



Article

Transitions of Student Military Veterans into Engineering Education

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Abstract: As student veterans transition to four-year institutions from the military, they navigate pathways that are often neither linear nor easy. Using Turner's theory of liminality, we examine student veterans' perspectives of the transition from military to civilian life. Interviewees include 60 student veterans from all military branches from four universities in the USA. Student veterans describe successes and challenges as they matriculate into engineering education as transfer students. Analyses of qualitative data yield original findings about the importance of mentors and student veteran networks for fostering student veterans' educational interests and in promoting their persistence. This study uses a framework of liminality to highlight the bridge between prior military position and a forthcoming reentry into society with a new professional identity as an engineer. In describing their studies, student veterans greatly valued military-learned skills, such as patience, discipline, and technical skills, that give them an advantage in their engineering studies. These findings will be relevant to researchers studying transitions in general and researchers investigating veterans or other populations experiencing transitions. University leaders, including student affairs administrators, faculty members, and others who serve the student veteran community will also benefit from the results.



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1. Introduction

In February 2020, a bipartisan bill, Supporting Veterans in Science, Technology, Engineering, and Mathematics (STEM) Careers Act, seeking to improve representation of veterans and military spouses in STEM fields, was passed into law (S.153 2020). The new law signals the growing national concern with the paucity of data on student veterans' transitions from the military into higher education. Tracking the quantitative outcomes of student veterans in higher education is a daunting task, in part because of the variation of methods used to collect such data. The National Veteran Education Success Tracker (NVEST) has published findings suggesting positive academic success for veterans using the Post-9/11 GI Bill to help fund their transition to a civilian career (Cate et al. 2017). This research suggests federal investments have resulted in positive outcomes, though the authors note more work on academic outcomes for student veterans is needed. Graduation success rates for student veterans vary tremendously based on institution type, and although data show strong success rates for veterans at some institutions, other institutions exhibit low investments in instruction and poor graduation rates for student veterans (United States Congress Senate Committee on Health, Education, Labor, and Pensions 2014; Veterans Education Success 2019). For student veterans, several factors (including priority

registration, connection to peers and faculty, dedicated veterans' services, new student veteran orientation, and student veteran organizations on campus) positively affect their outcomes (Ericson 2011; Mayorga 2018). Less is known about how student veterans actually experience the transition from the military to higher education. Our study focuses on student veterans attending non-profit, public and private four-year universities to qualitatively understand how these students experience their transitions at nationally-ranked universities.

This paper is part of a larger study on student veterans in engineering majors (Brawner et al. 2021; Lord et al. 2016, 2018, 2019, 2020; Main et al. 2019; Mobley et al. 2019b; Mobley et al. 2019a). This study was motivated by the national need for more graduates in STEM majors, and the potential for veterans to contribute to US workforce needs given their unique experiences with technical duties in the military. The research sought to answer the following research questions: (1) What are the strategies used by student veterans as they enter into four-year universities from the military and navigate through academia? (2) What experiences do student veterans rely on during transition to become a part of their new social contexts? Our research contributes to understanding how student veterans navigate the challenges of adjusting to the college experience. In this paper, we examine how mentors influence the persistence of student veterans. Veterans also attribute their success to the skills honed during their time in the military. This research highlights the agency of student veterans in their higher education pursuits and advances understanding of transitions using Turner's model of liminality. The findings will be relevant to social science researchers studying other populations experiencing transitions, education researchers studying veterans, as well as university leaders, including student affairs administrators, faculty members, and student veteran professional networks who serve the student veteran community.

2. Background

Student veterans often describe themselves as highly adaptable leaders (Main et al. 2019). Although their former military lives were highly structured in an environment of rigid discipline and rituals, student veterans who persist in higher education have learned strategies that help them navigate their university experiences, which generally may not offer as much structure. Veterans are not a homogeneous group. Thus, their transitions into higher education vary based on factors including educational experiences, sometimes called, "college knowledge," as well as their ability to balance external obligations and responsibilities. In addition, most student veterans are older than traditional college-aged students, and this may affect the breadth of their peer networks (Brawner et al. 2017). Other unique qualities specific to student veterans are their leadership skills, maturity, and self-efficacy—all assets that enhance the learning environments of their peers (Brawner et al. 2021; Lord et al. 2016; Main et al. 2015; Rabb et al. 2017). Finally, some student veterans describe challenges with psychological issues such as Post-Traumatic Stress Disorder (PTSD) and service- or combat-related disabilities (Elliott et al. 2011).

Drawing from their military experiences, student veterans attribute new meaning to their college experiences. While in the military, student veterans followed an organizational structure and top-down commands (Danelo 2014). In college, some student veterans apply a discursive military mindset, describing how they find meaning in being engaged in a "mission" to complete a four-year degree (Brawner et al. 2019). Notwithstanding, the college experience differs greatly from rules, norms, and patterns of military culture. Similar to the transition out of the military into civilian life, in a college setting, student veterans must adapt and learn to succeed in the absence of a highly regimented format of daily life (Lechuga et al. 2021). The academic environment requires that student veterans engage with a relatively fluid set of guidelines marked by diverse faculty expectations and abundant choices. This set of curricular responsibilities must be balanced with student veterans' additional commitments, extra-curricular work, and often familial obligations (ACE 2018).

In the post-9/11 context, new educational funding sources such as the “Forever GI Bill” have been made available to veterans since 2017 (Forever GI Bill 2017) and college programming has grown to meet the needs of the growing population of student veterans on college campuses. The time is ripe for more research on how student veterans adapt within this contemporary context. However, there is a paucity of research on this topic. Pellegrino and Hoggan (2015) suggest a need for more empirical research on student veteran transitions through the community college pipeline. Camacho and Atwood (2007) conducted a review of all articles published in *Armed Forces and Society* between 1974 and 2006 (32 years) and found no articles relating specifically to veterans and pathways to higher education.

