Transition to the Civilian Workforce: Themes and Lessons from Military Service and Culture

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Transition to the Civilian Workforce: Themes and Lessons from Military Service and Culture

As part of a collaborative inquiry practice known as engaged scholarship, the Military Veterans Division convened a panel of military and veteran community stakeholders to comment on the challenges, lessons, and gifts that their military and military-adjacent experiences provided in their pursuit of higher education and careers in engineering. Moderated by a Director of Research and engineer who transitioned to engineering after a successful 20-year enlisted career in the U.S. Army, a diverse panel of five men and women to share their experiences. Our panel comprised a Department of Defense civilian and Army veteran, a Dean of Engineering and former Naval Academy professor, an engineering education faculty member and Navy enlisted veteran, an engineering graduate student and Navy enlisted veteran, and an early career civil transportation engineer and current enlisted Army National Guard Soldier.

The panelists' military experiences were diverse and varied, and each panelist challenged assumptions about the features and trajectory of their service and educational path. Gender and race were discussed, as panelists commented on the ways they felt their personal identities and opportunities for advancement were supported by their military or military-adjacent service. All panelists emphasized that the solution-focused mindset conferred by their service training enabled teams to work more effectively due to shared values and mission in a military context. In contrast, panelists described how civilian-based work and academia often surfaced within-group divisions in terms of shared goals. Panelists noted that their egalitarian posture toward teamwork was also supported by structural hiring changes made by the military in the last twenty years.

Absent or weak pathways to engineering for enlisted military personnel were also discussed. Student veterans and hiring managers emphasized that broadening engagement with national research labs that support DoD priorities is key to building feasible and accessible engineering pathways for student veterans. All panelists noted that, while the military experience is not monolithic, the intangible skillsets of leadership, project management, accountability, and solutions-focused mental posture are a natural fit for the engineering field—a match that student veterans can use to build a sense of 'belonging' as they transition.

1. Background - Student Veterans

Student veterans are older, post-traditional students who pursue higher education [1-2]. Ohland reports that economics plays a major role for non-traditional students, and especially for student veterans. It is the primary factor to return to school, where to attend, and what degree program to study [3]. Institution preference is often affected by proximity to current location and to family, cost and reputation. Student veterans are motivated by career opportunities, self-improvement and personal growth, the potential for improving their economic status, leveraging their earned benefits, and a desire to help people [4]. However, for the veteran transitioning from a military occupation and environment to an academic lifestyle and civilian career, the experience can be very different and challenging. Linking student veterans with resources they need is important to their success in the classroom and civilian careers. Their maturity and experiences hone their skills and determination, preparing them to be successful in the classroom. Each student veteran

has different challenges and requirements, and all need the information and resources to connect to the community and succeed in their educational and career goals [5].

1.1 Career Match

Veterans who experienced and used their technical training in the military are excellent matches to pursuing STEM degrees. Forty-three percent of student veterans report that their military specialization or training was STEM-related [4]. The Veteran Administration (VA) reports that veterans enroll in higher education to: increase career opportunities, develop new skills, apply military skills in civilian life, and to improve their quality of life [6]. Between 2019-2021, 330,000 veterans used their GI Bill to obtain a bachelor's degree. Over 130,000 of them sought a STEM degree, and 20,489 veterans were pursuing a degree in engineering, accounting for more than 15% in the STEM field and 6.2% overall [7]. Student veterans have a strong record of completing post-secondary degrees, often attributing skills and qualities strengthened by military service such as: work ethic and discipline, teamwork, leadership and management skills, mental toughness, and self-discipline [6]. However, student veterans who never attended college must learn to navigate an unfamiliar environment and its structure that focuses on the needs and interest of younger students. The cultural values developed by service members also include professional expectations: timeliness, discipline, accountability, and authenticity. These professional characteristics are highly sought by employers and instructors. Regardless of personal identity, race, religion, or political association, veterans largely seek each other due to their shared values that guide their professional attitude to work [8].

1.2 Barriers to Education

As post-traditional students, student veterans are typically older than their student peers in higher education [1-2]. Many student veterans have dependent family members and/or parental obligations; some may be employed; and some may have service-connected disabilities. Student veterans with families frequently need to balance their academic aspirations with their family and work commitments. These life realities often limit and/or tightly schedule their time available, causing some student veterans to choose to attend college part-time rather than full-time, or online instead of on campus. Student veterans may forgo high impact experiences like internships and undergraduate research opportunities, as college campus life is not designed for students who commute or have families and other interests away from campus [9]. Additionally, National Guard members and reservists may face breaks and disruptions in their educational journey due to unexpected activations (deployments and mobilizations). However, many student veterans 'stay the course' in their post-secondary academic ambitions and complete a degree [10].

