Board 220: CAREER: 'Support our Troops': Re-storying Student Veteran and Service Member Deficit in Engineering Through Professional Formation and Community Advocacy: YEAR 3

Dr. Angela Minichiello, Utah State University

Angela Minichiello is a US Army veteran, registered professional mechanical engineer, and an Associate Professor in the Department of Engineering Education at Utah State University. She is a 2021 NSF CAREER awardee and currently serves as Co-Director of Engineering Workforce Development for the NSF-sponsored ASPIRE Engineering Research Center. Her research examines issues of access, equity, and identity in the professional formation of engineers and a diverse, transdisciplinary engineering workforce.

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 and a M.S. in Engineering Education from Utah State University.

Samuel Shaw, Utah State University

Samuel Shaw is an undergraduate student in Mechanical Engineering at Utah State University.

Allison Miles, Utah State University

Allison Miles is an undergraduate student in Mechanical Engineering at Utah State University.

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1. Introduction

There is an urgent need to recruit, retain, train, and sustain a diverse engineering workforce able to meet the socio-technical and environmental challenges of 21st century society. Together, student veterans and service members (SVSM) are a unique yet understudied group that comprises substantial numbers of those historically underrepresented in engineering based on their race, ethnicity, gender, and ability [1]. Specifically, post 9/11 veterans, who are more diverse than any previous cohort of U.S. veterans, comprise substantial sub-populations of veterans who identify as Black (15%), Hispanic/Latinx (12%), and women (17%) [2]. Approximately 62% of veterans are first generation students [3]. With 36% reporting a service-connected disability, post-9/11 veterans have the highest number of service members who separate from the military with a disability of any veteran cohort in history [2]. These factors, in combination with technical interests and skills, maturity and life experience, and leadership and teamwork training, make SVSM ideal candidates for supporting engineering education in meeting workforce demands well into the 21st century [4].

1.2 Project Goals and Work Plan

This NSF CAREER project aims to advance full participation of SVSM within higher engineering education and the engineering workforce. The project plan comprises a *Research Plan* to develop deeper understandings about how SVSM participate, persist, and produce professional identities in engineering education, and an *Education Plan* to place new understandings into practice through collaborative development, implementation, dissemination, and sustainment of targeted anti-deficit, assets-based educational and support resources for undergraduate SVSM in engineering.

The research plan builds from existing cross-sectional, transition-focused research with student veterans, documented in the engineering and higher education literature, using a longitudinal, narrative inquiry research approach [5] and an innovative, two-strand theoretical framework. The theoretical framework centers social theories of identity [6], [7], [8], [9] in one strand and critical theories, including Veteran Critical Theory [10] and Community Cultural Wealth [11], in the second strand. In doing so, this work aims to interpretively explore SVSM professional identity development and, concurrently, critically examine higher engineering education structures and in engineering programs at 2- and 4- year public institutions in the western United States using narratives of SVSM experience as both phenomenon and method [12].

Research plan work is guided by two research questions (RQ) and sub-questions:

1) How do SVSM participate and persist in undergraduate engineering education?
   a) How do personal and professional assets combine to create SVSM community cultural wealth in engineering?
   b) How do SVSM negotiate educational structures to participate and persist in engineering?

2) During their undergraduate engineering education, how do SVSM produce engineering identities?
    a) How do SVSM experience transitions between military, civilian, academic, professional, and engineering related contexts?
    b) How do SVSM engage in engineering professional identity development?

The integrated education plan draws from both grounded theory methods [13], [14] and design-based research [15], [16] approaches to collaboratively develop, implement, and broadly disseminate anti-deficit, assets-based training materials and resources to a wide variety of undergraduate engineering stakeholders, including, faculty, staff, advisors, administrators, and military and non-military students. Concurrent with the research plan, the education plan works to build and connect local theory to practice by characterizing the current support structures available for SVSM in engineering in our region, and develop, implement, and assess new supports and interventions based on SVSM identities and knowledge about their required and preferred resources.

