



The Veteran Education to Workforce
Affinity and Success Study



JANUARY 2021

DATA REPORT

University of Wisconsin-Madison
Student Military Service Members
and Veterans: Phase One Research
Findings from the Veteran
Education to Workforce Affinity
and Success Study

**Dr. Ross J. Benbow
and Ms. Xin Xie**

Wisconsin Center for Education Research
University of Wisconsin-Madison

SUMMARY

This report contains findings from a research study focused on undergraduate student military service members and veterans (SSM/Vs) at the University of Wisconsin–Madison (UW–Madison). While these talented students are poised to expand and strengthen the twenty-first century workforce, research suggests that they face a number of social obstacles in college. The Veteran Education to Workforce Affinity and Success Study (VETWAYS), a three-year National Science Foundation-supported project (Project Number 1920482), therefore focuses on two objectives:

- (1) Better understand SSM/V social support networks—or relationships that provide assistance, advice, and camaraderie shown to help students succeed—as well as how these networks influence students as they move through college into careers.
- (2) Provide data-supported insights for student service professionals and other stakeholders that can help improve SSM/Vs' academic experiences and workforce outcomes.

During Phase One of this study, reported here, online surveys ($n=113$) and interviews ($n=14$) of SSM/Vs were administered at UW–Madison between February and May 2020. At the same time, additional surveys ($n=510$) and interviews ($n=40$) were also administered at UW–Green Bay, UW–Milwaukee, UW–Oshkosh, and UW–Stout. The survey and interview questions focused on students' demographics; high school and military experiences; university life; career plans; COVID-19, which forced all classes to go online in mid-March; and social support networks. Key findings on these themes from the UW–Madison sample are:

UW–Madison Sample Demographics

- The UW–Madison SSM/V survey sample is similar to the SSM/V population around the country. As compared with traditional students, the sample is predominantly male, older, more often married with children or dependents, and composed of more first-generation, transfer, and physically and cognitively impaired students.
- Compared with the wider survey sample of SSM/Vs participating in the other four peer institutions, the UW–Madison survey sample is significantly younger, less physically and cognitively impaired, less often first-generation, and has a different distribution of undergraduate majors that includes fewer business and finance majors, and more engineering and social science majors.

High School and Military Experiences

- In interviews, students said they decided to serve in part because family members or close friends had served and the service would provide college tuition and a new direction in life.
- About one third of the survey sample identified as discharged/retired veterans, nearly two thirds were reserve- and national guard-service members, and 5% were on active duty; 34% of the sample reported receiving combat pay during their military service.

University Life

- UW–Madison interviewees said “camaraderie” and “structure” were the two aspects of military life most missing from university life.
- On average, UW–Madison SSM/Vs reported a moderate sense of belonging on campus (3.3 on a 5-point scale) on surveys; students also reported moderate academic integration on campus, including social contact with faculty and other students (1.7 on a 3-point scale).
- Compared with SSM/Vs in peer universities, UW–Madison students are significantly more likely to feel an increased sense of campus belonging.

Career Plans

- A plurality of SSM/Vs in the survey sample plan to enter science and engineering careers; 67% said their college major was “closely” related to their planned career.
- SSM/Vs said that a work/life balance was their most important career consideration, while their career’s connection to their military occupation was their least important consideration.
- UW–Madison SSM/Vs are significantly less likely to think that their probable career/occupations will be closely related to their university majors compared with SSM/Vs in the other four universities.

COVID-19

- Large majorities of SSM/Vs across the universities said their internet and computer access and housing arrangements would be the *same or better* after pandemic-related university closures in March.
- Significant proportions of SSM/Vs, however, reported that they believed other aspects of their life would be *worse or much worse* after closures, including their access to food (23%), financial stability (37%) and access to childcare (38%).
- Importantly, 43% of SSM/Vs surveyed said they thought their level of social support would be worse or much worse due to campus closures in the spring of 2020.

Social Support Networks

- Research indicates that strong social support networks are linked to improved academic experiences for SSM/Vs. Our survey data on the social support networks of UW–Madison SSM/Vs show students had about 6 people in total with whom they discussed personal matters and academic/career issues. Students also reported on average less than 1 university educator and less than 1 fellow student in their social support networks.
- UW–Madison students’ academic/career networks are significantly larger than those of SSM/Vs from the other four universities in the study.

Connecting Student Attributes to Important Outcomes

- Statistical tests show that all else being equal, SSM/Vs with larger social support networks, comprised of more university educators and students, have a greater sense of campus belonging, higher academic integration, and use their college's veteran lounge more often.
- Students with closer relationships to members of their social support networks, however, have lower levels of academic integration and are less likely to hang out in their college's veteran lounge.

Recommendations

1. SSM/V-focused university orientation sessions for incoming SSM/Vs can help build social support networks and alleviate challenges students face as they enter the university.
2. Valuable connections to other SSM/Vs on campus can be facilitated through planned events, a veteran lounge area, and the support of SSM/V student organizations.
3. Encouraging SSM/Vs' connections to nonveteran students and educators, as well as "Green Zone" trainings locally, can improve SSM/V campus and community integration.
4. Following through on these recommendations will require increased funding and support for campus veteran service staff due to already-substantial demands related to certification of GI Bill and other education benefits.

Introduction and Background

Student military service members and veterans (SSM/Vs) are one of the fastest growing groups of nontraditional students in American colleges and universities (e.g., American Council on Education, 2014) in recent years. This development can both strengthen and diversify the American university and workforce. Aside from their advanced technical, problem-solving, and teamwork skills, SSM/Vs nationwide are proportionally older, more racially and ethnically diverse, and more often first-generation students from low-income backgrounds than traditional college students (Barry et al., 2012; NSSE, 2010).

Recent studies suggest student military service members or veteran (SSM/V) experiences improve with *strong social support networks*—relationships that provide students with assistance, advice, and camaraderie.

SSM/V enrollment expansion, however, comes with challenges. Transitions between military and civilian life, service-related impairments, alienation from students and staff, and the complicated bureaucratic maze associated with state and federal benefits all present SSM/V with difficulties that many postsecondary educators do not fully understand (DiRamio et al., 2008). These issues are especially relevant in Wisconsin, a state without a large military presence where service members and veterans have lower college graduation rates than peers nationally (VA, 2017).

Greater levels of SSM/V success are achievable. In particular, recent studies suggest that SSM/V experiences improve with *strong social support networks*—groups of relationships that provide assistance, advice, and camaraderie (Livingston et al., 2011; Rumann & Hamrick, 2010). However, little research has deeply investigated such networks nor how they could be a valuable leverage point for improving SSM/V outcomes. Further, despite calls for research that will follow these students over time to establish what factors predict success, little work has used a longitudinal approach to trace SSM/V social support and persistence along workforce pathways.