One of the most noteworthy obstacles student veterans describe facing in their academic journey is the opinion among some that they would not be welcomed, supported, or valued in a civilian academic setting. While most veterans (84%) feel there is a place for veterans' leadership and success in higher education, many (53%) feel that post-secondary institutions do not recognize veteran-specific competencies and abilities within higher education [4]. The military experience includes mentoring and consistent, specific feedback; many veterans report the absence of mentoring or guidance regarding next steps to be one persistent challenge as they transition [11].

Student veterans report a variety of transitional difficulties, including adapting or re-adapting a civilian/veteran identity; the role of higher education; and a lack of services for student veterans [12]. The Veterans Administration reports student veterans have mixed perceptions of their preparation and readiness for traditional schoolwork and meeting academic standards. Military training and courses can be very duty-specific, while college courses are more abstract and cover more general knowledge. Research has identified five perceptions held by veterans that correlate with an unsatisfactory transition to civilian life: 1) feeling like they do not belong; 2) missing the military culture and structured lifestyle; 3) retaining negative views of the civilian lifestyle; 4) feeling left behind compared to civilian career opportunities; and 5) having difficulty finding meaning in the civilian world [13].

2. Motivation/Purpose statement

As the Military and Veterans Division (MVD) of the American Society of Engineering Education (ASEE) developed from a constituent committee to a division over the last 8 years, the MVD leadership has cultivated a growing community of veteran engineering education stakeholders interested in identifying and advancing solutions to issues affecting veteran engineering education and workforce development. Today, this community comprises a diverse set of stakeholders, including military veterans, current servicemembers, and civilians; researchers, practitioners (i.e., higher education instructors and administrators), and industry and government professionals (i.e., engineers); and education users and clients (i.e., students), and sponsors (i.e., government and industry engineering employers). As evidence of this growing community, a panel of these stakeholders, which included veterans currently in engineering roles and veteran studies scholars, was convened at the 2016 ASEE Annual Conference. This inaugural ASEE panel centered on challenges of and potential initiatives to support student veterans in STEM. Outcomes from the panel discussion were subsequently reported in a paper presented at the 2018 ASEE Annual Conference in Columbus, OH [14].

In 2022, the MVD leadership team planned, coordinated, and conducted a follow-on panel, comprised of veteran engineering education stakeholders and addressing the broad theme of veteran pathways to engineering careers. Presented at the 2023 ASEE Annual Conference, the purpose of the stakeholder panel, “Veteran Pathways to Engineering,” was multifold: to examine veterans’ engineering career pathways from viewpoints that may not be as well represented in the literature (i.e., veteran and current enlisted servicemembers and DoD and military-adjacent civilians), to identify military practices aimed at supporting diversity, equity, and inclusion that could be leveraged in other settings, and to build on the findings from the previous panel [14]. Following the completion of the 2023 panel session, members of MVD leadership and the panelists engaged in collaborative exploratory research to examine and coproduce theoretical and practical knowledge, and ideas for “next steps,” from the panel discussion. The results of these efforts are the focus of this paper.

3. Method

The methodological approach known as *engaged scholarship* [15-16] was employed to frame this study that is related to current issues within veteran engineering education and career pathways into engineering and engineering-related occupations. As Van de Ven [17] explains,

engaged scholarship is an approach for identifying, studying, proposing solutions for, and assessing improvements in "complex social problems that often exceed our limited capabilities [as researchers] to study on our own" (p.37). Originating from within the applied research domains of organizational theory and project management, engaged scholarship is "collaborative form of inquiry" [18] wherein researchers "are involved, collaborate, negotiate, develop trust and coproduce knowledge with members of the organizations over issues that are of concern to the organization" [19]. Use of engaged scholarship can be particularly useful for scholars working in professional domains, such as business, engineering, education, law, medicine, and others, as an approach for advancing scientific and practical knowledge —research and action— simultaneously [15].