2. Major Activities and Outcomes

To begin, we provide a brief summary of project work completed in prior project Years 1 and 2, which was previously detailed by [17]. Next, we describe in detail the project activities and outcomes accomplished during the current project Year 3.

2.1 Year 1 Brief Summary

During Year 1 (Jul 2021-Jul 2022), the Principal Investigator (PI) hired an engineering education graduate student on to the project. Together, we commenced work on the project, including attaining institutional review board (IRB) approval for both the research and education plans and developing an interview protocol for SVSM for the research plan and one for institutional agents (IAs) for the education plan. We began recruiting SVSM participants for the research plan and IA participants for the education plan through the use of purposive and snowball sampling [18].

By the end of Year 1, we had completed nine one-on-one, semi-structured interviews with institutional agent participants, and two SVSM participants had entered the longitudinal study for the research plan. Institutional agent participants represented five initial partnering institutions and included IAs from both colleges of engineering and veteran resource offices. SVSM participants included one White male, Air Force National Guard Servicemember studying mechanical engineering and one Bi-racial Asian female, Army National Guard Servicemember studying civil engineering. Initial data and developing findings from both sets up participants are described in a paper published in the ASEE 2022 Annual Conference proceedings [17].

2.2 Year 2 Brief Summary

In Year 2 (Jul 2022-Jul 2023), the PI and graduate researcher worked with two undergraduate student researchers on project work over the course of 10 weeks in the summer of 2022 through an NSF funded Research Experience for Undergraduates (REU) project conducted with Utah

State University's (USU) Engineering Education department. In addition to mentoring, the two REU students participated in research including conducting interviews with IAs, preparing and analyzing qualitative data, and developing a research paper and poster that was subsequently presented at the ASEE 2023 annual conference [19]. Additionally, the graduate student and undergraduate researchers began the work of expanding a narrative literature review on military students in engineering education published by the team in the proceedings of the ASEE 2022 annual conference [20] into a systematic literature review.

We continued to recruit and generate data with SVSM participants in support of the research plan. To aid recruitment efforts, the PI traveled to one current (College of Southern Idaho) and two potential partner institutions (Idaho State University and Boise State University) in fall 2022 to develop collaborations with Veteran Resource Office and college of engineering personnel and to setup approaches for SVSM recruitment. Four additional SVSM students entered the longitudinal research study, including two National Guard servicemembers, one Army veteran, and one Navy veteran. Data was generated with SVSM participants through one-one-one interviews and narrative journal entries. Ongoing analysis is situated within the theoretical frameworks used for the research plan, including Social Identity Theory [7], Multiple Dimensions of Identity Theory [6], [9], Veteran Critical Theory [10] and Community Cultural Wealth [11]. A detailed description of the emergent analysis was published in the proceedings of the 2023 ASEE annual conference [19].

In support of the education plan, we continued to recruit and generate data with IA participants across partner institutions. These activities included recruiting four IA participants from two new institutions. Data analysis for 13 institutional agents occurred in Year 2. Preliminary findings from data analysis were published in the proceedings of the 2023 ASEE annual conference [21]. To further support the development of assets-based deliverables in the education plan, we initiated collaborations with professionals outside of engineering, including the USU Inclusion Center LGBTQ+ and Allies Program coordinator, who provided LGBTQ+ awareness training to our department and has agreed to share resources with us as we develop our own awareness training for SVSM. We also initiated collaborations with two professionals from the Salt Lake City Veteran's Administration (VA), both of which regularly provide SVSM awareness training to institutions in the surrounding region.