Purpose

The **Veteran Education to Workforce Affinity and Success Study (VETWAYS)** is a three-year National Science Foundation-funded research project focusing on these issues. Using two rounds of online surveys and interviews that follow SSM/Vs through University of Wisconsin (UW) System universities, the project explores the role social support plays in helping military-affiliated students finish college and enter gratifying careers. Our mission is twofold:

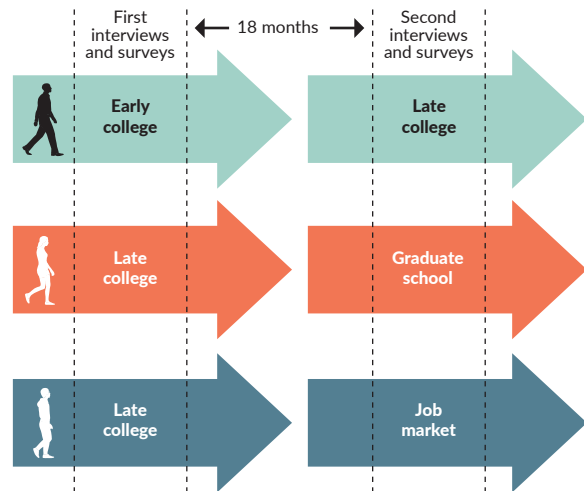
- (1) Better understand SSM/V social support networks as well as how these networks influence students as they move through college into careers, and
- (2) Provide data-supported insights for student service professionals, administrators, employers, and policymakers that strive to improve SSM/V academic experiences and workforce outcomes.

Methods

To meet these objectives, VETWAYS is conducting a mixed-methods study of SSM/Vs in five UW System universities chosen for their demographic and geographic diversity: UW–Green Bay, UW–Madison, UW–Milwaukee, UW–Oshkosh, and UW–Stout. A detailed description of our research methods is provided in Appendix I.

Through two study phases, the project follows undergraduate SSM/Vs in these institutions as they navigate different education-to-career pathways (Figure 1). During Phase One, reported here, the study team surveyed 623 SSM/Vs across all five universities. Online survey questions were designed to record SSM/V demographics, educational experiences, academic and career pathways, and social support network characteristics. The team also conducted semi-structured interviews over Zoom or Skype with a subset of 54 SSM/V volunteers. Interview questions were meant to explore student perspectives on career pathways and support networks during one-hour sessions with each student. Surveys and interviews were all conducted between February and May 2020. Phase Two of this study, which will follow up with these participants, will take place in fall 2021.

Figure 1. Three focal career pathways



In this initial report, we use descriptive and associative statistical methods as well as simple inductive coding to provide quantitative and qualitative findings from UW–Madison survey ($n=113$) and interview ($n=14$) responses. Please note that this study's survey sample is made up of volunteers and represents 49.6% of the total SSM/V undergraduate population at UW–Madison. Still, these data are useful to better understand SSM/V characteristics and behaviors that are usually not available in reports based on admissions, registrar, or financial aid information.

To provide broader context for institutional-specific findings as well as inform readers of results in the other four peer universities that were a part of this study, many descriptive UW–Madison data are reported side-by-side with combined data from the other four peer universities. When there are statistically significant differences between UW–Madison findings and the findings from the other four institutions, we note these contrasts, sometimes using asterisks and other times in notes under displayed figures.¹

During Phase One of this study, reported here, the study team surveyed 623 SSM/Vs at UW–Green Bay, UW–Madison, UW–Milwaukee, UW–Oshkosh, and UW–Stout. The team also conducted interviews with a subset of 54 of these SSM/V volunteers.

1 Asterisks represent the probability that the computed difference between the measures is due to a random occurrence: * equals a 5% chance the difference is random, ** equals a 1% chance, and *** equals a 0.1% chance. In Chi-squared (χ^2) and t-tests, while an asterisk represents a significant difference between two measures, more asterisks indicate a stronger probability that the difference is not due to chance.

Survey and interview findings are presented below according to eight thematic categories: UW–Madison Sample Demographics, High School and Military Experiences, University Life, Career Plans, COVID-19—which forced campuses to close and all classes to go online in March—Social Support Networks, Connecting Student Attributes to Important Outcomes, and Recommendations.

Findings

UW–Madison Sample Demographics

Surveys

One hundred thirteen undergraduate SSM/Vs at UW–Madison participated in the online survey, representing a 49.6% response rate. UW–Madison sample statistics and comparisons to the rest of the student sample are presented in Table 1. Please note that science, technology, engineering, mathematics, and medical (STEMM) majors are italicized.

Table 1. Survey sample of UW–Madison SSM/Vs (n=113) and other four universities (n=510)

Measure	UW–Madison		Other Four Universities	
	N	%	N	%
Gender				
Female	31	27.4	120	23.5
Male	80	70.8	386	75.7
Nonbinary	2	1.8	4	0.8
Race/Ethnicity ²				
American Indian or Alaska Native	2	1.8	18	3.5
Asian or Asian American	11	9.7	30	5.9
Black or African American	1	0.9	24	4.7
Hispanic or Latino	7	6.2	35	6.9
Native Hawaiian or Pacific Islander	0	0.0	8	1.6
White or Caucasian	96	85.0	439	86.1
<i>White Students</i>	92	81.4	412	80.8
<i>Students of Color</i>	21	18.6	96	18.8
Undergraduate Major ^{***}				
Arts and Humanities	12	10.6	36	7.1
<i>Biological and Life Science</i>	12	10.6	34	6.7

² “Students of Color” include students who identified as mixed race or as American Indian or Alaska Native, Asian or Asian American, Black or African American, Hispanic or Latino, or Native Hawaiian or Pacific Islander. “White Students” include students who only identified as White or Caucasian.

Measure	UW-Madison		Other Four Universities	
	N	%	N	%
Business	3	2.7	52	10.2
Education	2	1.8	30	5.9
Engineering	18	15.9	59	11.6
Finance	7	6.2	78	15.3
Health	14	12.4	62	12.2
Math and Computer Science	9	8.0	38	7.5
Physical Science	8	7.1	5	1.0
Social Science	20	17.7	54	10.6
Other	6	5.3	56	11.0
Undeclared	2	1.8	6	1.2
Service Status***				
Discharged or Retired Veteran	36	31.9	306	60.0
On Active Duty	6	5.3	9	1.8
In Reserves or National Guard	71	62.8	195	38.2
First Generation Students ^{3***}	21	18.6	184	36.1
Disability Status				
Cognitive Impairment	7	6.2	53	10.4
Mobility Impairment	4	3.5	66	12.9
Sensory Impairment	3	2.7	33	6.5
Impaired Students***	11	9.7	115	22.5
Mean Age***	25.2 (SD ⁴ = 5.0)		30.5 (SD = 9.7)	

Note. The distributions of several variables are significantly different between UW-Madison SSM/Vs and SSM/Vs from the other four universities, including undergraduate major ($p < .001$), service status ($p < .001$), first-generation status ($p < .001$), impairment ($p < .001$), and age ($p < .001$).

3 "First Generation" students are students reporting that their parental guardians have not obtained an associate's level college degree or above.