3.1 Participants

In early 2023, MVD leadership team used convenience sampling [20] to identify and recruit panel participants from within our professional networks. Care was taken to ensure that a diverse group of stakeholders who represented the varied interests and viewpoints of the veteran engineering education community was asked to / agreed to participate. Specifically, we sought to include participants who represented diversity across the following characteristics: race, ethnicity, gender, and generation; military status (i.e., current service member, veteran, civilian) and rank, military service component (i.e., active duty, Reserves, National Guard, and current professional role). An MVD leadership team member with a military career as a senior enlisted U.S. Army soldier agreed to serve as the panel moderator. Together, the MVD leadership team generated a list of potential panelists from their networks. Once the leadership team agreed on potential participants to invite, individual team members contacted potential panelists with whom they had existing professional relationships or acquaintanceships. This process continued until five panelists agreed to contribute to the panel discussion, either in person while in attendance at the conference or virtually (as was the case for one panelist).

Table 1: Description of Panel Participants

Participant	**Race/ Ethnicity ***	**Gender**	**Age**	**Military Status**	**Military Rank and Service Component**	**Current Professional Role**
Moderator	White	M	40-50	Veteran	Senior Enlisted Army	Director of Engineering Research
1	White	M	50+	Veteran	Officer Army (Garrison Commander)	DoD** Civilian Chief of Talent Acquisition
2	Black	M	50+	Civilian	N/A Navy-affiliated***	Academic Dean of Engineering
3	White	M	35-45	Veteran	Enlisted Navy	Engineering Education Academic Faculty

4	White	M	25-35	Veteran	Enlisted Navy	Mechanical Engineering Graduate Student
5	Bi-racial/ Asian American	F	20-25	Current service member	Enlisted Army National Guard	Early Career Civil Engineer

* None of the panel participants identified as Hispanic or Latinx
** U.S. Department of Defense
*** Former faculty member at the U.S. Naval Academy

A summary of panel participants and their demographics is provided in Table 1. Race and ethnicity, gender, and age information were verified by each participant.

3.2 Data Generation

The MVD leadership team collaboratively developed questions for the panel. Panelists were provided the questions developed by the MVD team in advance of the panel. In addition, each panelist developed a PowerPoint "quad chart" slide to support them in introducing themselves to the audience. In all, five questions from the MVD team and one question from an audience member were posed to the panelists:

1. Please introduce yourself to the audience.
2. If you were military, how did your military service and/or military culture influence your career selection to become an engineer?
3. What differences in attitudes about diversity and equity, if any, did you notice between being in the military and working with military personnel, and being a veteran and working with civilians?
4. What can and should we be doing to help our military veterans find a pathway to engineering and serve as engineers for society? (audience member question)
5. What advice or lessons learned would you offer to someone who is transitioning from the military right now to higher education or the civilian workforce?
6. What impact, if any, has your transition from the military or military-related service to higher education or industry had on your significant other, spouse, or family?

The panel session was conducted as a MVD technical session at the 2023 Annual Conference. The moderator and four panelists participated in the panel discussion in person, while one panelist, who was not an attendee at the conference, participated via ZOOM video conferencing.

Audience interaction was encouraged, and audience questions served to enrich the panel members' responses. The panel discussion and audience member questions were audio (only) recorded via ZOOM; the panel members provided prior consent to having the discussion recorded and using the recording as data for research. Additionally, the Institutional Review Board of the first author's university confirmed that an IRB protocol was not required because the panel was conducted as a public event and the panelists had no expectation for privacy. The

panelists also agreed to co-authoring an ASEE conference panel paper based on the analysis of the panel discussion.

3.3 Data Preparation

Trint (www.trint.com), an artificial intelligence (AI) powered, cloud-based internet application, was used to generate an initial textual transcription of the panel discussion audio recording. Once the textual transcription was generated, two individuals collaboratively verified the transcript by listening to the audio recording and adding to or correcting the textual transcription as needed. The resultant (verified and corrected) transcript was downloaded from the Trint application and securely stored in a restricted access (research team only) folder on Box.com, an encrypted cloud-based storage system.

3.4 Data Analysis

A four-member qualitative research team, which regularly conducts research focused on student veterans in engineering and includes one member of the MVD leadership team, collaboratively analyzed the textual transcript using accepted practices for qualitative thematic analysis described by [21]. As a first step in the analytic process, each of the four researchers independently read and completed initial coding of the transcript. During the initial coding process, the researchers labeled blocks of text that stood out as important ideas, using descriptive or in vivo words or phrases as needed.