2.3 Year 3 Detailed Summary

2.3.1 Advancing the Research Plan

2.3.1.1 Research Capacity Expanded through Undergraduate Research Mentorship. In Year 3 (Jul 2023-Jul 2024), following our successful work with the REU students during the summer of 2022, the PI hired two undergraduate engineering student researchers onto the project from [school name] college of engineering; the PI and graduate researcher mentor both undergraduates in educational and qualitative research methods generally and narrative inquiry methods specifically. In addition to their engagement in research mentoring, the two undergraduate researchers have completed Human Subjects Research and Responsible Conduct of Research training and have become actively involved in research activities that contribute to the overall project. ***Based on their work this far, we anticipate that the undergraduate researchers will***

provide key support and added capacity during ongoing generation and analysis of SVSM narrative data for the research plan and development of deliverables for the education plan.

Currently, the undergraduate researchers are engaged in the development of assets-based SVSM awareness training for university faculty, staff, and administrators. This work requires them to dive into the literature to understand best practices in SVSM awareness training and allyship (e.g., Dillard & Yu, 2016, 2018). Additionally, the undergraduate researchers are continuing the work of expanding the narrative literature review on SVSM in public engineering programs published/presented at the 2022 ASEE Annual Conference [20] into a systematic literature review suitable for a journal publication. Both undergraduate researchers are also active in quantitative and qualitative in data collection and/or analysis for two collaborative projects, with veteran studies scholars from other institutions (i.e., school names), that are related to SVSM in engineering. So far, this work has resulted in two published articles that will be presented at the 2024 ASEE Annual Conference: one about IA beliefs and stereotypes of veterans and one about veteran pathways to engineering careers [24], [25].

2.3.1.2 SVSM Participant Recruitment Approaches Strengthened. The research team continues to recruit SVSM participants from collaborating institutions and generate longitudinal narrative data with them through personal narrative journal entries and one-on-one narrative interviews. The current participant pool, as well as a list of SVSM who have volunteered but have not yet been officially enrolled in the study, are shown in Table 1.

Table 1: Demographics of Longitudinal Study Participants as of Jan 2024

	Race/ ethnicity	**Gender ID**	**Branch/ Service Component**	**Engineering Major**	**Program Year/ Age**	**Gap btw high school - college**	**Other Salient Identities**	**Study Progress**
1	White	male	Air Force National Guard	mechanical	4th yr age 21	3 months		Complete graduated
2	Bi-racial/ Asian	female	Army National Guard	civil	3rd yr age 21	4 months	military family, spouse	Complete graduated
3	White	male	Air Force National Guard	mechanical	1st yr age 19	2 months	military family	In Progress
4	White	male	Army National Guard	mechanical	2nd yr age 20	15 months	first generation	In Progress
5	White	male	Army Veteran	civil	1st yr age 21	3 years	disability	In Progress
6	Black	male	Navy Veteran	civil/environ-mental	1st yr age 25	7 months	first generation	In Progress
Volunteers who have taken the screening survey but have not yet formally enrolled into the study								
	White	male	Army Reserves Veteran		age 44	3 months	dependents disability First generation	Volunteer

	White	female	Army National Guard			3 months	first generation	Volunteer
	White	male	Air Force Veteran		age 27	4 years		Volunteer
	Latinx	male	Army National Guard		age 27	6 months	first generation	Volunteer
	White	female	Army Veteran		age 33	11 years	dependents disability	Volunteer
	White	male	Army Reserves		age 22	26 months	disability	Volunteer
	White	male	Air Force Veteran			3 months	first generation	Volunteer
	White	male	Navy Veteran		age 31	3 months		Volunteer
	White	female	Coast Guard Veteran		age 29	7 months	disability	Volunteer
	White	male	Army Veteran		age 29	12 years		Volunteer
	White	male	Navy Veteran			4 years	first generation	Volunteer

To advance the recruitment of SVSM participants generally, the PI again traveled, this time to two partner institutions (University of Wyoming and Colorado State University) in fall 2023 to develop collaborations with Veteran Resource Office personnel and establish approaches for SVSM recruitment at these institutions. These visits appear to be a viable strategy based solely on the numbers of participants and volunteers for the study we have this far.