4 Standard deviation (SD) is a measure of the amount of variation within a set of values. A low SD indicates that the values tend to be clustered closer to their mean. A high SD indicates that the values are spread out more widely.

Notable findings from the UW–Madison survey sample:

- The UW–Madison SSM/V survey sample is similar to the SSM/V population around the country as a whole. Compared with traditional students, the sample is predominantly male (71%); older (a mean age of 25); more often married (15%) with children or dependents (9%); and composed of more first generation (19%), transfer (43%), and physically and cognitively impaired students (10%).
- Unlike the national SSM/V population, this sample is not composed of a higher percentage of students of color than the traditional college student population. Instead, students of color make up a similar percentage of the UW–Madison SSM/V sample (19%) as they do the student population of the university as a whole (18%).
- A plurality of UW–Madison SSM/Vs in the sample (18%) are in a social science major; 16% are in an engineering major, and 12% are in a health major.
- About 72% of UW–Madison SSM/Vs are in STEMM majors.
- Asterisks by a UW–Madison figure show that there is a statistically significant difference between the UW–Madison sample and the study’s wider sample in that category. Here, the UW–Madison sample has a significantly different distribution of undergraduate majors, with fewer business and finance majors and more engineering and social science. The sample is proportionately less made up of discharged and retired veterans, and is significantly less often first-generation, less impaired, and younger than the wider sample of SSM/Vs participating in the four peer institutions

Compared with traditional students, the UW–Madison sample is predominantly male, older, more often married with children or dependents, and composed of more first generation, transfer, and physically and cognitively impaired students.

Interviews

Fourteen UW–Madison SSM/Vs were interviewed for this study, all STEMM majors who completed the online survey. UW–Madison interview sample statistics are presented in Table 2.

Table 2. UW–Madison interview sample (n=14)

Measure	N	%
Gender		
Female	4	28.6
Male	9	64.3
Nonbinary	1	7.1
Race/Ethnicity		
American Indian or Alaska Native	2	14.3
Asian or Asian American	0	0
Black or African American	0	0
Hispanic or Latino	1	7.1
Native Hawaiian or Pacific Islander	0	0
White or Caucasian	11	78.6
<i>White Students</i>	11	78.6
<i>Students of Color</i>	3	21.4
Undergraduate Major		
Biological and Life Sciences	2	14.3
Engineering	4	28.6
Health	1	7.1
Math and Computer Science	4	28.6
Physical Science	3	21.4
Service Status		
Discharged or Retired Veteran	8	57.1
In Reserves or National Guard	6	42.9
First Generation Students	3	21.4
Disability Status		
Cognitive Impairment	2	14.3
Mobility Impairment	1	7.1
Sensory Impairment	1	7.1
<i>Impaired Students</i>	3	21.4
Mean Age	28.4 (SD = 6.97)	

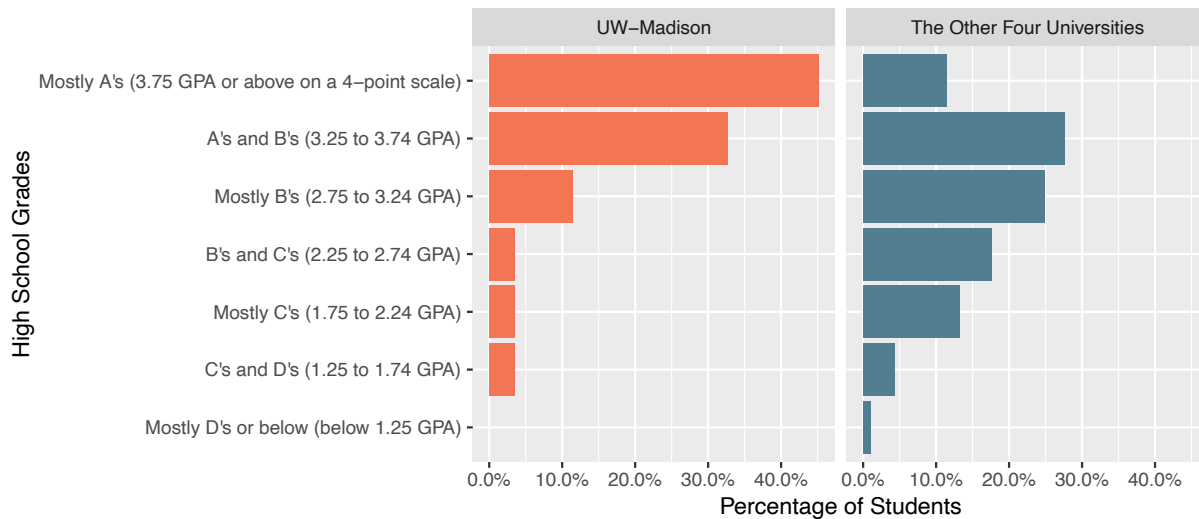
High School and Military Experiences

Several questions on the online survey and in the interviews asked students about their high school and military experiences as well as their transitions into and out of formal education. Here, we present findings on SSM/V high school grade point averages (GPA), reasons for entering the military after high school, time in the service and between high school and college, military service status, and military occupational specialties.

High School

High school grades are often a reliable indicator of students' success in college. When UW–Madison students were asked on the survey about their GPA during high school, the majority reported receiving A's and B's (a 3.25 GPA or above on a 4-point scale). This is higher, at a statistically significant level, than the grades of SSM/V respondents from the other four peer institutions in the study (Figure 2).

Figure 2. Survey-reported high school grades of SSM/Vs in UW–Madison (n=113) and peer universities (n=510)

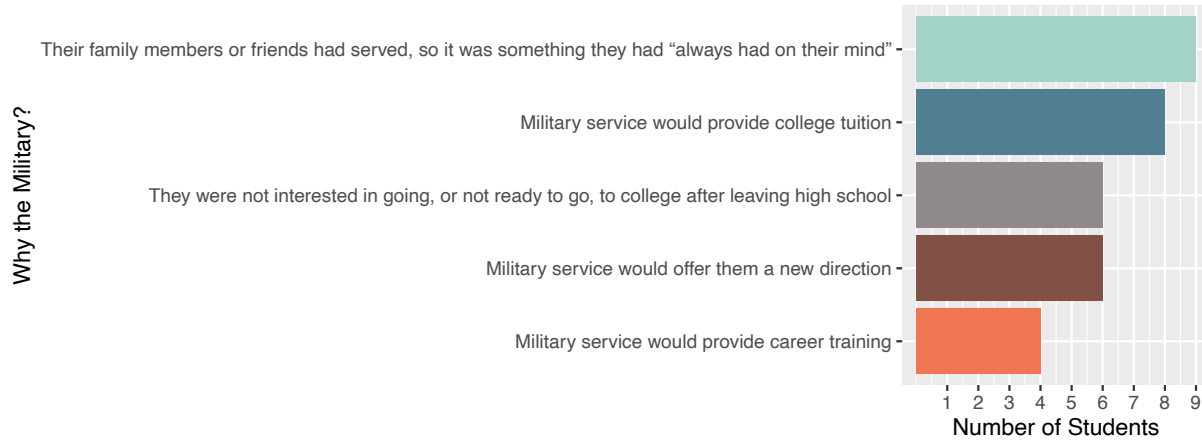


Note. The distribution of high school grades is significantly different between UW–Madison SSM/Vs and SSM/Vs from the other four universities ($p < .001$).