Next, the four researchers met as a group to discuss their label assignments. Together, the researchers read through the transcript and discussed the labels they assigned to each segment of text they considered meaningful. Labels were written down on a whiteboard, simplified and/or combined, and then transferred to a text document. Together the researchers identified 88 labels that each described one transcript excerpt.

Using a recursive and collaborative process, each of the four researchers took the list of labels and worked independently to group the labels together into categories. After these independent categorizations were complete, a single researcher synthesized the four categorizations into a single set of categorizations that best reflected the individual categorizations. Once the categorization synthesis was complete, the researchers met again as a group to review, verify, and modify the categorization synthesis and concurrently develop the labels into a refined list of 71 initial codes that described one or more excerpts and comprised the categories.

Once consensus was reached, the categories were given descriptive names to become subordinate themes, or sub-themes [21]. Table 2 presents the sub-themes derived from the refinement and categorization of the initial codes.

Table 2: Sub-themes derived from Initial Codes

A. Post-military paths to engineering education and careers vary
B. Common obstacles service members transitioning to engineering face
C. Emotional and cultural connections to military

D. Synergies between military service and engineering
E. Passed-down connections to the military and engineering
F. Tensions between military/engineering and academic mindsets and practices for diversity and inclusion
G. Adopting new practices to support diversity and inclusion in DoD hiring
H. Power of community for supporting inclusion of student veterans in engineering
I. How can student veterans navigate interpersonal relationships in engineering
J. Post-military familial identity changes and challenges
K. How to help exiting service members transition to an engineering career path
L. Taking personal responsibility in the transition

As a final step in the thematic analysis, the research team met on two more occasions to group and synthesize the descriptive sub-themes into interpretive themes [21]. In support of this process, two research team members individually took turns refining the groupings and the text for themes and then sharing the refinements with the other members of the team for feedback and consensus-making. This process continued until group consensus about the themes was reached. Table 3 presents the final themes derived from grouping and interpreting the sub-themes.

Table 3: Themes derived from Sub-theme Grouping and Interpretation

Themes	Sub-themes	
Theme 1. The engineering pathways of military veterans vary by individual, despite being affected by common obstacles.	A	Post-military paths to engineering education and careers vary
	B	Common obstacles service members transitioning to engineering face
Theme 2. Separating from the military has profound psychological effects on individual service members as well as military families.	C	Emotional and cultural connections to military family
	J	Post-military familial identity changes and challenges
Theme 3. There are multiple synergies, in terms of attitudes, skills, mindsets, and roles, that exist between military and engineering occupations.	D	Synergies between military service and engineering career
	E	Passed-down connections to the military and engineering are evident and similar
Theme 4. Changing responses to traditional meritocratic ideals are catalyzing new practices to support diversity and inclusion in the DoD civilian workforce and academia.	F	Tensions between military/engineering and academic mindsets about diversity and inclusion
	G	Adopting new practices to support diversity and inclusion in DoD hiring
Theme 5. Military service members in transition to engineering careers benefit from external (i.e., institutional, familial, community, mentor) and internal (i.e., self-help) supports.	H	Power of community for supporting inclusion of student veterans in engineering
	I	How can student veterans navigate interpersonal relationships in engineering
	K	How to help exiting service members transition to an engineering career path
	L	Taking personal responsibility in the transition

The resultant five themes represent the base of knowledge co-produced by the researchers, MVD leadership team, and the panel members as a result of the 2023 panel discussion. While the data for the thematic analysis was generated through, or by use of, the panel questions, the themes go beyond simply answering the discussion questions. Developed from a holistic interpretive analysis of the poly vocal discussion, rather than by segmenting the data based on the specific question that generated them, the themes respond to and yet transcend the limits of the panel discussion questions to the extent that the panel responses ventured beyond the discussion prompts.

4. Results

The five themes generated from the panel discussion data provide coproduced insights into servicemember transitions from the military into higher education and engineering careers. In the following sections, each theme is described.