In reviewing the participant and volunteer demographic data shown in Table 1, we feel we are recruiting diverse participants and volunteers in terms of binary gender (23.5% female), military branch and service component, engineering program year and age, gap between high school and college, and other salient identities— particularly disabled and first-generation identities. However, we would like to see more intersectional diversity among our participants and volunteers in terms of race, ethnicity, and non-binary gender. In thinking about how to recruit more racially, ethnically and gender diverse participants, we've come up with the idea that, in addition to recruiting through the VROs and the engineering colleges, we will consider recruiting within diversity and inclusion focused student engineering clubs, such SWE, NSBE, SHPE and OSTEM. In those venues, we may be able to reach engineering SVSM who have racial, ethnicity and gender minoritized identities that are more salient than their military or veteran identities. Being recruited within environments that support these salient identities may provide diverse SVSM more impetus and motivation to volunteer and participate in the study.

During Years 1-2, we have also had difficulties contacting (via email) SVSM volunteers after they have taken the online survey and said they are interested in participating in the study. Oftentimes, substantial time goes by before the PI can make contact (via email) with each volunteer and schedule an appointment for informed consent, which is necessary before their formal entry into the study can occur. To improve this process, the team is taking two new approaches. First, we have requested and received an institutional project email address that is accessible by all members of the research team. The graduate student and, ultimately, the undergraduate researchers will assist the PI by confirming interest with each volunteer and

setting up an informed consent meeting between them and the PI. Using this team approach, we hope to reduce the time it has been taking to bring volunteers into the study. For the second new approach, we have amended our IRB protocol procedures to allow us to request volunteers provide either a contact email address and/or phone (text) number in the online screening survey. In some cases, we believe that delays in contacting SVSM volunteers is that they may not check their email very often. Thus, we've added the capability to contact volunteers via text if they prefer, which may be a more efficient way of establishing and maintaining contact with those volunteers and participants that use text as their main communication tool.

2.3.1.3 Systematic Literature Review Methodology Refined. In Summer 2023, the PI and graduate researcher attended the Institute for Meta-Synthesis (IMS) intensive workshop by TERC in Cambridge, MA, funded by the NSF (DRL-2024967). Based on what we learned in this workshop, we made updated our methodological approach, using PRISMA guidelines [26] and meta- synthesis approaches, to expand the initial narrative review published in 2022 [20] into a full systematic literature review. Our aim in expanding this review is to ensure we are including and reporting on all available literature relative to our focus on U.S. veteran and service members experience in undergraduate engineering programs at public institutions. We hope to reach a broader audience through publication of this work in a scholarly journal and to provide a useful starting point for others interested in research with SVSM in engineering.

2.3.2 Advancing the Education Plan

2.3.2.1 Institutional Agent (IA) Interviews Completed. Work with institutional agents (IAs) was completed in Spring 2023, resulting in 14 interviews across seven different institutions (Table 2), as well as a virtual member check meeting in May 2023 in which six participants from three of the seven institutions attended. Participants at the member check meeting represented both colleges of engineering (2 participants) and veteran resource offices (4 participants).

Table 2: Education Plan Institutional Partners and IA Interviews

	Partner Institution* Type	**Recognition as Military Friendly**	**Veteran Resource Office IA Interviews**	**College of Engineering IA Interviews**
1	4-year public University Land grant	None	4	3
2	4-year public University Land grant	None	1	0
3	4-year public University Land grant	Yes**	1	0
4	4-year public University Land grant	None (private donor support)	1	0
5	2-year public community college	None	1	0
6	4-year public University Land grant	Yes***	1	0
7	4-year public University	None	1	1

* All partner institutions are located within the U.S. western region (i.e., Colorado, Idaho, Utah, Washington, and Wyoming).
** Ranking on Military Times "Best for Vets" list.
***Top 10 Military Friendly School Rank from MilitaryFriendly.com

Data analysis of the 14 interviews and member check meeting was completed in the summer 2023 and resulted in the development of six major themes. These themes are given in Table 3.

