2023 Annual Conference & Exposition
Baltimore Convention Center, MD | June 25 - 28, 2023
The Harbor of Engineering Education for 130 Years
ASEE
Paper ID #38656

WIP: Institutional Agents' Awareness and Perceptions of Military Students in Undergraduate Engineering Programs at Public Institutions in the Western United States

Hannah Wilkinson, Utah State University

Hannah Wilkinson is a graduate student in Engineering Education at Utah State University. She received a B.S. in Chemical Engineering in from the University of Utah.

Dr. Angela Minichiello P.E., Utah State University

Angela Minichiello is a US Army veteran, a registered professional mechanical engineer, and an associate professor in the Department of Engineering Education at Utah State University. Her research examines issues of access, equity, and identity in the professional formation of engineers and the development of a diverse engineering workforce.

WIP: Institutional Agents' Awareness and Perceptions of Military Students in Undergraduate Engineering Programs at Public Institutions in the Western United States

Military students, defined for the purposes of this study as students who are U.S. military veterans and/or current military service members, such as in the Reserves and National Guard, continue to be understudied and underserved in undergraduate engineering education. The research that does exist with this population is more often conducted at colleges and universities that are a) known for being military-friendly schools and/or b) located in military-friendly communities, often in close proximity to U.S. military installations, that offer substantial social support for veterans and servicemembers outside of school [1]. Little research exists that examines military student experiences in other contexts, such as 2- and 4- year public colleges and universities that may have limited supports (and support dollars) for military students, and/or are not located in or near military-friendly communities. Despite this dearth of research, there is both a need and desire to increase awareness and support for military students at these institutions.

Literature

Research with military students who are engaged in undergraduate engineering education is relatively new [1]. To date, much of this research has focused on and/or included participants who are Reserve Officer Training Corps (ROTC) and service academy cadets or military-affiliated students, such as military spouses and dependents [1]–[3]. While research conducted with these populations is undoubtedly important, cadets and military-affiliated students have different educational experiences than those who have served or are serving. Generally, existing research in engineering education has focused on questions of why military students choose the military and engineering as careers [4]–[7], how military student identities are negotiated during the transition between the military to school [4], [5], and the factors that influence military student success in higher engineering education [8], [9].

Existing research with military students in undergraduate engineering education has been more often conducted in military-friendly contexts, such as at colleges and universities that are a) well-known for being military-friendly schools and/or b) located in close proximity to a U.S. military installation [5], [6], [10]. However, there is literature that reminds us of the need to support military students who attend college across the nation, including in contexts which are not, necessarily, considered military-friendly [11]. These alternative settings include many public 2- and 4-year colleges and universities located in the western United States.

In addition to the need for conducting military student research in a variety of contexts, understanding the awareness and perceptions that institutional agents have about military students in engineering is critical for improving support for military students in this discipline. For the purposes of this study, institutional agents are considered to be higher-education personnel, such as faculty, staff and administrators, who work directly with students in some academic capacity [12]. While research with institutional agents in engineering education is limited, the literature that does exist suggests that institutional agents have a direct influence on the persistence and success of the engineering students they interact with [13].

Purpose/Research Questions

This study has two main goals: 1) to understand the awareness and perceptions that institutional agents (e.g., faculty, staff, administration, advisors, and resource officers) possess regarding military students in engineering at public institutions in the western United States, and 2) to synthesize promising practices used to support military students at these institutions. To meet these goals, this study is guided by the following research questions:

1. How do institutional agents describe their awareness of military students' presence and needs for support in engineering and how does this awareness relate to institutional agent background and role?
2. How do institutional agents describe their perceptions of the assets, capabilities, and identities that military students bring to engineering and how do these perceptions relate to institutional agent background and role?
3. What promising practices exist for supporting military students in engineering and how do institutional agents describe gaps, if any, in these practices?

Research Design

This study uses an emergent qualitative analysis approach that is based on grounded theory methodology [14]. As such, the research design pulls from aspects of grounded theory to ultimately identify and conceptually map the institutional agents' awareness of military students at their institution. This also allows for the synthesis of effective practices that can be used to improve support for military students. The research design is described below.