Researchers agree that transition involves a process of change, and that people have varied reactions and responses during times of adaptation as they move through life; these changes are rarely seamless for veterans (Williams et al. 2018). Although studies indicate that for some student veterans transitions from the military environment to higher education create stress and anxiety (Alschuler and Yarab 2018; Elliott et al. 2011; Rumann and Hamrick 2009; Williams et al. 2018), Borus (1975) suggested that military life itself is marked by numerous transitions and that service members learn to cope with change successfully as a result. Borus’s original conclusions suggest that these experiences of repetitive transition may actually enable military veterans to more easily adjust to a new non-military transition in a university setting. Similarly, Cooper et al. (2018) examine how the cultural legacy of military life impacts transitions of military veterans into civilian life, and assert that veterans encounter numerous cultural transitions when moving between environments. Their experiences carry a legacy of discipline, which is imbued throughout the military structure and within an organizational socialization that highlights particular military values, such as rigor, self-discipline, and timeliness. Within the military’s structure, the practices of assimilating to the internal culture require that one learn patience, deference to authority, and an understanding that the command places “mission” as the highest priority (Brawner et al. 2019). Through this intense socialization, each military member is trained to forgo one’s own agency in the compressed context of basic training. Given this process of socializing of military members, how do those who transition to become student veterans learn to adapt to their new social locations within higher education? Williams et al. (2018) argue that what is at stake is “is the reconstruction of a valued self-identity” for former military personnel adjusting to civilian life (p. 813). Building upon prior research, Kirchner et al. (2014) assert that the “challenge of this transition [from military to college] may become the most significant barrier student veterans face and impacts the quality of education received” (p. 13).

Both the military and institutions of higher education are increasing efforts to improve the transition from the military to civilian life. The military itself has sought to strengthen transition programs for departing troops (Ismay 2016). Stakeholders have begun to offer strategies for universities to support student veterans in various academic settings, in both two-year and four-year contexts (Summerlot et al. 2009; Kirchner 2015; Jones 2017) and the American Council on Education (ACE 2018) has developed a “toolkit” for “veteran friendly institutions.” The marketplace has also evolved to help with the transition. For example, Veteran Transition Publishing (<http://collegetransitionpublishing.com/veteran-transition-publishing/>) (accessed on 11 June 2021)) offers customizable resources for purchase by colleges and written for veterans to help navigate the transition from the military to college. Purdue’s Military Family Research Institute produced tip sheets for veterans considering college, considering engineering, and for faculty and administrators interested in supporting student veterans (<https://www.mfri.purdue.edu/resources-and-research/resources/>) (accessed on 11 June 2021)). Clearly, there is broad interest at a national level to understand the unique needs of student veterans in higher education settings.

According to Ryan et al. (2011), one of the most important factors for easing the transition from the military to and through college is having an advisor who understands the unique needs of this population. The ACE offers guidelines for creating successful

programs and enhancing academic support. These core elements include: top-down administrative support to ensure the sustainability of student veteran support; offering student veterans a specific space with a central contact person; establishment of a student veteran organization; staff/faculty orientation (such as the Military Ally program <https://www.sandiego.edu/military/resources/military-ally.php> (accessed on 11 June 2021)), among others (ACE 2018, p. 5).

Communicating with student veterans poses unique challenges for university leaders because unless they disclose their veteran identities, student veterans do not necessarily display salient markers of this identity role (DiRamio and Jarvis 2011). Recently, the “Common App” for college admissions has added an indicator for veteran status as have many individual institutions, allowing veterans to disclose their status if they wish. This allows institutions to proactively offer services. Student veterans, however, are not a monolithic group and exhibit varied responses to the environments of higher education. For example, a lack of a direct reporting structure, or the absence of a highly structured team environment may impede clear means of communication. Some methods of communication may be more effective in reaching student veterans during their academic transitions (Kirchner 2015). In the context of higher education transitions, the ACE toolkit suggests,

While most student veterans are tech-savvy, word of mouth continues to be the way most will successfully receive and process information. While on active duty, service members do not typically need to check email or text messages to manage their schedules. They are told where to be and when—and they are expected to remember that information. It may take student veterans some time to adjust to a culture where so much information is conveyed without the spoken word (2018, p. 8).

Not all student veterans will readily identify themselves as military veterans. For example, those who have not been in combat may be less likely to identify as a veteran. Per the ACE,

Asking, ‘Have you ever served in the United States Armed Forces?’ rather than, ‘Are you a veteran?’ may have a large impact on the number and accuracy of responses (2018, pp. 7–8).

Veterans may also express their needs non-verbally, by inhabiting the classroom space in unique ways (such as needing to sit in the back, or near the exit). Pellegrino and Hoggan (2015) found that student veterans face financial strains and lack of familiarity with college structure. This is particularly true for first-generation college students (Mobley et al. 2019a).

3. Liminality as a Framework for Transitions

Our research uses a framework of liminality to theorize and develop understandings of how student veterans navigate their transition into and through higher education. The earliest studies of transition as a rite of passage dates back to the work of van Gennepe (1909), who theorized rites of passage as consisting of three phases: a separation phase, a liminal phase, and reintegration phase. Building on this work, Victor Turner and coauthors elaborated the concept of liminality, describing it as a limbo-like status of one who is betwixt and between an entry and an exit point (Turner 1967; Turner et al. 2017). According to Turner, a liminal state exists as an ambiguous time of transition between the time when one severs a connection with a previous social status and the time when one reenters into a new social position.

Recent doctoral dissertations have begun to apply Turner’s model of liminality to examine transition experiences of military veterans (Blair 2020; Sullivan 2017; Turnbull 2020). Applied to student veterans, the liminal phase is the time after one separates from prior military life and enters into a rite of passage phase as an undergraduate student, prior to entering the professional workforce with a bachelor’s degree in engineering.

As researchers have noted, transitions are never static; they occur over time and typically produce an anticipated outcome. Recently, scholars have begun to theorize the

generative processes of student transitions through higher education ([Heading and Loughlin 2018](#); [Rantatalo and Lindberg 2018](#)). For all students in higher education, the university experience is a limited period of time that produces encounters where individuals' identities actively evolve. The transition for student veterans, who tend to be older and most often enter a four year institution with some college credit units, produces many conflicting responses as they navigate their college experiences, drawing on their experiences with military life. With regard to college students, the liminal status represents the temporal passage between prior military position and a forthcoming re-entry into society with a new professional identity as an engineer (cf. [Rodriguez et al. 2018](#)).

Student veterans' experiences are informed by the mission-oriented mentality of military life. Military veterans have already gone through one rite of passage from civilian to active-duty military life. The new transition into higher education offers an opportunity to understand how student veterans carry their military experiences with them as they navigate change in a new and different context. For those who persist, the transition represents an opportunity for social mobility and reintegration into society with a new social status. Using a qualitative approach to foreground student veterans' lived experiences in the stage of liminality, we can begin to understand the stages of reflection where "the reformulation of old elements in new patterns" occurs ([Turner 1967](#), p. 99).