4.1 Theme 1. *The engineering pathways of military veterans vary by individual, despite being affected by common obstacles.*

Panelists moved beyond simply listing the myriad barriers they faced in transition, and rather emphasized the uniqueness of the paths and processes they employed to make the transition despite facing common obstacles. Panelists described a variety of paths they followed to become engineers and emphasized how, despite being in a community, their experiences were "***not monolithic***." Their paths included using military service as a training ground to build practical skills and technical know-how *prior to* engineering education. Alternatively, another panelist described undertaking undergraduate engineering study first and then entering military service in an engineering-adjacent military specialty, serving *concurrently with* their undergraduate engineering education. Another panelist described how they considered college as their plan B, entering college only after they could not find the type of employment they sought after separating.

The obstacles the panelists did describe focused on experiences that impeded their forward momentum in their educational and career journeys: (a) the need to personally translate their military skills and to gain new academic credentials to be competitive in the job market, (b) inadequate transition counseling, preparation and opportunity to reflect and plan for their future before exiting, (c) an ableist, self-sufficient mindset, engendered in the military, that can interfere with requesting and receiving earned and needed separation benefits, and (d) interpersonal stress that comes from meshing with and adapting to teamwork with those with alternative mindsets. Importantly, the panelists framed the difficulties they faced *agentically*. Rather than hard stops, impenetrable barriers, or personal deficits, panelists described the difficulties they faced as obstacles they were forced to navigate— structures and processes they had to work with, around, and through to continue their journey.

The panelists also referred to the ways the decisions about staying in or exiting the military were mutable and often not fully realized or internalized when they entered the military. Thus, they noted how separation decisions can happen over a short time-period and without sufficient

forethought. Thus, the need for career exit counseling and reflection may be heightened. Finally, as one panelist noted, military separation is likely more streamlined for service members who separate as officers compared to those who separate as enlisted service members. Service members must have attained (at least) a bachelor's degree to become an officer; some officers may have attained more than one post-secondary degree by the time they leave the service. Thus, those who separate as officers may not have the same immediate requirements for education and training to gain civilian employment as those who separate as enlisted service members do. Additionally, since the undergraduate engineering degree path is known to be particularly intensive and time-consuming, those officers who have earned an undergraduate degree in engineering prior to separating have a distinct advantage to becoming a practicing engineer as a veteran. Importantly, the state of educational transition issues, particularly for enlisted service members, was directly described by an audience member as an "***equity issue***" that is in need of being addressed.

4.2 Theme 2. *Separating from the military has profound psychological effects on individual service members and military families.*

In describing their transition and engineering pathway experiences, several panelists described the deep emotional and cultural connections, built over their years of service, that they feel toward the military. One panelist likened being a part of the military to being a ***part of a family*** and described the emotional toil taken when one is no longer an active member of the Military Family. This participant also described how their military identity is "***part of [their] core,"*** and continues to be salient to this day, long after their military involvement has ended.

Other panelists described how their connections to the military instilled in them a desire to give back to the military and other military veterans after their service. This desire, in turn, directly affected what they did in their post-military civilian careers. One participant described "falling in love" with the U.S. Army and continuing to work to support it through their current job as Talent Acquisition Officer for the DoD. Another described how they focused their academic research agenda on student veterans, applying for and receiving five consecutive federal grants that directly support student veteran research experiences in engineering. In these ways, the panelists selected civilian options that could keep them — if not in—on the periphery of the Military Family community.

Alternatively, as adult, post-traditional learners [4], servicemembers share increased likelihood to have committed partners and families (i.e., dependents) with whom they have close personal and emotional ties and for whom they may be financially responsible. As the panelists described, being emotionally and financially tied to a servicemember is much like being in the military oneself. In other words, the panelists describe how civilian members of military families automatically become part of the larger "Military Family" to which all service members belong. One audience member shared how their spouse, also a veteran, described being in and out of the military as "***being in and out of a bubble***." Being in the bubble suggested that military families do things in certain ways, using military processes and infrastructures and accessing military family-based communities that share common values and are built specifically for them. Being out of the bubble happens when, for example, a military family transitions out of the military and there is no longer a military health care facility available to them. All of a sudden, the family

must enter and navigate the civilian and/or VA healthcare establishments. These and similar transitions to veteran and civilian service establishments and processes can be uninviting, time intensive, and onerous for members of military families.
Other panelists described transition out of the military as being a family affair. The familial nature of military separation and transition come partially as a result of the servicemember and the family members simultaneously undergoing complex changes in their identities and, resultantly, in their relationship dynamics. Panelists shared personal stories, describing how long-term relationships suddenly ended when military service ended, or how familial role and employment necessarily changed when the servicemember's income was no longer there. At its most basic, panelists suggested that military separation happens to military families, together. In transition, families must make sacrifices and work to build a new identity, as a civilian family, as they leave the Military Family "bubble."