Participants. Participants for this study were recruited from the population of faculty, staff, and administrators listed on the websites of 2- and 4- year public institutions that offer undergraduate engineering or pre-engineering programs and are located in the western United States. Drawing from constructivist approaches to grounded theory [15], participants were recruited for this study using purposive sampling, a type of sampling wherein the researcher selects participants based on specific characteristics [16]. Participants were purposefully selected based on their job role working with military students at either the university (e.g., veteran support office, inclusion office, or similar) or working in student support roles in a college of engineering (e.g., engineering advisors or faculty). Once five initial participants were recruited and interviewed, snowball sampling [16] was introduced, in addition to website searches, to recruit additional participants to meet theoretical sampling needs. Participants' institutional roles and information about the institution are described in Table 1.

Table 1.
Participant and Institution Information

Participant	Background	Role	Institution Type	Military Friendly Recognition	Distance to Nearest Military Installation

Participant A	Engineer	College of Engineering-Administration	4-year public University Land grant	None	> 50 mi.
Participant B	Veteran	Veteran Support Office	4-year public University Land grant	None	> 50 mi.
Participant C	Veteran	Veteran Support Office	4-year public University Land grant	None	> 75 mi.
Participant D	Social Worker	Inclusion Center	4-year public University Land grant	Yes	> 50 mi.
Participant E	Veteran and National Guard Servicemember	Veteran Support Office	4-year public University Land grant	None (Supported by private donors)	> 25 mi.
Participant F	Veteran	Veteran Support Office	2-year community college	None	> 75 mi.

Data Generation. A semi-structured interview protocol was developed to guide the interviews. The IRB approved protocol was developed and face-validated using questions provided by authors of previous studies related to the interaction of institutional agents and military students [12], [13]. Questions included: "What are your perceptions about the level of awareness of military students in higher ed/engineering ed in your department/office?" and "What do you think needs to be done to increase inclusion and sense of belonging of military students in higher education?" Single, semi-structured interviews were conducted with each participant. These interviews lasted between 45-90 minutes and were conducted either in person or via ZOOM as required. All interviews were audio-recorded, transcribed via Trint web-based software [17], verified, and de-identified prior to analysis.

Data Analysis. Using constructivist grounded theory methods, data was analyzed using constant-comparative analytic (CCA) methods [18] as data were collected. To create consistency and ensure quality during this process, we used techniques described by Saldaña [19] to develop codes and generate themes from the data. These techniques included first-cycle coding, codebook development, second-cycle coding, and thematic analysis. The preliminary results from second-cycle coding for six participants' interviews are included in this paper.

Limitations. Recognizing that the work for this study is ongoing, we have made efforts to ensure the quality of the preliminary results presented in this paper. Data generated from all participant interviews conducted thus far has gone through first-cycle coding by at least two researchers. A codebook was created, with input from the principal investigator and an undergraduate research

assistant, based on the first cycle coding. Findings presented in this paper were drawn from the second-cycle coding of data generated with participants employed at five of the seven different institutions in the western United States represented in this study. During first-cycle coding, we recognized differences in the data generated with participants working at the institutional level as compared with participants working at the college level and, thus, recognize the need for further sampling of participants from engineering colleges. We plan to increase the number of participants who are institutional agents in engineering colleges prior to developing final results from this study.

Preliminary Findings

Preliminary findings from second-cycle coding of data generated with six participants employed at five of the seven institutions included in the ongoing study are presented in this paper. Participants' most common responses when probed about their perceptions of the assets/attributes military students bring with them to higher education, as well as current gaps and promising practices for military student support, are synthesized for each research question and presented below.

RQ1: Institutional agent awareness of military students' presence and needs for support.

For the purposes of this study, awareness was operationalized as the participants' demonstrated knowledge about the presence of military students in the engineering college or institution, or their belief whether others had this knowledge. Preliminary results suggest that participants' belief whether their engineering college or institution had an awareness about the presence of military students varied greatly. Some participants felt their institution had high levels awareness, while other participants felt their institution had none.