4. Methods

Our study of the experiences of undergraduate student veterans pursuing a bachelor's degree in engineering was conducted at four institutions across the USA using a convenience sample to represent geographic variation. These institutions were selected because of characteristics that included proximity to military bases, university support services for veterans, and campus mission. The Institutional Review Board at each institution approved our study; the 90 min interviews were conducted between Fall 2016 and Spring 2017. We conducted 60 qualitative in-depth interviews across our study institutions. Student veterans majoring in engineering were recruited by student veterans' organizations and key veteran support personnel on each campus and were provided with monetary incentives for participating in interviews. Each interviewee received \$50 for participating. The interview was preceded by an invitation e-mail requesting that volunteers complete a qualification survey that included information about demographics, military service, educational history and availability for an interview. Our interview protocol included questions about motivations for joining the military and for choosing the engineering major, the transition from the military to higher education, and current engineering education experiences.

Our positionality as researchers approaching this project is diverse, both in terms of our disciplinary backgrounds and racial/ethnic identities. We are a research team of women faculty members and a research consultant in the fields of engineering, sociology, and engineering education. While our study focuses on student veterans, none of the members of our research team identify as military veterans, although some of us are military-affiliated. Our collective expertise centralizes on researching diversity in engineering, as well as student pathways into engineering. Given that none of the members of our research team served in the military, and we are all women while our interviewees were predominantly men, we carefully developed methods that allowed us to bridge the possible trust gap between the student veterans and ourselves ([Mobley et al. 2019b](#)). Additionally, for this project, the research team was advised by an external advisory board consisting of a retired U.S. Marine Corps General, a retired U.S. Marine Corps Colonel, two formerly enlisted student veterans in engineering, and two White women faculty who regularly conduct research about veteran students.

4.1. Sample

The sample included veterans from the following military branches: Navy (21), Marine Corps (18), National Guard (10), Air Force (6), Army (4), and Coast Guard (1). The

interviewees ranged in age from less than 20 to over 35 years old, with the average age of those reporting a specific age being 27 years. Among all the interviewees, when asked about gender and race/ethnicity, 40 identified as White men, seven as Black men, four as White women, two as Asian men, and two as Asian women. One male participant reported “more than one race”, while one male participant specified race as “other” and one female and two male participants did not specify race.

4.2. Analysis Process

Interviews were recorded, transcribed, checked for accuracy and coded for themes using interrater reliability methods. Data were analyzed using ATLAS.ti software. In the quotations from participants throughout this paper, we removed filler such as “um”, “you know” “like” from the transcriptions for readability. Our general approach for this study is an inductive, thematic analysis. After the interviews were transcribed and verified, we engaged in a process of writing narrative summaries, called episode profiles (Maietta 2006) for each interviewee. The episode profiles include demographic information about each interviewee, salient topics and patterns that emerged during each interview, and key quotes related to transitions of military veterans into college. We selected quotes to highlight key points related to our research questions. Given the inductive approach, as we analyzed patterns in the data, we adapted a theory of liminality to explain those patterns.

Veterans are often reluctant to talk about their military experiences, particularly to non-veterans (Julian 2017). This paper draws on these in-depth interviews of student veterans to answer our overarching research questions related to student veterans’ decisions to pursue a degree in engineering, their experiences in the military and higher education, and institutional support for veterans in engineering. Our interview guide was crafted in consultation with our External Advisory Board (EAB). From our EAB, we learned, for example, the correct nomenclature for student veterans. In the case of military veterans enrolling in four-year institutions, their transitions to the role of “student veterans” results in their identities as “students,” discursively, as a prefix to their veteran identities. The national Student Veteran Association (SVA) established this phrase intentionally, following the National Collegiate Athletics Association (NCAA) phrasing of “student athletes,” which positions the student identity first. In this paper, “student veterans” refers to those who self-identify as military veterans, most of whom are no longer on active military duty (though some continue to remain engaged through the National Guard or Reserves), and excludes ROTC students.

4.3. Limitations

There are several limitations to our study. We only interviewed student veterans who identified as veterans and were still in college and thus were successful. As such, negative experiences that led to students stopping or dropping out were not represented in our sample and are therefore not included in our analysis. More research is needed on the diversity of reasons that play into why student veterans drop out of a university pathway. This is especially the case given that structural factors, such as the sources of federal funding that student veterans bring with them (through the Forever-GI Bill, for example), are unique to this population. We focused only on the theoretical framing of liminality which captures important elements of the variability of their experiences and provides insights into their strategies for success, but does not account for all aspects of the student veteran’s experience as students. Although we interviewed all women and people of color who volunteered, a stratified sample to include women and people of color would have enhanced this study and allowed for intersectional analyses. Similarly, we strived to achieve representation from all branches of the military, but we had many more volunteers who had served in the Navy and Marine Corps than the other branches. Given that respondents in our study are all engineering majors, which is a highly masculinized space in academia, their demographics parallel the predominately male space of the military; the implications of the gendered nature of military veterans’ transitions into

engineering are unexamined in this paper. Our research took place at four institutions; a broader sample of institutions could possibly uncover additional assets associated with student veterans' transition experiences. As our study was primarily qualitative in nature, relying on in-depth interviews, future studies could employ a mixed-methods approach, perhaps providing an opportunity for student veterans to share their experiences through a broad-scale survey.

5. Findings: Military Experience and Veterans' Support Networks for College Success

Our findings highlight the importance of experience gained in the military and student veterans' support systems. As they adapt to their new identities as engineers (cf. [Rodriguez et al. 2018](#)), student veterans often credited skills learned in the military, such as technical skills, discipline, patience, motivation, and learning from failure with helping them successfully transition to college. Student veterans also emphasized the importance of familial support, faculty mentors, and student veteran networks in fostering their educational interests and promoting their persistence. For example, some married student veterans described how their spouses helped them during times of ambiguity in their transitions to engineering education. Some student veterans successfully identified faculty mentors while others struggled to navigate sources of support within the institution. Formal and informal networks of veterans were most important for many student veterans' as they develop into future engineers. Following our interpretation of the data presented below, we inductively apply the theory of liminality in the discussion.

5.1. Role of Military Experiences in Veteran Students' Transitions

5.1.1. Technical Skills Learned in the Military

For some students, the technical skills and mindsets learned in the military shaped their transition, at times facilitating the experience and other times producing unique challenges. As one participant said, "I just have the troubleshooting background so that helps me see things from a different perspective". One student veteran shares a narrative about how his military training eased his transition to college as an engineering major:

Well, the type of unit I'm in, without goin' into all the detail, it's a Sigma unit. They deal with a lot of technical equipment, and computer equipment, electronic equipment. There's exactly a parallel relationship between my civilian education goals and my military training . . . I think they all are just like a combination in a nutshell. It's like a soup. They all play a major impact in my desire to go back to school and earn my engineering degree. The economy, the technical advancements, my desire to work in that field and enjoying working in engineering, solving problems, troubleshooting, working in a team, it all places a significant role.