4.3 Theme 3. *There are multiple synergies, in terms of attitudes, skills, mindsets, and roles, that exist between military and engineering occupations.*

As a group, the panelists provided several examples of the synergies that exist between military service and engineering work. Often, panelists described these synergies as "shared skills and mindsets," "building confidence," "being a leader," and taking a diverse group and "becoming a team," rather than distinctly named and earned competencies or credentials (e.g., helicopter pilot). One panelist aptly summarized military-engineering synergies as learned and shared military skills that "build in the same direction as engineering."

This same panelist described how they realized the engineering value of their military skills several years after being separated, while in school and working. They described the value of military skills for engineering emphasizing, "We were all problem solvers. We had to have come up with creative solutions. We work in teams. You don't always pick those teams. There's the ability to pivot and make changes." The panelist further described how their last assignment, as an enlisted Navy technician working with Marines within six-nine months of separation, provided them the spark to become an engineer. Working "as a crash test dummy" for an engineering group designing new warfighting technologies, the panelist recalled how "being at these roundtables with [those] engineers and [those] designers was the first time I realized that this experience was what I wanted. I wanted to be on the other side of the table."

A second panelist described how they specifically looked for synergies between service branch and civil construction engineering competencies prior to enlisting. Ultimately, they chose to enlist in the Army, since the Army conducts more construction engineering missions than the Air Force. Another panelist described how, showing up to the Navy, they preferred working as a mechanic and weren't "too confident in anything more technical." However, going through the process of "earning your dolphins," which required memorization of the purpose, power, location, and a diagram of every piece of equipment on the submarine, changed all that. The panelist recalled how working through the "daunting" process with the support of peers and superiors "helped prepare me well for engineering school coming out of the military."

Another synergy between military and engineering occupations occurred in the ways panelists described having connections to the military and engineering that they developed during their

youth or were passed down from their extended families. In one way, engineering and military interests seemed to develop from recurring experiences panelists had when they were young. One panelist, who was a Navy Sea Cadet in their youth, described "flirting with a career in the Navy since … high school." Another described how they remember always wanting to become a civil engineer because, being from Iowa, they grew up marveling at the I-74 bridge. Other connections were passed down from family. One panelist described being inspired both to serve in the military and to become an engineer because of the experiences of their father and grandfather. Both had served on active duty and both became engineers after they separated. Thus, youth-based and familial connections that are present and handed down within families appeared as an interesting, yet relatively unexplored, synergies between the motivations for pursuing both military service and engineering careers.

4.4 Theme 4. *Changing responses to traditional meritocratic ideals are catalyzing new practices to support diversity and inclusion in the DoD civilian workforce and academia.*

Overall, the panel described differences in and tensions between attitudes and mindsets related to diversity and inclusion that are prevalent across engineering, academia, and the military. Panelists agreed that military and engineering culture espouse more mission and team-focused mindsets, while academia embraces a more individualistic mindset. One panelist described the team mindset as "a mission driven sort of philosophy. Understanding that it's not individual, it's about the team concept and if one individual fails, then the whole team fails." The panelist went on to describe the more individualistic mindset of academia saying, "Joining [a university], it is a slightly different idea. You know, you've got to deal with personalities sometimes [that] don't have that mission centric concept and you just have to be persuasive in your arguments." The same panelist later described the team mindset saying, "even as a person, you may not agree with everything that team prescribes, but it is a team decision."

The discussion about differences in attitudes and mindsets related to diversity and inclusion in the military, engineering, and academia touched on personnel systems and hiring practices in the DoD civilian sector and academia. One participant described how, unlike the centralized hiring practices within the military, the DoD has historically relied on local hiring to fill its civilian engineering-related jobs. Over time, local hiring practices and veteran preference policies have led to, as this panelist explained, "a lot of the same kind of folks, same background, same thinking, sometimes same familial connections within the DoD." Over the past several years, there has been a push to change hiring practices to improve the diversity within the DoD civilian workforce. The panelist described how the key change has been to diversify hiring pools through better advertisements through social media and the use of special hiring authorities, such as returned peaceful volunteers. Since hiring DoD decisions are ultimately based on merit, the panelist remarked that the only way to achieve a more just and equitable DoD civilian workforce is to ensure hiring pools are filled with highly-skilled, diverse workers.