For example, Participant D, who works in an inclusion center at their university, described a networking event for military students in the mechanical engineering department that had taken place the day prior to the interview. Participant D said,

> "I think it was just to get together with. Like a networking event, and I know they're going to be faculty there. They just had it last night actually [sic] happened, but yeah, so it's just kind of come a meet and greet, I think [sic] build community among each other, meet some faculty."

To have a networking event for military students, the mechanical engineering department, if not the entire engineering college, must have awareness of the military student population in their program.

In contrast, Participant A, who works within an engineering college at a different university with comparatively less support for military students, demonstrated that they had very little awareness of the presence of military students within the college of engineering. Participant A said,

> "I mean, I'm assuming we have a [sic] we have a significant number of military students or otherwise you wouldn't be doing a study, right? But we don't know who they are. We don't know what support they need. I don't. Does the college know? Probably not**."**

Participants A's words revealed that not only did they have limited awareness of military students in engineering, but that the college as a whole also had limited awareness of the presence of military students in its undergraduate engineering programs.

Levels of awareness of the presence of military students by participants working within engineering colleges varied. However the participants working at the institutional level generally had good understanding of this presence at the institution and in engineering or STEM. Additionally, there was a promising narrative that was communicated by participants that work for a veteran support office during the interview process. Many of these participants described how they believed that awareness of military students on campus had been increasing over time. For example, Participant B said,

> "So when I first started in 2010, you know, like I said, it was myself as a program coordinator and a VA work study student. So we just yeah, so we took over the GI Bill process and continued to try to provide programing. Well, then we only had three to four hundred students. It was still that we were processing GI Bill benefits for those three to four hundred students where we're here at 600 or higher…. But in the process, about two years after we had taken over the processing, I was able to get that work study hired as a full time certifying official. So then we were able to kind of handle the programing and the certifying, and then that's continued to grow. Now we have two certify officials, myself, and now we have a staff assistant who just started this fall…. So the ability to serve veterans and to expand programing has increased over time."

Similarly, Participant E said,

> "Coming here out that ten years ago, we really had no program or anything at the [University]. So that was part of my job coming here as a warrant officer…. Coming here that that really became my personal commitment was what am I going to do to build a program here and learn what that program, what a program really is for veterans? And starting out at 2012, 2013, when we started to really look at that, there weren't very many things around the country that was really being done to support veterans in an extensive way at all. So we really just started building our program from the ground up on our own."

Currently, Participant E's institution has a stand-alone facility for veterans and military-affiliated students on campus, as well as priority registration for veterans. These and other participants communicated a general belief that with continued effort from the veteran support office and better access to awareness training for faculty and staff, awareness will continue to increase.

RQ 2: Institutional agent perceptions of the assets, capabilities, and identities that military students bring to engineering.

Regardless of whether participants had awareness of military student presence, all participants expressed their recognition of valuable attributes that military students bring with them to higher education and engineering programs. The most frequently mentioned attributes that participants described military students as having are provided in Table 2. Representative quotes from participants are also included in the table. At least two out of the six participants had to mention an item for it to be included in the table.

Table 2
Synthesis of participants perceptions of assets/attributes military students bring to higher education.

Assets/Attributes of Military Students	**Representative Quote**
Technical knowledge/practical experience	"We have a lot of people that come out of the service that don't have a degree, but they have years and years of experience in an engineering field." (Participant C)
Maturity	"You know, there are just so many different values [military students] have that are assets to campus that people can tap into that don't, you know, like sometimes the professors could tap into better if they wanted to. As far as especially… life experience." (Participant D)
Willingness to work hard	"I think [military students have] a willingness to [sic] to get in there and do…" (Participant A)
Leadership	"If there was some way we could really tap into that leadership capability our [military] students have, I think [sic] would be a better experience for everybody." (Participant E)
Resilience	"I said one unique skill that our veterans and service members students have that a lot of incoming freshmen don't is that we know how to overcome failure because we've experienced failure in life." (Participant B)

The most frequently mentioned attributes were technical and practical experience, both within engineering and in other fields. The second most common mentioned attributes were an increased level of maturity compared to traditional students and a willingness to work hard. Leadership and resilience were also mentioned as attributes that military students have. While not cited by participants as frequently, attributes of leadership and resilience have been recognized in previous work with military students in engineering education [20], [21]. For example, Participant A, who works in a college of engineering, said,

> "I mean, depending on their on [sic], you know, their role in the military, you know, they could bring in a lot of technical, practical knowledge on a lot of different things. And

then, you know, the engineering would kind of backup [sic] that they learn the background of that?"