Why the Military?

During student interviews, we asked each UW–Madison interviewee why they decided to enter the service, typically after high school. Interviewees told us that it was a combination of factors, including that family or friends had served and the military service would provide college tuition. Results are displayed in Figure 3.

Figure 3. Interview-reported reasons for entering the military among UW–Madison SSM/Vs (n=14)



Students speaking to new directions, for instance, usually told us they saw military service as a special opportunity to change their lives and do something different. One UW–Madison student explained:

I didn't really know what I wanted to do with my life. I was working at a dead-end job, I knew that I didn't really want to do that, and I liked the idea of the military. Just an adventure, just something different, just something where I have some sort of direction. ... I mean what other option at 18 years old do you have for that?

"Just an adventure, something different, something where I have some sort of direction." -UW-Madison student

Military Transitions

About 70% of U.S. college-bound high school graduates enroll in college a few months after graduation (NCES, 2020). In Table 3, we see that members of the UW–Madison SSM/V survey sample have on average 4.5 years of military service, with an average of 3.8 years between high school graduation and college enrollment. UW–Madison survey respondents also on average had -1.6 years between military discharge or retirement and college enrollment, meaning that the majority started college when they were still serving. UW–Madison students had significantly fewer years between high school graduation and college enrollment, as well as between military discharge/retirement and college, compared with students in the four peer institutions.

Table 3. Survey-reported mean number of years in military service and to college enrollment of SSM/Vs at UW–Madison and peer universities

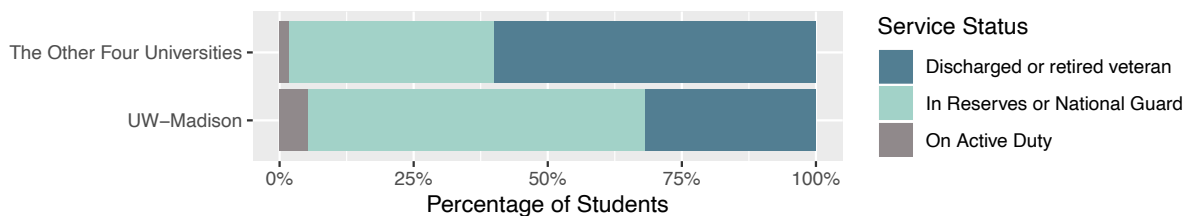
	UW–Madison		Other Four Universities	
	Mean Score	N	Mean Score	N
Years of military service	4.5 (SD = 2.8)	111	5.1 (SD = 2.9)	431
Years between high school graduation and starting college***	3.8 (SD = 4.7)	110	7.5 (SD = 6.7)	453
Years between military discharge and starting college***	-1.6 (SD = 3.0)	110	0.8 (SD = 4.5)	454

Note: Students who served in the military before the year 2001, graduated from high school before 1990, and started college before 2010 are not included in this analysis. SSM/V years between high school graduation and college, along with years between and military discharge and college, are significantly different between UW-Madison SSM/Vs and SSM/Vs from the four other universities ($p < .001$).

Military Service

Thirty-two percent of the UW–Madison survey sample identified as discharged/retired veterans, 63% were reserve- or national guard-service members, and 5% were on active duty when they took the online survey. The UW–Madison SSM/V sample is comprised of a significantly higher proportion of reserve- and national guard-service members than the other four institutions in this study (Figure 4).

Figure 4. Survey-reported service status of SSM/Vs in UW–Madison and peer universities



Note. SSM/V service status is significantly different between UW–Madison SSM/Vs and SSM/Vs from the four other universities ($p < .001$).

Thirty-four percent of the UW–Madison survey sample reported receiving *combat pay*—defined as income earned while stationed in a designated combat zone—at some point during their military service. While the proportion of UW–Madison students receiving combat pay is smaller compared with the other four universities, there is no significant difference in this regard between UW–Madison and the other four universities (Figure 5).

On the survey, students reported working various military occupations while in the service. A plurality of UW-Madison students (27%) reported a combat specialty as their primary occupational group during their military service. There is no significant difference in the distribution of UW-Madison SSM/Vs' military occupations compared with that of SSM/Vs in the other four universities (Figure 6).

Figure 5. Survey-reported combat pay of SSM/Vs in UW-Madison and peer universities

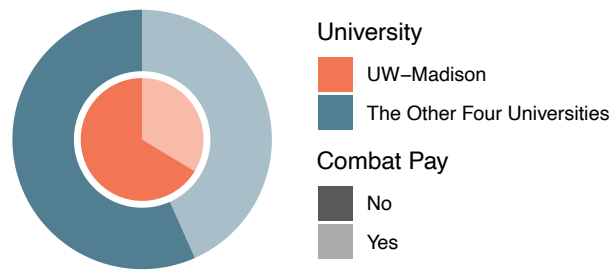
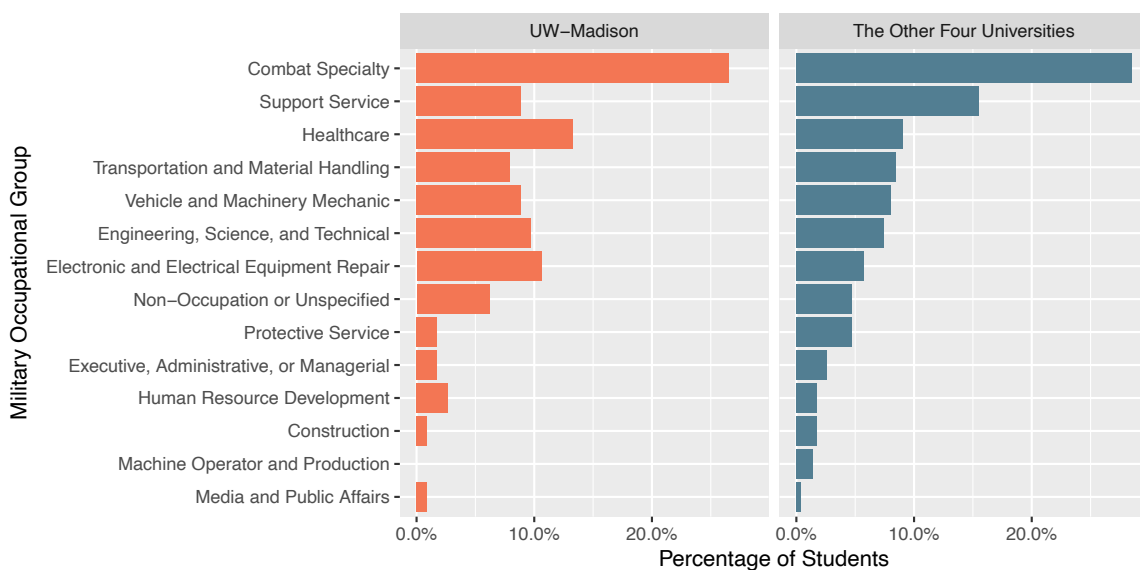


Figure 6. Survey-reported military occupations of SSM/Vs in UW-Madison and peer universities



University Life

Other survey and interview questions asked students about their university experiences, including the transition between college and military life, their student enrollment status and first-year grades, their academic integration, and their feelings of campus belonging.