In this case, he sees his educational goals and his military training as a "parallel relationship", in alignment with his student status. He explains that the common problems and workstyle approach in engineering is "just like a combination in a nutshell" of his military experiences which include "solving problems" and "working in a team."

5.1.2. Patience

Student veterans describe the challenge of being patient with their younger classmates. Paradoxically, while the student veteran shares the engineering experience with traditional students, they often have vastly different life experiences. One participant described how he needed to shed his propensity to give orders, stemming from his military training, in order to adapt to the student experience with his peers.

One thing I've really tried to do, especially since I've got [to University X] was I had to make myself detach from telling people what to do . . . or expecting more from students, kids, civilians, whatever, and just understanding that they're not Marines, they're not my age, they're younger . . .

Another participant cautions against dismissing these younger peers and instead finding ways to encourage them and even help them benefit from the veteran's perspective:

They'll complain about stuff and I'm just like, "Oh, it could be so much worse". but I try to not just be like, "Oh, you just need to . . . suck it up" . . . Try to encourage them, not just be hard on them or something like that because that's not the kind of person I want to be. But try to like, "Hey, it gets better, school's worth it." I have guys all the time it's like, "Man, I'm thinking about quitting school and joining the military." And I'm like, "Don't do it!"

In describing patience learned, one student veteran shared how this characteristic, learned while in the military, was particularly valuable in adapting to challenges in engineering education: " . . . patience and practice . . . [are] two key quotes to have when doing Calculus or Physics . . . cause it doesn't come naturally for anybody." He then goes on to describe the effort required to learn Calculus, where it is not unusual to:

. . . spend like 15 or 20 h a week on your own studying for it. And, you know, that takes a lot of understanding that it doesn't come easy but if you just put in a whole lot of practice and time . . . and even though it's frustrating that whole time you're doing it, if you have that patience it'll actually pay off.

He goes on to discuss how he learned patience in the military through sharing close quarters with others and how it would have been difficult to get by without developing patience with his comrades. As this student veteran attests, patience learned in the military, even in the context of sharing living quarters, transfers to the skill of patience required when learning a new academic subject. For some student veterans, patience is analogous to persistence.

5.1.3. Motivation and Persistence

As student veterans move through their time in college, they increasingly disassociate from the salience of their military identity, all the while retaining the military values as they shape their identities as future engineers. In the interviews, they framed their motivation to persist in light of their military values. As one student veteran reflected:

The Marine Corps three primary traits are, "honor, courage, and commitment". Commitment: honestly sticking with something no matter how hard it is, or the opposition's against you . . . Education doesn't pay off until you're finished, and I was a kind of a short-sighted person; I could see the grand scheme but getting myself motivated to stick with it . . . Doing school work every night, that's also a struggle. It's like, "Oh, I'm tired, I don't want to do it." It doesn't matter. Find a way. Motivate yourself. And, then working within my own study habits and think of the way I need to do it, and developing a plan.

In thinking about the intensity of an academic engineering workload, this student emphasizes the individual struggle to find motivation, in the absence of a military context where a mission is shared by a unit and imposed by the chain of command. His learned skills and commitment shape how he motivates himself to persist and endure. He recognizes that the value of commitment, required in the military, can lead to academic success when applied to studying and organizational habits. In response to the question "Are there any aspects of being a college student that are similar to being in the military for you?" one student responded, "I would say responsibility, doing the right thing. You have a responsibility to do your homework and show up to class. It's similar to the Army.") Many student veterans described their transition to higher education as part of their next "mission." Another student veteran similarly related,

Marines don't accept defeat, you know we don't . . . we don't give up, we don't surrender, we keep attacking no matter what happens. We adapt and overcome. And, in that sense there is a lot that the Marine Corps did do for me.

Another student veteran described the important role of the military in enhancing his motivation for succeeding in college and how that is different for him at this stage of his life, compared with the time right after high school.

I would've liked to come to college straight out of high school, but I don't think I would've done so well; only because I was super-lazy in high school. [Now] I don't have to worry about my parents getting mad at me for getting bad grades or anything like that . . . there's more motivation to get it done just because you're tired of being in school. we're here to do the work, to get our grades, and to get our degrees; not necessarily to have fun . . . our goals aren't to get the college experience, it's to get an education.

Another student veteran echoed these sentiments:

I'm here for this purpose you know, to get this degree, or to make this contact, or to do research here, get my grad degree. I'm not necessarily here to be involved with your club or your socializing with other students. I'm still trying to kind of find the balance between the family and school with the new kid and everything.

5.1.4. Respect and Discipline

Because of the military requirement to respect rank, many student veterans internalized the value of being respectful of their instructors.

[Professors are] clearly in charge of the classroom . . . they're typically the first person you want to talk to . . . in the Army if I had a problem, I could go to [my sergeants] . . . I show [professors] a bit more respect . . . I'll use their title and their name, so it's like, "Hey Dr . . . ", or "Yes, sir/Yes, ma'am," things like that where some of the kids just kind of blurt it out.

One student veteran believed that this respectful attitude was beneficial in dealing with professors. "When I approach professors . . . responsibly and respectfully and they're a lot more lenient and it helps me as an engineering student." He was frustrated by younger peers who were not as respectful:

I cannot stand . . . the way they communicate. They're disrespectful to some of the professors, they use a lot of slang. I heard someone earlier today and I wanted to correct them but I didn't.

One respondent shared that the practice of attending class requires him to adopt an active listening approach, and his military training has prepared him to be responsive "every time." He elaborates further:

In the Marine Corps they also teach you if somebody says something, you respond, every time . . . If the instructor says something, I'm like, "Oh, I've got to say something back," when they're asking questions . . . I don't know why kids don't respond . . . In the Marine Corps they also teach you if somebody says something, you respond. Every time.

Although military personnel learn to practice high levels of discipline, paradoxically, another student veteran shared that these skills do not necessarily prepare a military veteran to be an effective student:

Learning how to learn was probably the biggest [challenge]. [For example] one was what is my method and how do I stay organized? Like I have a good idea how to organize an event or how to run a shop of people doing a specific task, but how to run myself and . . . how to organize and keep a good train of thought on what's going on, and keep the knowledge that I've already gone over was something new . . . Trying to pool all of that together, but at the same time balance the transition out of the military for my family and . . . figuring out how to spend time with them.

As illustrated in this quote, learning and applying study habits is not a skill that comes naturally. Separation from institutions of education for any length of time requires refreshing on skills needed to succeed academically. Students who did not receive preparation in academic organizational skills earlier in their educational journeys may be at a disadvantage as they struggle to achieve work and family life balance. Many student veterans shared this perspective; some in greater detail explaining that they needed to acquire skills on the spot, while other students came to class fluent in software (such as Microsoft Excel).