Offering an alternative opinion, another panelist who works in academia suggested that diverse hiring pools are necessary but not sufficient for diverse and equitable hiring in academia. Rather, diverse and equitable hiring in academia requires that hiring committees reflect the diverse types of people the organization wants to hire, and that there are allowances for contextuality and flexibility in decision-making about candidate requirements in relation to the goals of the hire,

particularly the goals for diversity of the hire. The panelist stated, “If we feel that we have a special initiative, that we have to meet some goals, we have some influence to say, look guys, let's go back and rethink these kinds of things.”

Last, discussion around diverse and equitable hiring practices led one participant to consider how the concepts of equity, equality and mission completion and efficiency apply to opportunities for military training. Using the words “***Efficient*** … ***doesn't always mean equal***,” the panelist described how, in their unit, the drive for efficiency— to get the mission done quickly —often leads to unequal and, ultimately, inequitable training circumstances. They described how, due to a focus on unit efficiency, the same few servicemembers, who are highly qualified and experienced heavy equipment operators, get the mission work and the training and skills building practice. The lesser experienced and lesser skilled workers are often not given the work since it will take longer for them to do. The loss of skills training could ultimately affect servicemembers’ skill qualifications and opportunities for advancement and promotion. Oftentimes, the most skilled operators are men (e.g., “farm boys”), and the lesser skilled operators are women. Ultimately, in this case, the drive for unit efficiency leads to lost opportunities for under skilled workers and an inequitable workplace that further reinforces gender inequality.

4.5 Theme 5. *Military service members in transition to engineering careers benefit from external (i.e., institutional, familial, community, mentorship) and internal (i.e., self-help) supports.*

The panelists agreed on the necessity of support across several broad areas to encourage separating service members to follow and progress along engineering career paths. Generally, panelist support recommendations were categorized as being *external* or *internal* to the servicemember. Panelists described external supports in terms of actions that can be taken by institutions, families, and communities to assist separating service members in three areas: transitioning to an engineering career path, navigating interpersonal relationships in engineering, and building a sense of belonging (i.e., feeling included) in engineering. To help separating service members transition to engineering career paths, panelists focused on the need to make engineering career paths more visible to enlisted servicemembers as they begin the process of separating from the military. Panelists agreed that military transitions services should focus more on getting enlisted service members to reflect on where they are and where they want to go before they separate. Additionally, since DoD engineering jobs offer viable employment for veterans, DoD and academic institutions should raise veteran and student veteran awareness of the availability of and requirements (i.e., security clearance) for DoD positions.

To help veterans move forward along engineering career paths, panelists offered ways that institutions and communities could help veterans navigate interpersonal relationships, particularly in engineering education and academia. One panelist emphasized the importance of veterans “…finding a mentor or two.” They explained that the purpose of having a transition mentor is to have “somebody that you can just count on to pull you aside if maybe you're getting a little too aggressive or your leadership style you [need] to adjust a bit. Or somebody that you can just go to and ask questions and speak with, someone that you trust to help with that transition because it is very real.” Having mentorship support would also help ingrain other

panelist recommendations for helping veterans navigate interpersonal relationships: understanding that and when it's important to take a step back and let someone else lead, especially in team environments; knowing that you have people who are "***in your corner"*** and making use of those connections; and knowing that it's okay to ask for help and having someone easily accessible to ask.

Panelists also emphasized the importance and power of community for supporting belonging and inclusion among student veterans in engineering and academia. As one panelist described, military and veteran students can feel left out at university for a variety of reasons, including age and interest differences. In addition, available student clubs and organizations might not suit veterans' schedules or desires for socializing. This panelist described their efforts to develop a Society of Student Veterans in Engineering that was successful in providing a place for student veterans in engineering to socialize and find community. More recently, it has further "become a way for military and nonmilitary students to come together for a period of time and learn from each other."