Military to University

To better understand transitions into university from the military, student interviewees were asked to list specific facets of military life that they thought were missing from UW-Madison. Results, which display and compare the top 5 terms listed by SSM/Vs from UW-Madison and the other four universities in this study, are displayed in Table 4. Interview and analysis methods are described in more detail in Appendix I.

Table 4. Interview-reported aspects of military culture missing from UW–Madison (n=14) and other universities (n=40)

UW–Madison			Other four universities		
Term	N	%	Term	N	%
Camaraderie	12	85.7	Camaraderie	21	52.5
Structure	8	57.1	Structure	17	42.5
Common purpose	4	28.6	Self-discipline	12	30.0
Standardization	4	28.6	Respect	12	30.0
Accountability	4	28.6	Accountability	11	27.5

In Figure 7, we see a “word cloud” of the aspects of military life UW–Madison interviewees said were missing from university in this exercise. The more students who mentioned a term, the larger that term appears in the diagram.

In particular, interview results show that students perceive an absence of *camaraderie* and *structure* in university life (see Benbow, 2020). With *camaraderie*, students said the missing family atmosphere, trust, and deeper relationships of their military experience were an important influence on their university experience. One UW–Madison student explained it this way:

In the military everyone just kind of comes together and they just understand, you just look at them and you think, ‘They get it.’ You can always tell when you’re in a room with another person who has served just by the way they interact...I’m not saying that there’s no camaraderie on campus. I just think it’s a different kind. There’s a lot of groups of people in college, and they kind of naturally separate from one another.

The comparative lack of structure in university life, where myriad decisions both big and small are left to students, could also make for a difficult transition. As another UW–Madison interviewee told us,

At first it was exciting to have a lot of freedom at college. But at the same time it’s bewildering and a little bit weird to have so much freedom in your coursework or when you do your homework or how you do things. It’s strange not having so many specifics.

Figure 7. Interview-reported word cloud of aspects of military culture missing from UW–Madison



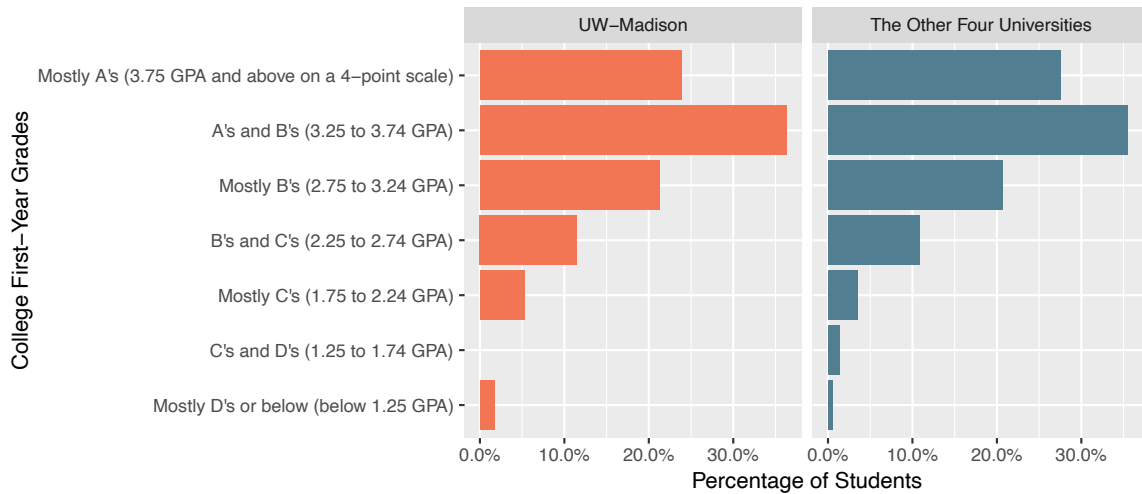
“I’m not saying that there’s no camaraderie on campus. I just think it’s a different kind.” -UW-Madison student

University Experiences and Behavior

UW–Madison survey participants reported a number of other specifics about university.

First-year GPA. Studies suggest students' first-year college grades associate with their persistence to a degree (e.g., Crisp et al., 2009). Here, the majority of UW–Madison survey participants reported receiving mostly A's (3.75 GPA or higher) or A's and B's during their first full year at UW–Madison. The distribution of UW–Madison SSM/V first-year GPA in college is not significantly different from those of their peers in the other four UW universities (Figure 8).

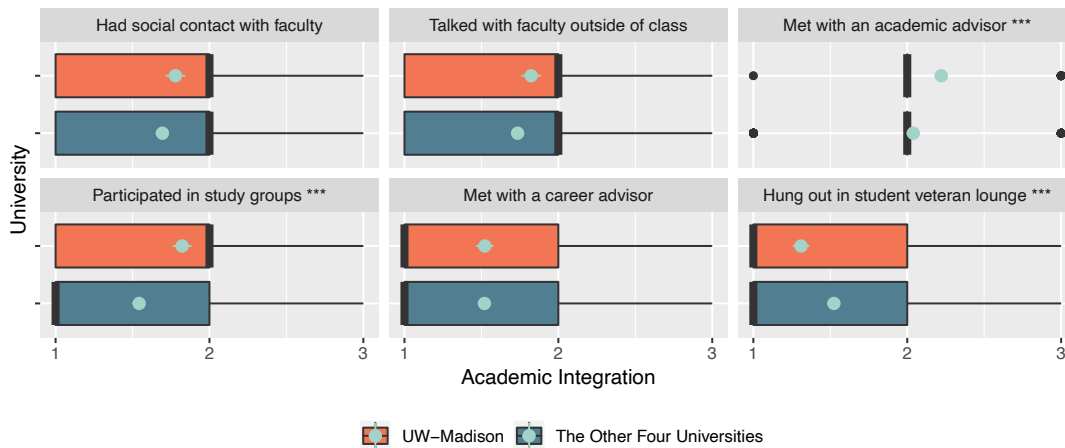
Figure 8. Survey-reported first-year college grades of SSM/Vs in UW–Madison and peer universities



Academic integration. “Academic integration,” including social contact with faculty, participation in student study groups, and meetings with academic and career counselors, has been shown to be an important indicator of student academic engagement and, ultimately, college persistence (e.g., Pascarella & Terenzini, 1991). Our survey asked students to report on how often they engaged in these activities as well as how often they hung out at the UW–Madison student veteran lounge, an important facet of SSM/V life.