Table 3: Major themes from IA Interviews

1	Institutional agents agree that awareness is important for military student success but remains fragmented across institutional entities.
2	Effective support of military students recognizes the nuances inherent to military students' identities and experiences.
3	Military students face a variety of challenges based on their military and transitional experiences and nontraditional student status.
4	Military students have developed perspectives, skills, and attributes through their military experience and culture that can be valuable assets during their higher education and engineering education.
5	Current supports available for military students, as well as ideas for new supports, are focused in four areas: transitions to higher education, quality of life, social opportunities, and campus inclusion.
6	An institution's context, including its size, community support, and location, impacts institutional agents' abilities to support military students.

These themes were used to address research questions developed as part of the graduate student's master's thesis work [27] which was published in October 2023. After defending her thesis, the graduate student graduated with a master's in engineering education and began work on her PhD in the same field.

2.3.2.2 Education Plan Findings and Implications for Deliverables. The six major themes resulting from this thesis highlighted the need for educational stakeholders and across institutional entities to develop awareness of SVSM issues, and that this awareness should include an understanding of the nuances of SVSM's identity and experiences, and how SVSM share some of the same experiences and responsibilities that nontraditional students in higher education do. ***This finding helped us conceptualize the synergy existing between these two student populations (i.e., military and nontraditional) and begin to consider the benefits of combining military student supports with nontraditional students supports, realizing that nontraditional students, if trained, may serve as civilian peer allies for the military students.***

Thesis findings also showed that an institution's context, including its size, location, and community makeup, is likely to affect they approaches that institutions use to support SVSM at both an individual college and university level. IA participants believed that institutional context is an important factor to consider when developing veteran awareness and support programs for SVSM. ***This finding provides support for the project design wherein we are researching with and developing educational plan support among institutions with a similar regional context: 2-yr and 4-yr public institutions in the U.S. western region.*** Participants also identified

continuity of care as an important element of institutional support, regardless of the institutional context [27]. Continuity of care is the process of providing continuous access to resources and support, both within and between institutional entities. While continuity of care is important for all students, it is essential for SVSM, who often rely on different institutional entities like college advisors and veteran resource offices to meet requirements for tuition and housing funding. This means that veteran resource staff members should adequately document processes to support SVSM in the case of staff member turnover, and faculty, staff, and administration in the college of engineering should be aware of SVSM's needs and available resources. This includes adequately training IAs in roles supporting SVSM, building better awareness of SVSM in colleges of engineering, and creating and maintaining communities for SVSM, including veteran student clubs and peer mentorship programs. Our development of an asset-based military student awareness training seeks to address the college of engineering side of continuity of care by educating faculty, staff, administration, and non-military students about SVSM experiences in engineering.

Using these findings, the research team charted the course forward by defining and refining the goals for the Education Plan deliverables:

In Year 3, based on the literature review findings , thesis findings about IA perceptions of SVSM support in engineering, and collaborations with multiple IAs across our partner universities, we determined that we would develop two vital SVSM educational supports that are not currently (or effectively) being offered at the PI's institution, and potentially are other regional partner institutions:

1) ***an anti-deficit, assets-based military student awareness*** training for faculty, staff, administration, and non-military students that can be tailored for use within the college of engineering as well as the university as a whole, and

2) a ***stakeholder-responsive, semester-long engineering orientation-style seminar for military and nontraditional students*** soon after they enroll in the college of engineering.

Both the assets-based awareness training and the engineering orientation-style seminar are being developed in ways (i.e., online resources, remotely accessible, modular curriculum design) that that will make them adaptable use within other colleges and institutions in our region, or more broadly, that share similar contexts.