Last, panelists described available mindsets and attitudes that can be adopted by veterans as empowering internal supports to help themselves during their own transition. First, veterans must accept that the responsibility for transferring their military skills and experience to civilian employment is theirs. Despite a plethora of government and private resources aimed at supporting veterans in transition, veterans must take the initiative during their military separation. For example, panelists suggested that transitioning service members must be proactive to know and use available resources and opportunities. As a transitioning service member, it is also important and useful to take an inventory of personal strengths to build confidence and to become consciously aware of the areas in which further support may be needed. For veterans with families, it is important for veterans to understand that family members are in transition, too, and to act with respect and empathy toward familial circumstances and experiences in transition. Last, transitioning service members should realize that they, not others, are the ones in transition. Veterans should not expect others (i.e., civilians) to change to accommodate them. Rather, veterans should accept and actively participate in the process of change that is occurring within themselves, and give themselves the time, patience, and grace that is required to do so.

5. Discussion

The agentic nature of the discussion surrounding military transition and career challenges faced by veteran panelists stands out starkly against the backdrop of the student veteran support literature, which often frames the challenges that student veterans and other post-traditional students face using deficit framing [22]. In this discussion, the panelists were clear in their message that veterans can and should work against and around common institutional obstacles, know their resources, seek support, engage with veteran mentors, and get involved in veterans-focused groups on campus to build a sense of belonging there. The idea that student veterans, who comprise an underserved student population, must actively negotiate obstacles embedded within the educational terrain coincides with the conceptual model of student navigation proposed by Lee and colleagues [23], who conceptualized how "students from historically excluded demographic groups" must actively consider and make decisions about their path

through the undergraduate engineering learning environment as they traverse it. In this panel discussion, student veteran navigation of educational terrain was seen from agentic and assets-based perspectives to empower student veterans to actively work against higher education structures and processes that were not built for them [24]. The assets-based tenor of the conversation was also seen as a benefit of community engaged scholarship; when veterans were brought into research conversations, they provided practical insights on ways that veterans can help themselves and support other veterans in higher education.

6. Conclusions and Implications for Research and Practice

This panel surfaced unique, emergent research veins that merit future work: (1) demolishing monolithic interpretations of veterans' experience; (2) constructing multi-path strategies to engineering that map to rank, adjacent technical skills, and student goals; (3) rejecting deficit models of the student veteran experience; (4) investigating the link between military habits of mind and problem-solving strategies and their synergies with engineering and creativity; (5) understanding the veteran transition experience as one that impacts a family as much as an individual, and charting impacts for recruitment and retention within engineering education.

This paper is an introduction for how military personnel transition directly into engineering careers or through gaining engineering expertise as they transition. Themes that emerged from the 2023 Panel provide insight to employers, faculty, and administration. These short synopses of the themes show the span and complexity that many student veterans navigate in addition to their campus transition. Service members must connect to multiple resources to gather assistance for their transition and at different times. These themes hold significant value for those seeking to support student veterans. First, it will allow higher education institutions, employers, and other stakeholder communities to audit which support systems and policies meet the needs of these student veterans. Second, the consideration and suggestion may guide the next steps in practice and policy changes that support college attendance and degree attainment for student veterans.

The veteran transition represents an opportunity to expand the number of engineering graduates to meet the growing demand. Increasing awareness of the complexities for student veterans transitioning to engineering careers suggests further investigation.

The panel discussion also produced several insights for future research related to student veterans in engineering. Along with the currently known need for veterans studies scholars to report on gender, race, and ethnicity of student veterans to better understand their intersectional gendered and racialized experiences as they transition into higher education, findings from this study suggest there is also need to report on students veterans' military rank and service component when examining student veterans pathways in engineering. As the panelists discussed, veteran pathways to civilian engineering careers are not monolithic; rank (i.e., officer or enlisted) and its associated opportunities for earning post-secondary engineering degrees prior to or while in the military greatly affects student veteran opportunities and engineering pathways. Additionally, the panel discussion data highlights how part-time service in the Reserve or National Guard Component can be used as means to concurrently fund undergraduate engineering education *while it is in progress*. This potentially newer engineering pathway is currently underexplored in the research literature.

The familial nature of military separation is another underexplored area of student veteran experience with implications for engineering education. In light of the uniquely intensive and time-consuming nature of undergraduate engineering degree programs, engineering academic units and university veterans resource offices may want to consider how they can more effectively include and support engineering student veterans' families. Future research on military mindsets or habits of mind as synergies within engineering might be relevant and useful, as well as studies that seek to understand how authentic veterans' pathways stories, such as the ones hinted at in this panel discussion, can be documented and implemented to help service members reflect on the career interests and pathways before they separate.

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