Overall, UW–Madison SSM/Vs reported moderate academic integration on campus (1.7 on a 3-point scale). UW–Madison students show significantly more academic integration in meeting with academic advisors and participating in study groups, but less academic integration in hanging out in the student veteran lounge, than students at the other four universities. Results for each academic integration item are displayed in Figure 9.

Figure 9. Survey-reported academic integration of SSM/Vs in UW–Madison and peer universities

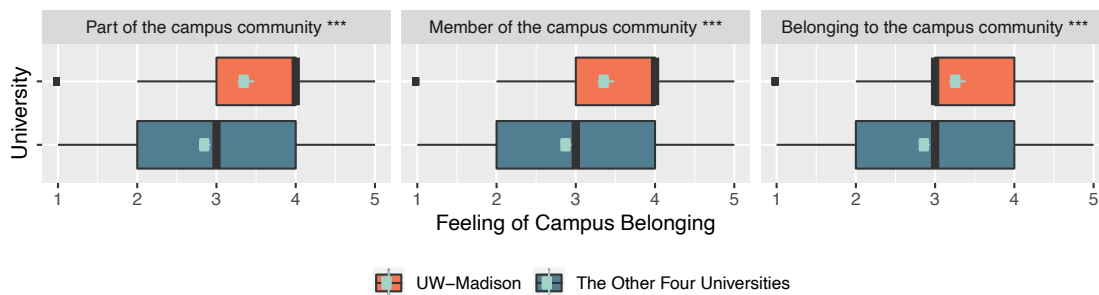


Note. Academic integration is significantly different between UW–Madison SSM/Vs and SSM/Vs from the other four universities in regard to meeting with an academic advisor ($p < .001$), participating in study groups ($p < .001$), and hanging out in the student veteran lounge ($p < .001$). The light green dots indicate the means and the thick black lines indicate the medians for each sample (1 = “Never,” 2 = “Sometimes,” 3 = “Often”).

Feelings of campus belonging. It is well established that a student’s sense of campus belonging—the feeling that they see themselves as a member of their campus community—is important to college success (Hurtado & Carter, 1997). On average, UW–Madison SSM/Vs reported a moderate sense of belonging on campus (3.3 on a 5-point scale). Ultimately, members of the UW–Madison survey sample reported significantly greater feelings of campus belonging compared with their peers in the other four universities. UW–Madison students are significantly more likely to see themselves as part of the campus community, feel that they are members of the campus community, and feel a sense of belonging to the campus community (Figure 10).

On average, UW–Madison SSM/Vs reported moderate academic integration (1.7 on a 3-point scale) and a moderate sense of belonging on campus (3.3 on a 5-point scale).

Figure 10. Survey-reported SSM/V feeling of campus belonging in UW–Madison and peer universities



Note. Feelings of campus belonging are significantly different between UW–Madison SSM/Vs and SSM/Vs from the other four universities in regard to an overall sense of belonging ($p < .001$), feeling part of the campus community ($p < .001$), feeling like a member of the campus community ($p < .001$), and feeling a sense of belonging to the campus community ($p < .001$). The light green dots indicate the means and the thick black lines indicate the medians (1 = “Strongly disagree,” 2 = “Disagree,” 3 = “Neither agree nor disagree,” 4 = “Agree,” 5 = “Strongly agree”).

In interviews, we also asked students to explain what aspects of their college experiences influenced their sense of belonging as well (see Benbow & Lee, 2020). UW–Madison students brought up several factors, displayed in Table 5.

Table 5. Interview-reported factors influencing campus belonging for UW–Madison students

Theme	N	Description
Familiar faces	6	A feeling of positively recognizing, and/or being recognized by, other members of the campus community
Timing	5	Time as a social support factor, either regarding how long one has been at the university, or missing classes or semesters because of military responsibilities
Student friendships	5	Close relationships with other university students offering a connection to the social and academic life of their university through companionship, study partnerships, and/or the opportunity to relax
Campus involvement	4	Clubs, work, or other extracurricular involvement taking place on campus
Veteran support	3	Perceived university encouragement, inclusion, and advocacy specifically for SSM/Vs at the university, communicated through policies and/or service member and veteran-specific support staff
Faculty care	2	Expressed attention, concern, guidance, interest, and/or empathy from university instructors (not including support from veteran coordinators)
Academics	1	Broader teaching and learning approach in student program or institution (e.g., hands-on, theoretical), which may or may not make SSM/Vs feel like they fit in
Home/ heritage	1	University has been a social focus for years, through athletic fandom, proximity to home, and/or family member alumni status

Note: Themes are listed from top to bottom by number of interviewees mentioning each theme.

Across these interviews, SSM/Vs indicated that their sense of belonging was affected by whether or not they had developed *student friendships* on campus; previous research corroborates this idea (Heller et al., 2011). Interviewees said such friendships offered a direct connection to the social and academic life of their university as well as camaraderie, study partnerships, and the opportunity to relax. One UW–Madison student told us, for instance, that not having close student friendships and, by extension, not belonging, was part of being a commuter of a different age.

“For a lot of my commuting peers, we go to school and that’s our job. Then, we go home. If we lived on campus we’d probably be hanging out with friends, drinking beers, doing homework all the time together.” – UW–Madison student

Not living on campus, being older, it leads to feeling like you're the odd person out. Socially, I wouldn't say I really feel that big of a part of the school. For a lot of my [commuting] peers, we go to school and that's our job. Then, we go home. Whereas if we lived on campus, well, we'd probably be hanging out with friends, drinking beers, doing homework all the time together.

Interviewees across the study also told us that their university's perceived *veteran support* was important to their sense of belonging. Tangible, positive interactions with university systems or personnel, in this regard, could explain the difference between SSM/Vs who felt socially supported on campus and those who did not. For example, another UW–Madison student said,