Anti-Deficit, Assets-based Military Student Awareness Training. The SVSM awareness training for faculty, staff, administration, and students is currently being developed for general audiences and for STEM specific audiences. In addition to using emergent finding from working with IAs, the training also draws from current literature on SVSM in engineering programs [28], [29], [30] and "Green Zone" style training for faculty and staff [22], [23], [31]. The research team is also collaborating with [university] veteran resource office staff and representatives from the [state] VA, who have shared access to their current awareness training materials. The research team is adding to current awareness training materials using an asset-based approach [32] to describe and discuss SVSM's experiences in each of three types of transition experiences that military service members experience: 1) transitioning between garrison and deployment, 2) transitioning

out of the military (i.e., separating from the military), and 3) transitioning into higher (engineering) education. The awareness training will also provide information on resources currently available to SVSM at the college and institutional level.

Stakeholder-responsive Military and Non-Traditional Engineering Seminar. In working with IAs, the research team found that one impactful technique used to support SVSM is building a community that combines both SVSM and adult learner/non-traditional student needs [27]. Indeed, many of the challenges SVSM face stem from their nontraditional student status, including their older age and additional family responsibilities [21], [33]. Combining support for SVSM and non-traditional students together has the potential to address institutional limitations in resources that make it difficult for an institution to create college level support outside of a veteran resource office by looking at the needs of a larger group of students. Additionally, supporting a larger group of students is more appealing to engineering administrations that may be hesitant to allocate funding to support SVSM. as they may be seen to make up a "small" segment of the engineering student population at some institutions [1].

With these issues in mind, the research team is starting to develop an engineering orientation-style seminar for SVSM and nontraditional students. The purpose of this semester-long seminar is to support SVSM and nontraditional students in developing a community and provide both faculty and peer mentoring throughout the semester, as well as learning supports for students starting or transitioning into an engineering degree. Supports will likely include math and writing help sessions, connections to faculty/industry mentors, career preparation activities, info sessions from the veteran resource office, in addition to other resources identified by students. This seminar is being developed using a design-based research approach over project Years 3 - 5 via iterative design, implementation, and feedback from stakeholders across our partner institutions, within our institutions within the college of engineering and veteran resource office, and SVSM and nontraditional engineering undergraduate students. The final deliverable will include curriculum documentation so that other institutions can implement a similar seminar with adjustments made based on their own needs.

3. Evaluation of Education Plan Outcomes

Another important element of this CAREER project is external evaluation of the education plan work to ensure that project goals are being met in a timely and appropriate manner. As part of the evaluation process, the project has an external evaluator who meets with the PI approximately once every quarter. Additionally, the PI provides the project valuator with online access to the research teams' weekly meeting notes. The evaluator provides a yearly evaluation report that is included in the annual project report that goes to the NSF each year.

In April 2023, the project evaluator visited the PI's institution, where they met in person with the research team. They also gave an invited talk to the department's graduate students about evaluation in federally funded projects as part of the department's annual spring research seminar. The team again met with the project evaluator again in person at the ASEE 2023 annual conference in Baltimore, MD.

4. Project Dissemination

Our dissemination of research knowledge and education products for a variety of audiences is ongoing. In Year 1 we published/presented four conference papers and gave two stand-alone scholarly presentation. In Year 2, we published/presented two conference papers and gave one stand-alone scholarly presentation.

4.1 Years 1-2

Year 1 and 2 publications and presentations toward research and education plan goals are listed below and described in detail in [17].

Minichiello, A. (March 2021). "Military Friendly: Critically Considering the Experiences of Military-connected Students in Undergraduate Engineering Education," Purdue University, School of Engineering Education, Engineering Education Research Seminar. (Invited, virtual).

Kirchner, M. & Minichiello, A. (April 2022). Socialization to support civilian professional identity development among student veterans. Academy of Human Resource Development (AHRD) Annual Conference, Arlington, VA (hybrid).

Minichiello, A. & Kirchner, M. (April 2022). Theorizing military student transitions in U.S. higher education. American Education Research Association (AERA) Annual Meeting, San Diego, CA (hybrid).

