faced unique challenges, but they were also armed with a unique set of skills with which they could overcome barriers and bring unique value to their engineering work. While the themes that emerged from the data could be viewed in many ways, I think the most dynamic and accurate message is conveyed by addressing both the struggles and the assets that student veterans experience in their undergraduate programs. With this lens, we are best able to discuss implications and make recommendations related to their support.

Implications

In the prior literature, we found a lack of empirical data surrounding military experiences as they impact transition into engineering and the role that service-connected disability may play in this transition. The current study provides an account of student veterans' experiences from the military, the effect of these experiences on their transition into college, and the hardships they associate with being a veteran with service-connected disabilities in undergraduate engineering. Throughout this investigation challenges that the participants faced, and continue to face, both in and out of the classroom as student veterans with disabilities were identified. However, opportunities to facilitate persistence and success over disabilities and other difficulties were discovered by examining some of the assets of the participants.

This study builds on the findings of prior work that identified a connection between military experiences and their effects on the transition to becoming an engineering student. Whereas previous research could not conclusively connect academic success to veteran identity, [3], [6], [25], the empirical data presented in this study regarding the role of student veterans' military experiences as strategies for their transition into college enables further development of strategies to build on student veterans' identified strengths when striving to mitigate barriers to academic and social successes.

The data also indicates a mismatch between the resources available to student veterans and their needs. While the participants interviewed had developed their own strategies for success by building on skills acquired during military service, this mismatch can lead to feelings of isolation and loss of value among student veterans. The participants were asked for their recommendations regarding changes they felt should be made to facilitate an easier transition for future student veterans. They recommended increased support for campuses that did not have their own veterans center, social orientation activities where student veterans can build relationships, more age-appropriate social activities for non-traditional students, and generally more veteran center involvement on their campus. For example, universities with multiple campuses may have a veteran outreach program on one campus, but not others, limiting veterans' ability to access those services. In seeking to attract, support and retain student veterans, it is not enough to merely offer veteran services. The services must also be effective, and student veterans must be able to easily access those services.

Limitations and Future Work

The primary limitations of this study are the sample size and the lack of multiple interviews. The sample was comprised of three students, so while it did exhibit variability across participants and

I believe their stories were appropriately documented, there may be a wealth of knowledge that could be gleaned from a larger sample. Also, the three participants did have very different jobs while they were enlisted in the military, but it would be interesting to further increase the diversity of military experiences by involving participants with other military jobs and higher ranks to determine whether the types of jobs and/or highest rank achieved have exceptionally different effects on their transition out of the military.

In an attempt to mitigate these limitations and answer questions that emerged throughout this study, I plan to continue this study and expand it in a number of ways. The sample will be increased to include more participants with different military backgrounds and ranks as well as student veterans on other campuses. Other topics of future work reflect more specific interests borne out of the data from this study. Further investigation comparing student veterans with combat experience and student veterans without combat experience may reveal dramatic differences due to the “life and death” nature of combat. Another area for exploration is differentiating characteristics of social interactions of student veterans with one another from their interactions with other college students. Finally, additional research should examine potential mechanisms to better support veterans with service-connected disabilities as they pursue degrees, as well as possible improvements to military programs intended to prepare servicemembers for civilian life.

Conclusion

Transitions of any kind can be challenging. They are times of change and often the people involved are not as prepared as they initially believed themselves to be. For student veterans, inherent transitional challenges can be exacerbated due to the stark differences between the pre-transition and post-transition situations, in terms of support systems, challenges to be faced, and, in the cases of this study’s participants, the existence of service-connected disability. While their past experiences may create unique challenges for the future, they also arm these students with unique skills and strengths with which they can overcome these challenges. Identifying these unique assets affords us a better chance to understand these student veterans with disabilities’ transitions and facilitate change to utilize successful strategies and better support for future student veterans with disabilities and disabled students who are not veterans.

Acknowledgments

We wish to thank students within the Engineering Education Systems & Design PhD program at ASU who provided feedback on our coding process, Noa Bruhis and Ieshya Anderson for their perspective and advice, and the reviewers of this manuscript for their support and thoughtful suggestions.