Even though Participant A had limited awareness of military students in the college of engineering at their institution, they still recognized the potential skills military students can bring with them, depending on their previous role, to their engineering program. This, along with the fact that there were several attributes mentioned by multiple participants, suggests that participant backgrounds may not play a large role in their recognition of military student attributes. From participant to participant, whether the participant was a veteran, social worker, or engineer, they all recognized the technical experience, maturity, and hard work military students bring with them to higher education.

RQ 3: Promising practices for supporting military students in engineering and gaps, if any, in these practices.

Our data suggests that, within the U.S. western regional context, the amount and types of support for military students may vary substantially by institution. This finding holds true even though all the institutions represented by our data are public institutions located in the same western region of the United States, and many are designated as the land grant institution in their state. A comparison of common institutional-level supports across institutions and supports that were unique to a single institution are provided in Table 3. For each support that is unique to a single institution, the institution is indicated in parentheses.

Table 3
Comparison of institutional supports available at multiple institutions vs unique to an institution.

Supports Provided by Multiple Institutions	Supports Unique to an Institution
Veteran lounge space with amenities	Equine therapy (Participant B's institution)
VITAL program	Military awareness-focused class for undergraduates (Participant C's institution)
Student veterans organization	Transition class for veterans (Participant C's institution)
	Summer bridge program (Participant D's institution)
	Peer-advising program (Participant D's institution)

It should be noted a lounge/office space available to military students was the only support offered at every institution. At the time of participant interviews, not every campus utilized the Veterans Integration to Academic Leadership (VITAL) program available through the U.S. Department of Veteran Affairs (VA) [22]. Likewise, only some institutions had active veteran student organization (i.e., student veteran committees or student veteran clubs), despite participants consistently recognizing a need for social support for military students.

Despite substantial variance in participant's awareness and available support for military students in engineering at their institution, participants were more consistent in recognizing the

gaps in support at the institutional level. Table 4 gives the common gaps in support mentioned by institutional agents, as well as those only brought up by one participant. For each support only mentioned by one participant, that participant is given in parentheses.

Table 4

Comparison of gaps in support institutional agents see at their institution.

Gaps in Support Mentioned by Multiple Participants	Gaps in Support Mentioned by One Participant
Peer and faculty mentorship	Veteran Ally in each college (Participant C)
Social network for veterans	More class flexibility (Participant D)
Awareness training for faculty and staff	Free childcare (Participant D)
Better college planning for veterans	

Each participant mentioned peer and/or professional mentorship programs, social support, and networking opportunities for military students, as well as military awareness trainings for faculty and staff, as important programs they would like to see added at their institutions in the future. While participants C and D had their own specific ideas, they also mentioned the gaps in support brought up by the other participants. It should also be noted that Participant D works with both military students and adult learners, and their additional comments were in the context of both groups.

Some supports that were currently in place at some institutions do address gaps recognized by participants. For example, Participant C's institution offers a course required for most undergraduates that focuses on increasing awareness of military students for the general undergraduate population. This institution also offers a course that helps nontraditional students (but especially veterans) transition to higher education. Participant D's institution offers a summer bridge program for military students that includes funding for military students to participate in the program, remedial work in english and math, and opportunities to meet other military students. Both these courses and the bridge program support increased awareness of military students on campus and have the potential of providing a support system and sense of belonging for military students themselves.

In addition to these ideas, Participant C suggested that a veteran ally could be assigned to each college/department within their university:

> **"**…those students who are veterans or military affiliated can go to [that person] when they're feeling that frustration and feeling overwhelmed. But someone who not only has the common ground of being a veteran or spouse of a veteran or whatever, but also has that affinity of being in that department, understanding that student's goals, having that ally in each department could really go a long way where those students know who they can turn to."