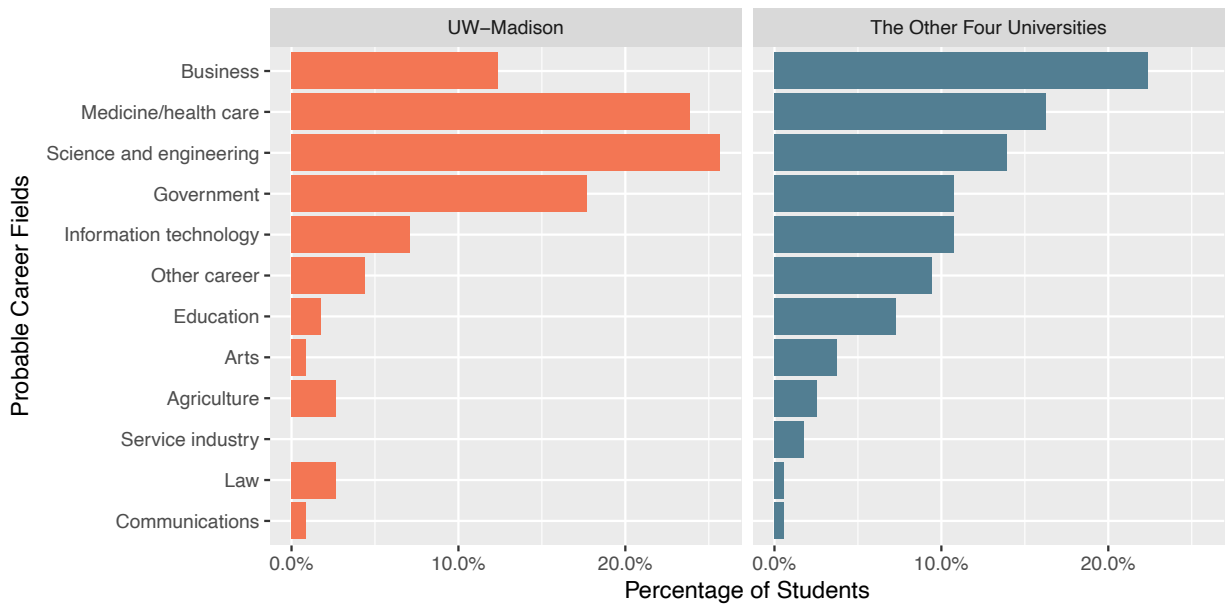
There's been a lot of improvement in the past few years with UW–Madison reaching out to vets. I know that the veteran coordinator has been doing a lot of work in trying to reach veterans that don't really want to identify with the macho, grow out a big beard, wear grunt-style T-shirts every day, and I think that's awesome.

Career Plans

VETWAYS is designed, in part, to understand how student social and academic experiences in college influence SSM/V career trajectories. Several questions on the online survey asked students to report on their career plans and considerations. Notable findings include:

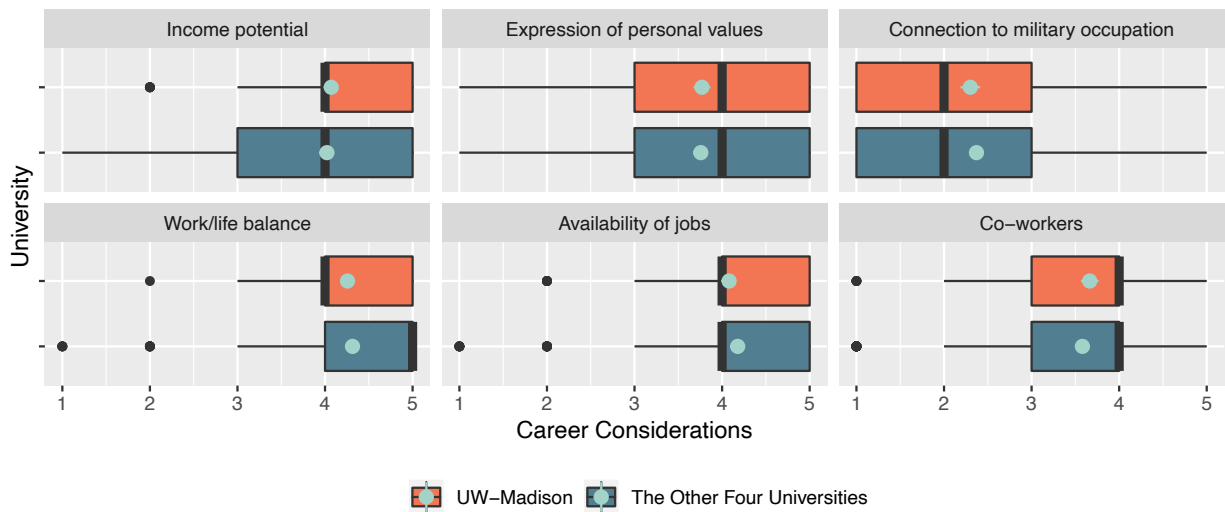
- A plurality of SSM/Vs in the sample (26%) plan to enter science and engineering careers, 24% plan to have medical/health care careers, while 18% plan to have government occupations (Figure 11).
- The distribution of probable career fields of UW–Madison SSM/Vs is significantly different from that of SSM/Vs in the other four UW universities.
- When asked about the importance of several different career considerations on a 1 to 5-point scale, UW–Madison SSM/Vs said work/life balance was of primary importance (4.3), followed by the availability of jobs (4.1), income potential (4.1), and the expression of personal values (3.8); SSM/Vs said their career's connection to their military occupation was least important (2.3) (Figure 12).
- UW–Madison SSM/Vs' career considerations are not significantly different from those of their peers in the other four UW universities.
- Though a majority of UW–Madison SSM/Vs (67%) said their university majors were closely related to their planned careers, UW–Madison SSM/Vs are still significantly less likely to think that their probable career/occupations will be closely related to their university majors compared with SSM/Vs in the other four UW universities (Figure 13).

Figure 11. Survey-reported probable career fields of SSM/Vs in UW–Madison and peer universities



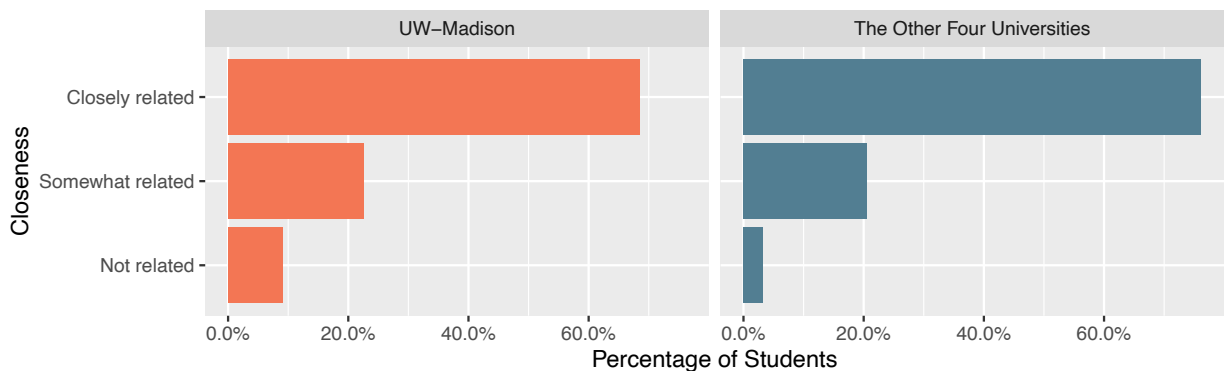
Note. The distribution of probable career fields is significantly different between UW–Madison SSM/Vs and SSM/Vs from the other four universities ($p < .001$).

Figure 12. Survey-reported career considerations of SSM/Vs in UW–Madison and peer universities



Note. The light green dots indicate the means and the thick black lines indicate the medians (1 = “Not at all important,” 2 = “Of little importance,” 3 = “Moderately important,” 4 = “Important,” 5 = “Very important”).