5.1.5. Learning from Failure, with Age Comes Experience

Age was mentioned multiple times by student veterans. Because student veterans are older than traditional, first-time-in-college students, this is a salient characteristic that often differentiates them. In the previous section, note that the student veterans often referred to their classmates as “kids,” reflecting the age disparity. One student veteran quipped, “I did a [campus] tour, and I was that lonely old man in the back, talking to all the parents while their seniors, and juniors, and sophomores in high school were talking to each other.” Another shared, “I feel like I can’t relate sometimes, and it’s a generation gap, you make comments about *Star Trek* and they don’t understand.”

Many student veterans identified their age relative to their instructors as an advantage academically. As one shared, “I’m more close to the age range of my professors, so I’m not staring at an intimidating figure to go ask for help.” Another student veteran explained “my age gives me more of a responsibility in the sense that I am sure that when I would be out partying with friends if I was younger, I am not. And, therefore, that time is available to be spent working and on out-of-work on school assignments.” Another student veteran shared that his age put him “in a better position in some ways to succeed, [but] not in all ways.” His being older led him to decide to also pursue his graduate degree right after undergraduate so he could “kind of catch up a little bit” as he elaborates:

I’ve been a student straight out of high school, and I’ve been a student after, you know, five years in the Army. But the differences that I notice, just looking at myself I would say that now I have the advantage in certain areas to succeed just because I know how to do things the wrong way; I’ve spent a good amount of time in a job that has very little room for failure, unforgiving at times. I remember when I was young and single, my first semester at college you probably couldn’t imagine taking on those responsibilities but once . . . you’re married, and once you have a kid come along, I may not know how it’s going to work but it’s got to work, so you’ve got to figure it out. So I guess just those, you know, the life experience, the time in my military, the fact that I know how to do things the wrong way cause I used to do them the wrong way.

The student describes himself as resilient and goal driven and attributes his growth-mindset ([Dweck 2008](#)) to his age and his experiences in failure and learning from “doing things the wrong way.” This quality, of learning from failure, is integral to most academic majors. Learning to fail goes hand in hand with academic persistence ([Camacho and Lord 2013](#)).

5.2. Role of Support Networks in Veteran Students’ Transitions

5.2.1. Familial Support in Transitioning to College

Veterans discussed the importance of support from their families in their transition to college. This support included family legacies of being successful in the military and/or engineering. When they are able to, student veterans rely on family support (parental or spousal) to provide reassurance as they navigate the college experience.

Familial support was noted as a support pillar throughout college. For example, one student currently serving in the Army National Guard was required to report for his episodic service on the same day as his university orientation. He relied upon the help from

his parents to communicate with professors. He recognized that not all student veterans have parental support:

That's what my parents had to do for me. They had to communicate with my professors and tell them that, hey, I was gonna be late. They had to communicate with the university. It was a lot of work on their behalf. A lot of veterans, they don't have family that would do that for them.

Another student veteran shared that in the absence of parental support, he relies on spousal encouragement. He goes on to say that "some of the questions I have that my parents really can't answer; my wife can answer them a little better every once in a while." His wife gives him academic advice. However, she may not be an expert in academic advising. Having familial support does not negate the need for faculty mentorship.

5.2.2. Institutional Resources: Faculty Mentorship (or Lack Thereof) and Support Services

In the military one receives guidance through a formal chain of command; in the university setting, a student must seek out individuals for advice and mentoring. One student explains how he successfully found a mentor and learned to benefit from faculty advising. He describes finding a mentor and "draw[ing] on the relationships that [he] builds with people." He describes his authentic relationships as follows:

I did have a mentor here, or somebody I looked to as a mentor at least in the math part, he's helped me out as a tutor. It's developing friendships and then helping each other out in any way we can. And finding people that [have] been exceedingly helpful on the math and other things.

He goes on further to describe a professor, who has a "soft spot" and who is willing to spend extra time tutoring him in math:

[The professor] kind of gives me a different way [to think about it]. I can tell him what I'm thinking and he can [say], 'Well, maybe not. Let's draw it back to this', and he can give me something to compare it to. And that helps out a lot.

Here, the student veteran explains how a faculty member, showing personal interest, is powerfully effective in reaching the student who is struggling. This support may not be different for other non-veterans, but the student veteran clearly sees this as a special advantage. This suggests that the student veteran may not understand that no additional charge applies to faculty advising as a resource.

Another student veteran laments that finding faculty support in college was not as easy as finding mentors in the military. In the military, he had a mentor assigned to him who helped him adjust to military culture. In college, however, he noted that mentorship is not structured in the same way, and that it is incumbent upon the student veteran to seek out a faculty mentor. He indicated that in the military, "you have a mentor from the start, somebody's going to pick you up, take you under their wing and show you the way." He did not find that same support once he left the military. Rather in the civilian world, he said that "you've kind of got to seek them out and then they kind of seek you out from time-to-time but that's not always the case." Another shared that:

I've had maybe a couple of conversations with instructors. I don't really go to office hours. It's just not something I've ever really done . . . It took a while for my advisors to even connect the dots of who I was and everything. I don't even think, outside of my advisors, anyone really in the faculty of industrial engineering even knows [that I am a veteran].

This participant was disappointed in professors' lack of understanding of his situation as a veteran and found teaching assistants (TAs) more helpful:

The professor office hours have been mostly unhelpful because I feel that . . . they assume that the things that I'm struggling with are the same things that everyone else is struggling with and so they already have an answer on the queue before I

can adequately describe for them what I'm struggling with . . . The TAs, however, have been more helpful because like they're still students like me.

This participant also admitted that he might have trouble approaching professors because it feels like "admitting defeat." He shared that asking for help is:

. . . hard for me to admit sometimes . . . I'm embarrassed to ask for it because in the Army I didn't . . . if I did needed help I could either figure it out or I can just ask somebody and it wasn't a big deal . . . [In college], I feel like I should be able to handle it. Going to the professor is almost like admitting defeat, and you know, [I'm] a bit stubborn.

This suggests the importance of faculty and other instructional staff providing opportunities for students to ask questions and to listen carefully to the questions recognizing the unique experiences that students, including veterans, might bring.

Sometimes, institutional resources beyond academic staff play key roles in their transitions to college. For this participant, and some others in our study, the counseling center on campus played this role:

I have high regard for the counseling center cause they take you by a case-by-case basis unlike how I feel about the professors having the answer already before you ask it . . . they listen and then they provide guidance without forcing you down a certain path . . . they've given me like the appropriate tools to handle my situation.