Participant C believes that having an ally in each college/department would help military students feel more connected to their individual programs while also receiving the support they need for questions specific to their military and/or veteran status.

Discussion

Preliminary findings have important implications for improving support for military students at institutions in the western United States. First, they suggest that there is a disconnect between the awareness of military students at the institutional level and at the engineering college level. While participants believe that awareness and support for military students has increased over time, this is limited to the institutional level, rather than the engineering college level. This may be because military students feel more comfortable sharing their military identity with other military-affiliated students in spaces such as a veteran support office or inclusion center and prefer not to disclose this identity to others within their program of study [23]. Ultimately this preference may contribute to limited awareness of these students in the college. However, Participant D's mention of a networking event for military students in the mechanical engineering department suggests that there is an awareness of military students within that department and possibly within the entire engineering college at that institution. Whether that college-level awareness comes from working closely with the inclusion center or from military students being comfortable enough to disclose their military identity to those within their program of study, this implies that it is both possible and beneficial for colleges of engineering to increase their awareness and support of military students within their own programs.

Second, regardless of institutional agents' roles (institutional or engineering college level) and backgrounds (e.g., veteran, social worker, or engineer), they all recognized assets/attributes that military students bring to higher education. Many of the attributes institutional agents mentioned have also been noted in the engineering education literature [1], [4], [24]. This finding may result from the fact that five out of the six participants work in veteran support or institutional support offices and are more likely to work with military students directly, compared to institutional agents working in engineering colleges. It may be possible for institutional agents at both the institutional and engineering college level see the value of having military students on campus and that there may be a willingness to increase participation of military students in higher education due to this value. However, we need to hear from more institutional agents at the engineering college level before coming to a definitive conclusion.

Finally, it should be noted that every institution involved in this study is a public institution located in the western United States. This would imply that the size of the institution, available financial support, and overall attitudes toward military students should be similar across these institutions, making the variation in awareness and support between institutions surprising. And yet, those institutions that have more support for military students still brought up the same gaps in support that the "less supportive" institutions and much of the current literature mention[24], [25] . This finding suggests that while supports may not be similar across institutions, gaps in support are similar. Creating a program where these institutions can collaborate in sharing promising practices and combining resources to develop new approaches for support could be beneficial to filling these gaps in support for many military students pursuing higher education in the western United States.

In addition, some promising practices uncovered in this study are similar to best practices for military student support described within the literature. For example, Participant C's institution has a military awareness class for undergraduates and a transition class to help nontraditional

students (especially veterans) transitions to higher ed. Both classes use military principles in to benefit military and non-military students [24], [26]. Recognizing the important similarities in benefits between these classes and other classes in research lends weight to the idea that sharing these promising practices could be beneficial to increasing support for military students in the context of higher engineering education in the western United States.

Conclusion

Little research exists that examines military student experiences at institutions that may have limited support (and support dollars) for military students. This includes many 2- and 4-year public colleges and universities in the western United States. Despite this dearth of research, there is both a need and desire to increase awareness and support for military students at these institutions.

Preliminary findings from this study suggest that there is a disconnect between the awareness of military students at the institutional level and at the engineering college level. However, institutional agents at both the institutional and college levels identify and see the value of the assets/attributes military students bring with them to higher education and to engineering programs. Findings also suggest that, while support for military students at the institutional and engineering college levels vary across institutions, many institutional agents report the same or similar gaps in support at their institution and would likely benefit from a program that allows for collaboration to share promising practices.

Institutional agents also reported that institutional support for military students has generally increased over time; they suggested that ongoing efforts will continue to increase military student awareness over time. Further work is needed to unpack the relationships between work done by veteran support offices, financial support, and the awareness and support available for military students at an institution. Such work may lead to important insights on how to better improve military student support across multiple institutions.

This study will continue to generate data from institutional agents working with military students, especially those working within the college of engineering, to better define the difference in awareness and gaps in support for military students pursuing an undergraduate engineering degree.