References

- [1] T. Church, "Returning Veterans on Campus with War Related Injuries and the Long Road Back Home," *J. Postsecond. Educ. Disabil.*, vol. 22, no. 1, pp. 43–52, 2009.
- [2] L. Zinger and A. Cohen, "Classroom : How Can Colleges Be Better," *Contemp. Issues Educ. Res.*, vol. 3, no. 1, pp. 39–52, 2010.
- [3] L. McBain, Y. Kim, B. Cook, and K. Snead, "From Soldier to Student II: Assessing Campus Programs for Veterans and Service Members," 2012.
- [4] A. Shackelford, "Documenting the Needs of Student Veterans with Disabilities : Intersection Roadblocks , Solutions , and Legal Realities," *J. Postsecond. Educ. Disabil.*, vol. 22, no. 1, pp. 36–42, 2009.
- [5] EngineerJobs.com, "Where the Engineering Jobs Are : July 2015," *Engineering Jobs Magazine*, Jul-2015.
- [6] J. Main, M. Camacho, C. Mobley, C. Brawner, and S. Lord, "Using focus groups to understand military veteran students' pathways in engineering education," *ASEE Annu. Conf. Expo.*, pp. 1–9, 2016.
- [7] F. Ostovary and J. Dapprich, "Challenges and opportunities of Operation Enduring Freedom/Operation Iraqi Freedom veterans with disabilities transitioning into learning and workplace environments," *New Dir. Adult Contin. Educ.*, vol. 132, pp. 63–73, 2011.
- [8] D. Accamando, "Determining the Specific Transition Needs of Military and Veteran Students (MVS), A Qualitative / Mixed Methods Study," Duquesne University, 2017.
- [9] R. Ackerman, D. Diramio, and R. Garza Mitchell, "Transitions: Combat Veterans as College Students," *New Dir. Student Serv.*, no. 126, pp. 5–14, 2009.
- [10] S. Burnett and J. Segoria, "Collaboration for Military Transition Students from Combat to College: It Takes a Community," *Journal Postsecond. Educ. Disabil.*, vol. 22, no. 1, pp. 53–58, 2009.
- [11] M. Sheppard, N. Kellam, and S. Brunhaver, "Soldier to Student: Exploring the Unique Skills and Challenges Veterans with Disabilities Bring to College," in *Frontiers In Education*, 2018.
- [12] M. Jakupcak, J. Cook, Z. Imel, A. Fontana, R. Rosenheck, and M. McFall, "Posttraumatic stress disorder as a risk factor for suicidal ideation in Iraq and Afghanistan War veterans," *J. Trauma. Stress*, vol. 22, no. 4, pp. 303–306, Jul. 2009.
- [13] C. Branker, "Deserving design: The new generation of student veterans," *J. Postsecond. Educ. Disabil.*, vol. 22, no. 1, pp. 59–67, 2009.
- [14] S. Tavernise, "As Fewer Americans Serve , Growing Gap Is Found Between Civilians and Military," *The New York Times*, 2011.
- [15] C. Knutson, "8 Reasons A Veteran Engineer Needs To Be Your Next Hire," *engineering.com*, 2015. .
- [16] J. Main, C. Brawner, S. Lord, C. Mobley, and M. Camacho, "Exploring Military Veteran Students' Pathways in Engineering Education," in *ASEE Annual Conference & Exposition*, 2015.
- [17] S. Ryan, A. Carlstrom, K. Hughey, and B. Harris, "From Boots to Books: Applying Schlossberg's Model to Transitioning American Veterans," *NACADA J.*, vol. 31, no. 1, pp. 55–63, 2011.
- [18] N. K. Schlossberg, "A Model for Analyzing Human Adaptation to Transition," *Couns. Psychol.*, vol. 9, no. 2, pp. 2–18, 1981.

- [19] M. Faller and R. Burnham, "Veterans transition to student life at ASU," 2015. .
- [20] J. Gonzalez, "ASU remains at military education forefront with another gold rating," *ASU Now: Access, Excellence, Impact*, 11-Apr-2018. [Online]. Available: <https://asunow.asu.edu/20180411-asu-news-military-friendly-school-ranking-victory-media>.
- [21] U.S. News and World Rankings, "How Does ASU Rank Among America's Best Colleges?," 2018. .
- [22] J. Creswell, *30 essential skills for the qualitative researcher*. Thousand Oaks, CA: SAGE Publications, Inc., 2016.
- [23] J. Saldaña, *The coding manual for qualitative researchers*. Los Angeles, CA: SAGE Publications, Inc., 2016.
- [24] A. Peshkin, "In Search of Subjectivity--One 's Own," *Educ. Res.*, vol. 17, no. 7, pp. 17–21, 1988.
- [25] W. Livingston, P. Havice, T. Cawthon, and D. Fleming, "Coming Home: Student Veterans' Articulation of College Re-enrollment," *J. Stud. Aff. Res. Pract.*, vol. 48, no. 3, pp. 315–331, Jul. 2011.

Appendix A: Interview Protocol

I'm interested in hearing your story of how you got to where you are today. Feel free to go back as far as you like. What are the experiences that helped steer you to where you are as an engineering student? Consider the full spectrum of experiences; these could be from childhood, family interactions, interactions with friends, work experiences... Along with this larger story I'm interested in how your military experiences played a role in getting you to this point.

Engineering Experiences

- So, what is being in school like? (Add relatable aspects of my memories)
- How has your time in the engineering program been going?
- Now, we all have ups and downs. Think back to a time or incident when you felt very supported. (Pull for descriptive feedback)
- Now, how about a time when you experienced the opposite?

Military Experiences

- What was your time in the military like?
- Where were you stationed?
- How long at each station?
- How did you feel about your time stationed at__?
 - o Probe to compare and contrasting different duty stations
- Did you deploy outside the United States?
 - o Probe is yes
- Now, we all have ups and downs. Think back to a time or incident when you felt very supported. (Pull for descriptive feedback)
- Now, how about a time when you experienced the opposite?
- Why did you decide to leave the military?

Transitional Experiences

- How would you describe this transition from the military lifestyle to that of student life?
- Did you go through SEPS and TAPS?
- In what ways did SEPS and TAPS prepare you for civilian life and school?
- Did you go through any of the other programs that are intended to help prepare you to go to school after the military?
 - o Probe if yes. How was that course helpful in entering academia?
 - o Probe if no. In what ways did you prepare to go to school after leaving the military?
- How much time passed between leaving the military and entering your academic program?
 - o Probe both short and long durations.
- What other experiences or training from your time in the military that significantly impacted your transition into this program?
- How about struggles? Positive and negative?

Comparisons to Peers

- What similarities have you noticed between your military time and your time in this program so far? What differences?
- “You’re a veteran...other people are not” How has your training or military service time affected your relationships and interactions with the other students? For example, have you noticed any similarities or differences between yourself, other veteran students, and the non-veteran students?

Final Questions

- How has your service-connected disability affected your engineering experiences?
- Do you have any recommendations to assist with future student transition?
- Is there anything else that might be relevant to our conversation today asked about?