When asked whether these tools were personal and behavioral tools or academic tools like study skills, this student was adamant that the counseling center had helped with "personal and behavioral tools, because I feel like I have the academic skills, right?" emphasizing that he had excelled in community college. Thus, it is important to note that it is not just academic support that some veterans need to successfully transition to college.

Student veterans often have complex paperwork requirements to activate their military educational benefits. A student veteran highly valued the Veteran Success Center and the staff's assistance with the GI bill:

The Veterans Success Center is really great. The location and everything that's in there is really nice, especially the people that work there. I've never had any issue with my GI bill . . . You fill out the paperwork, you give it to 'em, and it's taken care of. The accounts get settled. I've talked to other people where that's impossible. They said they have lots of issues getting all of their stuff done.

5.2.3. Peer Support through Student Veteran Networks

Coming from a military culture of public service, student veterans are often eager to offer service as mentors to their student veteran peers. The Seaman to Admiral (STA-21) program is a Navy program for highly qualified enlisted personnel to study engineering, among other disciplines, on an accelerated program while attached to the college's Navy Reserve Officer Training Corps (NROTC) unit as officer candidates (OCs). One STA-21 candidate that we interviewed was particularly mindful of the need for mentorship for those who follow, due to the difficulties experienced by her cohort of OCs. She started a mentorship program wherein she's "the point of contact from when they get picked up for STA-21 and decide they want to come here on." In that mentoring role, she provides a checklist to help them meet deadlines, establish a degree plan, and meet with their departmental advisors. Her leadership in developing the mentorship program and making it easier on future officer candidates indicates her understanding of the scope of the problem because transitions into higher education can be complex.

Similarly, student veterans discuss the importance of navigating the terrain of higher education with the support of the Student Veteran Association, a student organization that is increasingly present on university and college campuses. Notice, in the quote below, that the student veteran identifies the heterogeneity among veterans, differentiating, for

example, combat veterans from those who were not in combat. Despite the variation, there is still a shared group status:

Having that veteran network here on campus helps a lot. Being able to communicate with other people who are seeking their own degrees helps out in figuring out, "well if I have a problem I can go to them," and (hand clap) "I'm dealing with issue, what did you do?" Yeah, [in the veterans' center] just talking with everybody . . . we'll end up having at least somewhat similar backgrounds. For whatever reason, I don't understand it fully myself, but usually it is easier for veterans to communicate with other veterans than it is with anybody else and I guess it's part of that shared background . . . It doesn't really matter the branch. Now combat veterans is a little bit different story. They seem to be able to communicate better with other combat veterans. They can still communicate with other veterans. But if there's another combat veteran around, you'll see them tend to congregate together.

Here, the student veteran feels comfortable reaching out to the veteran network on campus, and suggests that their needs transcend military branch. He points out, however, that communication among combat veterans is unique, and that members of this subgroup seek each other out. He goes on to say that this relationship resembles a "family" type of structure:

Overall having that almost a support group is nice. When I was in the military we could ask each other, we were all family where we went cause your family is back home, wherever the heck you were from, particularly if you're overseas. I was in Korea for a year, it was remote deployment so that meant your spouse and kids couldn't come with you. You were there by yourself and the people you worked with became family. Your friends became more than just friends they were like your family, your support group, we supported each other . . . [W]here you have the organized student veterans, it's like having that support structure again.

This student veteran compares his military experience and the bonds formed in the military as akin to a remote "family." The role of his military coworkers served to offer a structure of support that is mimicked in the student veteran center. By contrast, another student veteran disagreed, saying:

I don't necessarily get along with a lot of types of personalities that the Marine Corps infantry will attract. There's a lot of great people that are in that community; there's a lot of very negative people in that community . . . It's actually kind of contradictory to what the Marine Corps teaches as far as how leadership is supposed to be. The methodology the Marine Corps teaches officially is more of a partner/mentor kind of thing; whereas, most of the leadership mentality that's demonstrated, at least at the smaller unit level, is more of the drill instructor screaming, yelling.

Although military veterans do not bring homogeneous experiences to college, once in college their shared experiences often contribute to a bond that transcends the particularities of their time in the military. Regardless of military branch, many veterans perceived that they learned critical skills and values in the military that can be successfully applied in their transitions to college, including technical skills, patience, self-discipline, motivation, and learning from failure.

6. Discussion

Turner's theory of liminality offers a useful paradigm of analysis to understand the temporal passageway through which military veterans exit the armed forces, enter university life, and exit with a bachelor's degree in engineering. Social supports help ground student veterans in the liminal space of transitioning into the college environment. While approaching faculty for mentorship, as for many students, is not readily embraced,

student veterans nonetheless find communal relief and create bonds with other student veterans. This is particularly the case when a shared space, such as a physical Student Veteran Center, is provided for them on campus. For those students who have immediate family members who can serve as a support system, the backdrop of this support provides another layer to their own motivation. Importantly, peer support, especially through organizations like the Student Veterans of America provide a collective opportunity that represents a bridge through the liminal time and space in which they are student veterans.

According to [Turner \(1967\)](#), the condition of a “liminal persona” is characterized by “ambiguity and paradox” (p. 97). Applied to student veterans, this involves a shedding of the “active” military status, and the adoption of a new set of identities. Arguably, all students undergo a liminal status during their time in college as they progress toward degree conferment and entry to the labor market. Student veterans transition from the rigidly ranked status of military members to the less-marked civilian status, and simultaneously inhabit the transitory progression of a new type of rank, that of student status (as First-Year, Sophomore, Junior, or Senior student, for example). Engineering student veterans differentiate themselves through the application of assets they bring to this transition to college, many of which are obtained in the military and are particularly useful for the engineering profession.

To enhance the student veteran experience, funds and human resources should be invested to provide support and structure for these student veterans’ success. For example, at campuses across the USA, programs such as the military allies program influence faculty perceptions of student veterans’ potential contributions, unique characteristics, and needs. While seeking out faculty mentors is a common practice in higher education, it is clear that some student veterans could use better guidance on the tacit rules at play within the Ivory Tower.