ACKNOWLEDGEMENTS

This material is based upon work supported by the National Science Foundation under Grant No. 2045634. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of National Science foundation.

References

[1] H. Wilkinson and A. Minichiello, "U.S. Military Students in Civilian Undergraduate Engineering Programs: A Narrative Review of the Student Veteran and Servicemember Literature," presented at the 2022 ASEE Annual Conference & Exposition, Aug. 2022. Accessed: Feb. 13, 2023. [Online]. Available: https://peer.asee.org/u-s-military-students-in-civilian-undergraduate-engineering-programs-a-narrative-review-of-the-student-veteran-and-servicemember-literature

[2] B. J. Novoselich, J. L. Hall, K. A. Landry, J. B. Main, and A. W. Dean, "Supporting Veteran Students Along Engineering Pathways: Faculty, Student, and Researcher Perspectives," presented at the 2017 ASEE Annual Conference and Exposition, Columbus, Ohio, Columbus, Ohio: American Society for Engineering Education, Jun. 2017. doi: 10.18260/1-2--28888.

[3] A. G. Eggleston and R. J. Rabb, "Reaching and Including Veteran Students in the Technical Communication Classroom," presented at the ASEE Annual Conference & Exposition, Salt Lake City, UT, Salt Lake City, UT: American Society for Engineering Education, 2018. doi: 10.18260/1-2--30916.

[4] R. C. Atkinson, C. Mobley, C. E. Brawner, S. M. Lord, M. M. Camacho, and J. B. Main, "I Never Played the 'Girl Card': Experiences and Identity Intersections of Women Student Veterans in Engineering," in *125 Years at the Heart of Engineering Education*, Salt Lake City, UT: American Society of Engineering Education, Jun. 2018.

[5] C. E. Brawner, S. M. Lord, C. Mobley, M. M. Camacho, and J. B. Main, "Race, Veteran, and Engineering Identities among Black Male Student Veterans," presented at the 2019 CoNECD - The Collaborative Network for Engineering and Computing Diversity, Crystal City, Virginia, Crystal City, Virginia: American Society for Engineering Education, 2019a.

[6] J. H. Lim, P. T. Tkacik, C. G. Interiano, J. L. Dahlberg Jr., and C. E. Nowell, "Engineering as a Pathway to Reintegration: Student Veterans' Transition Experience into Higher Education and Civilian Society," presented at the 2016 ASEE Annual Conference and Exposition, New Orleans, LA, New Orleans, LA: American Society for Engineering Education, 2016.

[7] C. Mobley, C. E. Brawner, S. M. Lord, J. B. Main, and M. M. Camacho, "Exploring the experiences of first-generation student veterans in engineering," presented at the CoNECD - The Collaborative Network for Engineering and Computing Diversity Conference, Crystal City, Virginia, Crystal City, Virginia: American Society for Engineering Education, 2018.

[8] R. A. Cooper, M. Goldberg, M. Milleville, and R. Williams, "The Experiential Learning for Veterans in Assistive Technology and Engineering (ELeVATE) program," *J. Mil. Veteran Fam. Health*, vol. 2, no. 2, pp. 96–100, 2016.

[9] M. M. Camacho, S. M. Lord, C. Mobley, J. B. Main, and C. E. Brawner, "Transitions of Student Military Veterans into Engineering Education," *Soc. Sci.*, vol. 10, no. 6, p. 228, Jun. 2021, doi: 10.3390/socsci10060228.

[10] C. E. Brawner, S. M. Lord, C. Mobley, J. B. Main, and M. M. Camacho, "How the 'Needs of the Force' Impact Navy and Marine Corps Veterans' Decision to Major in Engineering," presented at the 126th AEEE Annual Conference and Exposition, Tampa, FL, Tampa, FL: American Society for Engineering Education, 2019b.