Minichiello, A. (June 2022a). Thinking critically about critical research with military undergraduates in engineering education. *Proceedings of the 129th Annual ASEE Conference & Exposition,* Minneapolis, MN.

Minichiello, A., Wilkinson, H. (June 2022). CAREER: 'Support our troops': Re-storying student veterans and service member deficit in engineering through professional formation and community advocacy: Year 1. 2022 ASEE Annual Conference & Exposition, Minneapolis, MN.

Wilkinson, H. & Minichiello, A. (June 2022). U.S. military students in civilian undergraduate engineering programs: A narrative review of the student veteran and service member literature. Proceedings of the 129th Annual ASEE Conference & Exposition, Minneapolis, MN.

Minichiello, A. (November 2022b). "Tell Me Your Story Again: Using Longitudinal Personal Narrative to Examine the Experiences of Military Undergraduates in Higher Education," Boise State University, College of Engineering, Boise, ID. (Invited).

Minichiello, A., Wilkinson, H.(June 2023) CAREER: 'Support our troops': Re-storying student veterans and service member deficit in engineering through professional formation and community advocacy: Year 2. 2023 ASEE Annual Conference & Exposition, Baltimore, MD.

Wilkinson, H., & Minichiello, A. (June 2023). WIP: Institutional agents' awareness and asset-based perceptions of military students in undergraduate engineering programs at public institutions

in the western United States. *Proceedings of the 130th Annual ASEE Conference & Exposition,* Baltimore, MD.

4.2 Year 3

In Year 3, the team has submitted three conference papers to the 2024 annual ASEE conference for publication/presentation, including synergistic work with collaborators from other institutions, and has published one book chapter in an edited volume. The research team has also been invited to give two poster presentations at the 2024 CoNECD Conference, as well as one invited presentation for the Military and Veteran Division (MVD) of ASEE at the ASEE 2024 Annual Conference. During Year 3 there has also been one master's thesis published. These publications and presentations are described below.

4.2.1 Systematically synthesizing the research literature related to SVSM in engineering:

Wilkinson, H., Minichiello, A., Shaw, S., & Miles, A. (in preparation*).* A systematic review of literature related to U.S. military veterans and service members in public undergraduate engineering programs in the United States.

In this work, the project team is working to expand a systematized narrative literature review published in 2022 [20] into a full systematic literature based on PRISMA guidelines [26] and meta synthesis techniques. The goal of this paper is to establish a basis of literature on military students studying engineering at public institutions, analyze the state of literature with these students, and describe areas where more research is needed to encourage fellow scholars to pursue research in this area.

4.2.2 Developing a conceptual model of SVSM professional identity development in engineering:

Kirchner, M. and Minichiello, A. (2024). At war with ourselves: Academic professional identity development in the aftermath of military service. A. Muthanna and M. Khine (Eds). *Professional identity development: Continuing and enhancing professionalism in higher education*. Routledge.

In this work, the authors —who are both military veterans—examined the process of transition from military to academia by collaboratively constructing and exploring first-hand reflective accounts of our experiences. In doing so, we sought to better understand our development as civilian academic professionals in the wake of our military service, as well as the ways in which our veteran identities support as well as hinder our professional development in the academy.

Eggleston, A., Minichiello, A., Miles, A., Wilkinson, H., Shaw, S., Rabb, R., Dahlberg, J., Crawford, B., Barton, O., Brown, P., Kime, C., Sheppard, M., & Weathersbee, T. (expected June 2024). Transition to the civilian workforce: Themes and lessons from military service and culture. *Accepted to the 131st Annual ASEE Conference & Exposition,* Portland, OR.

This work summarized the findings from a qualitative thematic analysis of a diverse military veteran panel session sponsored by the ASEE Military and Veterans Division during the 2023

annual ASEE Conference. Using the recorded audio recording of the panel session, members of MVD leadership and the panelists, together, engaged in collaborative exploratory research to examine and coproduce theoretical and practical knowledge, and ideas for "next steps" in research and practice related to veteran and service member pathways to engineering.