7. Conclusions and Implications

In the liminal space of a university context, student veterans adapt to ambiguity and paradox with skills learned in the military. Our research adds to the literature that uses an asset-based, rather than a deficit-based, approach to understanding the experiences of student veterans in higher education, specifically engineering education. This asset-based approach helps to illuminate the strengths that military veterans bring to academia as well as the positive elements of military service as a precursor to the college experience. The skills described by student veterans as most valuable in the university context include patience, persistence, respect for authority, self-discipline, and a range of technical skills specific to engineering education. Our main findings suggest that while transitioning into college may be challenging, student veterans approach difficult encounters using many of the lessons learned during their time of service. The socialization process incurred by the rigid military practices of their past becomes a source of resilience as they navigate their college transitions engaging with multiple support networks. Similarly, their experiences as members of a troop find common ground with on- and off-campus networks that offer structures of support. While some academic programs provide support for traditional students to transition from high schools to college, increasingly there are more opportunities for specialized programs to meet the needs of student veterans who are relatively older and have other experiences and responsibilities, in their transitions to college. Our findings highlight student veterans’ contributions to university life and the importance of supporting them through institutional programming. Creating resources and networks for student veterans in engineering and other STEM disciplines responds to the national call to broaden participation and increase diversity in higher education. Furthermore, leveraging investments in the education of those who have served our nation offers opportunities for them to enhance their social mobility. As the “Forever GI Bill” and other national legislation mandate, higher education can serve the increasing numbers of student veterans who hold great promise to contribute productively to our growing labor force needs.

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References

- Alschuler, Mari, and Jessica Yarab. 2018. Preventing Student Veteran Attrition: What More Can We Do? *Journal of College Student Retention: Research, Theory & Practice* 20: 47–66.
- American Council on Education (ACE). 2018. Toolkit for Veteran Friendly Institutions. Available online: <https://www.acenet.edu/news-room/Pages/Toolkit-for-Veteran-Friendly-Institutions.aspx> (accessed on 11 June 2021).
- Blair, Brantley B. 2020. Separate from Everybody Else: Interpreting the Lived Experiences of Post-9/11 Veterans at a Senior Military College. Ph.D. dissertation, School of Education, Northeastern University, Boston, MA, USA.
- Borus, Jonathan F. 1975. The Reentry Transition of the Vietnam Veteran. *Armed Forces & Society* 2: 97–114.
- Brawner, Catherine E., Michelle M. Camacho, Joyce B. Main, Catherine Mobley, and Susan M. Lord. 2017. Transitioning from Military Service to Engineering Education. Paper presented at the IEEE Global Conference on Engineering Education (EDUCON), Athens, Greece, April 25–28.
- Brawner, Catherine E., Susan M. Lord, Catherine Mobley, Joyce B. Main, and Michelle M. Camacho. 2019. How the ‘Needs of the Force’ Impact Navy and Marine Corps Veterans’ Decision to Major in Engineering. Paper presented at 2019 American Society for Engineering Education Annual Conference, Tampa, FL, USA, June 15–19. Available online: <https://peer.asee.org/32899> (accessed on 11 June 2021).
- Brawner, Catherine, Catherine Mobley, Susan M. Lord, and Joyce B. Main. 2021. Welcoming Student Veterans to Engineering: An Interactive Session for Faculty and Administrators. Paper presented at the 2020/2021 CoNECD—The Collaborative Network for Engineering and Computing Diversity Conference, Crystal City, VA, January.
- Camacho, Michelle. M., and Susan. M. Lord. 2013. *The Borderlands of Education: Latinas in Engineering*. Lanham: Lexington Books.
- Camacho, Paul R., and Paul L. Atwood. 2007. A Review of the Literature on Veterans Published in *Armed Forces & Society*, 1974–2006. *Armed Forces & Society* 33: 351–381.
- Cate, Chris A., Jared S. Lyon, James Schmeling, and Barrett Y. Bogue. 2017. National Veteran Education Success Tracker: A Report on the Academic Success of Student Veterans Using the Post-9/11 GI Bill. Available online: <https://www.luminafoundation.org/files/resources/veteran-success-tracker.pdf> (accessed on 11 June 2021).
- Cooper, Linda, Nick Caddick, Lauren Godier, Alex Cooper, and Matt Fossey. 2018. Transition from the Military into Civilian Life: An Exploration of Cultural Competence. *Armed Forces & Society* 44: 156–77. [CrossRef]
- Danelo, David J. 2014. *The Return: A Field Manual for Life after Combat*. New York: Black Irish Books.
- DiRamio, David, and Kathryn Jarvis. 2011. Veterans in higher education: When Johnny and Jane come marching to campus. *ASHE Higher Education Report* 37: 1–144.
- Dweck, Carol S. 2008. *Mindset: The New Psychology of Success*. New York: Random House Digital, Inc.
- Elliott, Marta, Carlene Gonzalez, and Barbara Larsen. 2011. U.S. Military Veterans Transition to College: Combat, PTSD, and Alienation on Campus. *Journal of Student Affairs Research and Practice* 48: 279–96. [CrossRef]
- Ericson, Katie. 2011. A Supplemental Orientation Program for Student Veterans. Master’s thesis, Department of Educational Studies, Ball State University, Muncie, Indiana.
- Forever GI Bill. 2017. Available online: <https://www.benefits.va.gov/gibill/forevergibill.asp> (accessed on 11 June 2021).