[11] S. F. Barrett, C. H. G. Wright, and M. Martinez, "Veteran's Transition Course at the University of Wyoming," presented at the 2017 ASEE Annual Conference & Exposition,

Jun. 2017. Accessed: Apr. 07, 2022. [Online]. Available: https://peer.asee.org/veteran-s-transition-course-at-the-university-of-wyoming
[12] C. Mobley, J. B. Main, S. M. Lord, C. E. Brawner, and M. M. Camacho, "Institutional Agents' Roles in Serving Student Veterans and Implications for Student Veterans in Engineering," presented at the ASEE 126th Annual Conference and Exposition, Tampa, FL, Tampa, FL: American Society for Engineering Education, 2019. doi: 10.18260/1-2--32971.
[13] J. H. Lim, R. Saunders, P. T. Tkacik, J. L. Dahlberg, and M. E. Levan, "Affirming Identity Through Authentic Mentoring in a Safe Space: Supporting Military Veterans in an Engineering Graduate Program," presented at the 2020 ASEE Virtual Annual Conference Content Access, Jun. 2020. doi: 10.18260/1-2--34098.
[14] C. McCall and C. Edwards, "New Perspectives for Implementing Grounded Theory," *Stud. Eng. Educ.*, vol. 1, no. 2, p. 93, Feb. 2021, doi: 10.21061/see.49.
[15] K. Charmaz, "Constructionism and the grounded theory method," *Handb. Constr. Res.*, vol. 1, no. 1, pp. 397–412, 2008.
[16] M. Q. Patton, *Qualitative Research & Evaluation Methods*, 3rd ed. Thousand Oaks, CA: SAGE, 2002.
[17] "Audio Transcription Software | Speech to Text to Magic," *Trint*. https://trint.com (accessed Mar. 22, 2022).
[18] K. Charmaz and L. Belgrave, "Qualitative interviewing and grounded theory analysis," *SAGE Handb. Interview Res. Complex. Craft*, vol. 2, pp. 347–365, 2012.
[19] J. Saldana, *The Coding Manual for Qualitative Researchers*. SAGE, 2021.
[20] J. B. Main, M. M. Camacho, C. Mobley, C. E. Brawner, S. M. Lord, and H. Kesim, "Technically and Tactically Proficient: How Military Leadership Training and Experiences are Enacted in Engineering Education," *Int. J. Eng. Educ.*, vol. 35, no. 2, pp. 446–457, 2019.
[21] N. Salzman, T. B. Welch, H. Subbaraman, and C. H. G. Wright, "Using Veterans' Technical Skills in an Engineering Laboratory," presented at the ASEE Annual Conference and Exposition, Salt Lake City, UT, Salt Lake City, UT: American Society for Engineering Education, 2018. doi: 10.18260/1-2--31217.
[22] "Veterans Integration To Academic Leadership (VITAL)," *Veterans Affairs*, Oct. 20, 2022. https://www.va.gov/new-york-harbor-health-care/work-with-us/jobs-and-careers/veterans-integration-to-academic-leadership-vital/ (accessed Feb. 28, 2023).
[23] J. B. Main, M. M. Camacho, C. Mobley, C. E. Brawner, and S. M. Lord, "Using focus groups to understand military veteran students' pathways in engineering education," presented at the 123rd Annual ASEE Conference and Exposition, New Orleans, LA, New Orleans, LA: American Society for Engineering Education, Jun. 2016.
[24] D. B. Stringer and M. McFarland, "Veterans' Contributions to Enhancing the Capstone Learning Experience of Engineering Cohorts," presented at the ASEE Annual Conference and Exposition, New Orleans, LA, New Orleans, LA: American Society for Engineering Education, 2016. doi: 10.18260/p.27180.
[25] C. Mobley, J. B. Main, C. E. Brawner, S. M. Lord, and M. M. Camacho, "Pride and promise: the enactment and salience of identity among first-generation student veterans in engineering," *Int. J. Eng. Educ.*, vol. 35, no. 1A, pp. 35–49, 2019b.

[26] J. L. Dahlberg, J. H. Lim, and P. T. Tkacik, “Development of Veteran-friendly Military Technology and Instrumentation Mechanical Engineering Course,” in *2020 ASEE Virtual Annual Conference*, 2020.