4.2.3 Understanding perceptions and advocating for awareness of military students in engineering education:

Phillips, G. A., Heckrote, R., Minichiello, A., Garcia-Hills, M., Barnes, D., & Polen, B. (March 2024). From Washington to water coolers: How veteran policy is communicated across campus. *Veteran Knowledge Community (VKC) Publication, 2024 NASPA Annual Conference,* Seattle, WA.

In this work, we identify issues related to the dissemination and operationalization of federal and state veteran policies at institutions of higher education. We also share promising practices that policy issuing agencies, campus leaders and administration, and the military can jointly and collaboratively use to alleviate gaps in information among student veterans and servicemembers.

Eggleston, A., Rabb, R., Mobley, C., Feinhauer, D., Dahlberg, J., Minichiello, A., & Shaw, S. (expected June 2024). Faculty and staff perceptions of military veterans pursuing an engineering degree. *Accepted to the 131st Annual ASEE Conference & Exposition,* Portland, OR.

In this study, we administered a quantitative survey instrument across several academic institutions to surface existing stereotypes and perceptions about military veterans held by faculty and staff working in U.S. higher education institutions. We report on preliminary results from mixed model logistic analyses that indicate the biases about military veterans are active in non-veteran faculty and staff populations.

Wilkinson, H. (October 2023). Understanding support for student veterans and servicemembers in public undergraduate engineering programs [Utah State University]. Master's Thesis. https://digitialcomons.usu.edu/etd2023/15

The purpose of this Master's Thesis was to understand the support currently available for and institutional agent perspectives of student veterans and service members studying engineering at public institutions in the western region of the United States, a context previously understudied in military student research. Findings from this thesis have led to plans for the development of an asset-based awareness training for faculty, staff, administration, and non-military students, as well as an orientation-style seminar to support student veterans and service members in engineering degrees.

4.2.4 Project Dissemination

Minichiello, A., Wilkinson, H., Shaw, S., & Miles, A. (February 2024). CAREER: 'Support our Troops': Re-storying student veteran and service member deficit in engineering through professional formation and community advocacy. *Invited poster presentation at the 2024 CoNECD Conference, Crystal City, VA.*

This poster presentation provides a current overview of the project and disseminates emerging findings for both the research and education plan.

Wilkinson, H. (February 2024). Developing an assets-based seminar for military and nontraditional students in engineering using a community of practice framework: Research to Practice. *Invited poster presentation at the 2024 CoNECD Conference, Crystal City, VA.*

Wilkinson, H., Minichiello, A., & Shaw, S. (June 2024). Developing an asset-based, orientation-style seminar for military and nontraditional students in engineering. *Invited presentation for the Military and Veterans Division at the 131st Annual ASEE Conference & Exposition,* Portland, OR.

This and the presentation at the CoNECD Conference focus on the development of an assets-based, orientation-style seminar for military and nontraditional students studying engineering. These presentations aim to increase awareness of current efforts and techniques to support military students among educational research scholars both within and outside of the military community.

5. Ongoing Work

As this CAREER project concludes Year 3 during the summer of 2024, the team will continue to recruit and generate data with engineering SVSM participants, as well as analyze data through narrative inquiry techniques as part of the research plan. The research team will also continue to conduct the systematic literature review related to U.S. military students in undergraduate engineering with plans to submit it for journal publication by the end of 2024.

Now that the groundwork data generation with institutional agents has concluded, we will continue our education plan work by iteratively and collaboratively working with stakeholders to develop the assets-based SVSM awareness training for faculty, staff, administration, and non-military students, and the seminar for SVSM and nontraditional undergraduate students in engineering. Additionally, we are developing an online community of institutional agents who support SVSM in our region for sharing ideas and resources. All of these products will be piloted at the PI's institution and then shared with both the regional military student support community and nationally.

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