- Heading, David, and Eleanor Loughlin. 2018. Lonergan's Insight and Threshold Concepts: Students in the Liminal Space. *Teaching in Higher Education* 23: 657–67. [CrossRef]
- Ismay, John. 2016. Pentagon Strengthens Transition Program for Departing Troops. American Homefront Project. Available online: <http://americanhomefront.wunc.org/post/pentagon-strengthens-transition-program-departing-troops> (accessed on 11 June 2021).
- Jones, Kevin C. 2017. Understanding Transition Experiences of Combat Veterans Attending Community College. *Community College Journal of Research and Practice* 41: 107–23. [CrossRef]
- Julian, Amber. 2017. *Guided Autobiography Themes for Older Adult United States War Veterans*. Long Beach: California State University.
- Kirchner, Michael J. 2015. Supporting Student Veteran Transition to College and Academic Success. *Adult Learning* 26: 116–23. [CrossRef]
- Kirchner, Michael, Lia Coryell, and Susan Yelich Biniecki. 2014. Promising Practices for Engaging Student Veterans. *Quality Approaches in Higher Education* 5: 12–18.
- Lechuga, Vincente, Tearney Woodruff, Vassa Grichko, and Kevin Bazner. 2021. Adapting to College Life after Military Service: A Motivational Perspective. *Journal of College Orientation, Transition, and Retention* 28. [CrossRef]
- Lord, Susan, Catherine Brawner, Catherine Mobley, Joyce B. Main, and Michelle Camacho. 2016. Military Veteran Students' Pathways in Engineering Education (Year 2). Paper presented at the 2016 American Society for Engineering Education Annual Conference, New Orleans, LA, USA, June 26–29.
- Lord, Susan, Catherine Mobley, Joyce B. Main, Michelle M. Camacho, and Catherine Brawner. 2018. Military Veteran Students' Pathways in Engineering Education (Year 4). Paper presented at the 2018 American Society for Engineering Education Annual Conference, Salt Lake City, UT, USA, June 24–27.
- Lord, Susan M., Michelle M. Camacho, Catherine E. Brawner, Joyce B. Main, and Catherine Mobley. 2019. Military Veteran Students' Pathways in Engineering Education (Year 5). Paper presented at the 2019 American Society for Engineering Education Annual Conference, Tampa, FL, USA, June 15–19. Available online: <https://peer.asee.org/32466> (accessed on 11 June 2021).
- Lord, Susan M., Michelle M. Camacho, Catherine E. Brawner, Joyce B. Main, and Catherine Mobley. 2020. Military Veteran Students' Pathways in Engineering Education (Year 6). Paper presented at the 2020 American Society for Engineering Education Annual Conference, Tampa, FL, USA, June 22–26. Available online: <https://peer.asee.org/34973> (accessed on 11 June 2021).
- Maietta, Raymond C. 2006. State of the Art: Integrative Software with Qualitative Analysis. In *Improving Aging and Public Health Research: Qualitative and Mixed Methods*. Edited by L. Curry, R. Shield and T. Wetle. Washington, DC: American Public Health Association and the Gerontological Society of America, pp. 117–39.
- Main, Joyce B., Susan Lord, Michelle Camacho, Catherine Brawner, and Catherine Mobley. 2015. Military Veteran Students' Pathways in Engineering Education (Year 1: Award# 1428646). Paper presented at the 2015 American Society for Engineering Education Annual Conference, Seattle, WA, USA, June 14–17.
- Main, Joyce B., Michelle M. Camacho, Catherine Mobley, Catherine E. Brawner, Susan M. Lord, and Hilal Kesim. 2019. Technically and Tactically Proficient: How Military Leadership Training and Experiences Are Enacted in Engineering Education. *The International Journal of Engineering Education* 35: 446–57.
- Mayorga, Ernesto. 2018. An Ecological Approach to Exploring Veteran Academic Success. Master's thesis, Department of Social Work, California State University, Sacramento, CA, USA.
- Mobley, Catherine, Joyce B. Main, Catherine E. Brawner, Susan M. Lord, and Michelle Camacho. 2019a. Pride and Promise: The Enactment and Salience of Identity Among First-Generation Student Veterans in Engineering. *The International Journal of Engineering Education* 35: 35–49.
- Mobley, Catherine, Catherine E. Brawner, Susan M. Lord, Joyce B. Main, and Michelle M. Camacho. 2019b. Digging Deeper: Qualitative Research Methods for Eliciting Narratives and Counter-Narratives from Student Veterans. *International Journal of Qualitative Studies in Education* 32: 1210–28. [CrossRef]
- Pellegrino, Laura, and Chad Hoggan. 2015. A Tale of Two Transitions: Female Military Veterans during Their First Year at Community College. *Adult Learning* 26: 124–31. [CrossRef]
- Rabb, Robert J., Kevin C. Bower, Robert J. Barsanti, and Ronald W. Welch. 2017. Veteran Students in Engineering Leadership Roles. Paper presented at the 2017 American Society for Engineering Education Annual Conference, Columbus, OH, USA, June 25–28. Available online: <https://peer.asee.org/29104> (accessed on 11 June 2021).
- Rantatalo, Oscar, and Ola Lindberg. 2018. Liminal Practice and Reflection in Professional Education: Police Education and Medical Education. *Studies in Continuing Education* 40: 351–66. [CrossRef]
- Rodriguez, Sarah L., Charles Lu, and Morgan Bartlett. 2018. Engineering identity development: A review of the higher education literature. *International Journal of Education in Mathematics, Science and Technology* 6: 254–65. [CrossRef]
- Rumann, Corey B., and Florence A. Hamrick. 2009. Supporting Student Veterans in Transition. *New Directions for Student Services* 2009: 25–34. [CrossRef]
- Ryan, Shawn W., Aaron H. Carlstrom, Kenneth F. Hughey, and Brandon S. Harris. 2011. From Boots to Books: Applying Schlossberg's Model to Transitioning American Veterans. *NACADA Journal* 31: 55–63. [CrossRef]
- S.153. 2020. Supporting Veterans in STEM Careers Act. Available online: <https://eric.ed.gov/?q=source%3A%22US+Congress%22&id=ED605565> (accessed on 11 June 2021).

- Sullivan, Mary E. 2017. Role and Identity Adjustment and the Experience of Liminality in Veterans Seeking Higher Education: A Qualitative Investigation. Ph.D. dissertation, Department of Psychology, William James College, Williamstown, MA, USA.
- Summerlot, John, Sean-Michael Green, and Daniel Parker. 2009. Student Veterans Organizations. In *Creating a Veteran-Friendly campus: Strategies for Transition and Success*. Edited by R. Ackerman and D. DiRamio. San Francisco: Jossey-Bass, pp. 71–80.
- Turnbull, Shannon. 2020. Becoming a Marine, Becoming a Veteran: The Enculturation of the United States Marine Corps. Master's Thesis, Anthropology Department, Northern Arizona University, Flagstaff, Arizona, USA.
- Turner, Victor, Roger D. Abrahams, and Alfred Harris. 2017. *The Ritual Process: Structure and Anti-Structure*. Abindon-on-Thames: Routledge.
- Turner, Victor. 1967. *The Forest of Symbols: Aspects of Ndembu Ritual*. Ithaca: Cornell University Press.
- United States Congress Senate Committee on Health, Education, Labor, and Pensions. 2014. Is the New GI Bill Working?: For-Profit Colleges Increasing Veteran Enrollment and Federal Funds. Available online: <https://static1.squarespace.com/static/556718b2e4b02e470eb1b186/t/56100b87e4b0147725a71e86/1443892> (accessed on 11 June 2021).
- van Gennep, Arnold. 1909. *The Rites of Passage*. Chicago: The University of Chicago Press.
- Veterans Education Success. 2019. Should Colleges Spend the GI Bill on Veterans' Education or Late Night TV Ads? Available online: <https://drive.google.com/file/d/1USxgmt2o5tl3hZ5WOVaRnvzJTEDRKWfo/view> (accessed on 11 June 2021).
- Williams, Rachel, Jacquelyn Allen-Collinson, John Hockey, and Adam Evans. 2018. 'You're Just Chopped Off at the End': Retired Servicemen's Identity Work Struggles in the Military to Civilian Transition. *Sociological Research Online* 23: 812–29. [CrossRef]