Figure 13. Survey-reported closeness between major and planned career of SSM/Vs in UW–Madison and peer universities

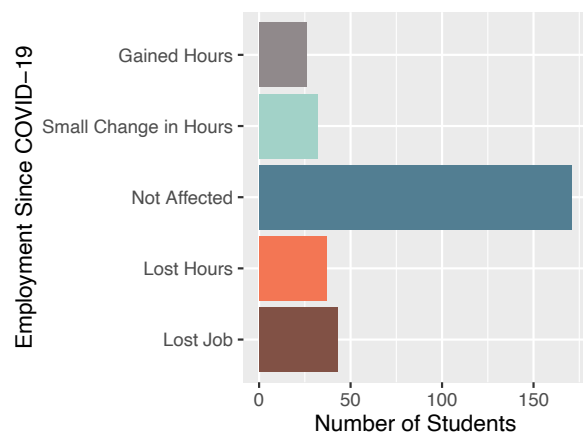


Note. The closeness of one’s major to one’s planned career is significantly different between UW–Madison SSM/Vs and SSM/Vs from the other four universities ($p < .05$).

COVID-19

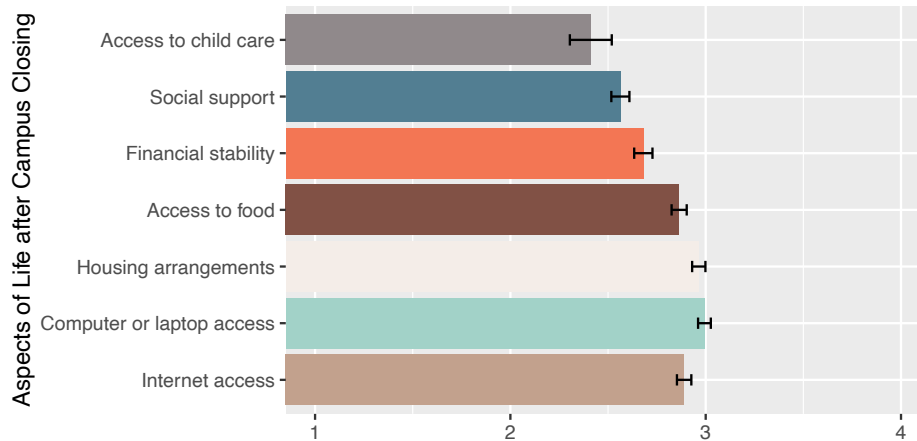
As the online survey for this study was being distributed in March 2020, classes across UW System university campuses unexpectedly closed and classes went fully online due to the COVID-19 pandemic. In response, VETWAYS added two sets of questions to the survey, one set asking about student employment changes and one asking students how they believed certain aspects of their life would change—specifically whether they would be much better, better, about the same, worse, or much worse—due to the campus closures and new virtual educational environment. Figures 14 and 15 display results for all SSM/Vs who completed COVID-19 survey questions ($n=309$).⁵

Figure 14. Survey-reported COVID-19 impact on SSM/V employment



⁵ Because of the timing of survey administration in the spring of 2020, less than half of the student sample from the five universities received COVID-19 survey items. No UW–Oshkosh students received these survey items.

Figure 15. Survey-reported SSM/V feelings on aspects of life after COVID-19 campus closures



Note. Lines indicate the standard deviation of student responses from the mean (1 = “Much worse,” 2 = “Worse,” 3 = “About the same,” 4 = “Better,” 5 = “Much better”).

Results suggest several themes:

- Forty-five percent of SSM/Vs who had employment when they took the survey said campus closures affected their jobs; 14% reported losing their jobs and 12% reported losing hours, while 8% of students reported gaining hours.
- Large majorities of students said their internet access (82%), computer or laptop access (92%), and housing arrangements (88%)—aspects of college life reported nationwide to be adversely affected by the closures—would be about the same or better.
- Significant proportions of SSM/Vs, however, reported that other aspects of their life would be worse or much worse, including access to food (23%) and financial stability (37%).
- Importantly for this study, 43% of SSM/Vs surveyed said they thought their level of social support would be worse or much worse due to campus closures.
- Thirty-eight percent of students with children/dependents said in answer to these questions that they thought their access to childcare would be worse or much worse, while 59% said they thought it would be about the same.

Social Support Networks

The most important goal of VETWAYS is to better understand SSM/V *social support networks*—or the relationship circles around students that provide assistance, advice, and camaraderie shown to help students succeed academically (e.g., Livingston et al., 2011). With this in mind, here we present survey-based data on the characteristics of SSM/V social support networks.

We study these groups of important relationships using “social network analysis,” a set of research methods that ask participants to list important people they talk to about specific topics, then to provide information on the listed people and relationships (Wasserman & Faust, 1994). Researchers then study the relationship characteristics to see how they might influence participants’ attitudes, decisions, or behavior.

The social support network data that come from these kinds of questions are often represented in diagrams mapping the survey participant (called the “ego”) and their contacts (“alters”) as nodes. The listed relationships between the ego and their alters as well as among the alters are represented as lines between the nodes (Figure 16).

Social support, both on- and off-campus, has been shown to be important to SSM/Vs (e.g., Griffin & Gilbert, 2015; Romero et al., 2015). We presented students with two online survey questions asking them to provide data about alters they talked to about (1) personal matters, as well as alters they talked to about (2) academic/career-oriented matters. Further survey questions asked SSM/Vs to describe their relationships with alters, alter characteristics, as well as alter relationships with other alters.

SSM/V responses, in turn, allowed us to develop a profile of each student’s social support network that included the number of alters with whom each participant discussed personal and academic/career matters; the role or position each alter played in the participant’s life; how close the participant felt to each alter; the highest academic degree each alter had obtained; and which other people in the network, if any, each alter knew (Figure 17).

Figure 16. Example social support network diagram

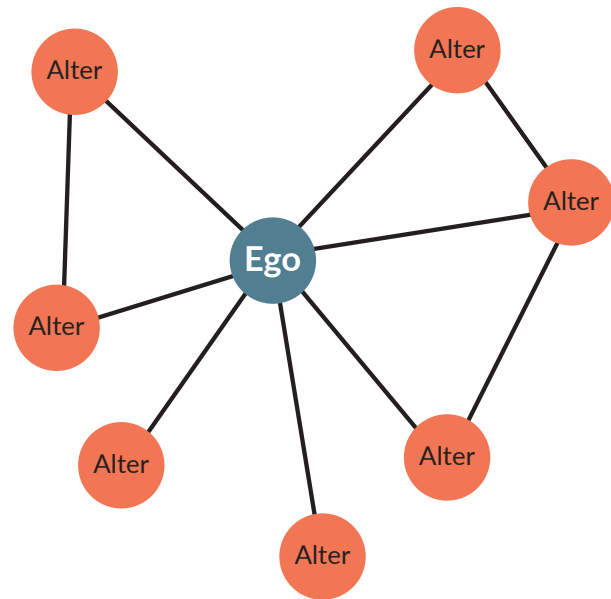
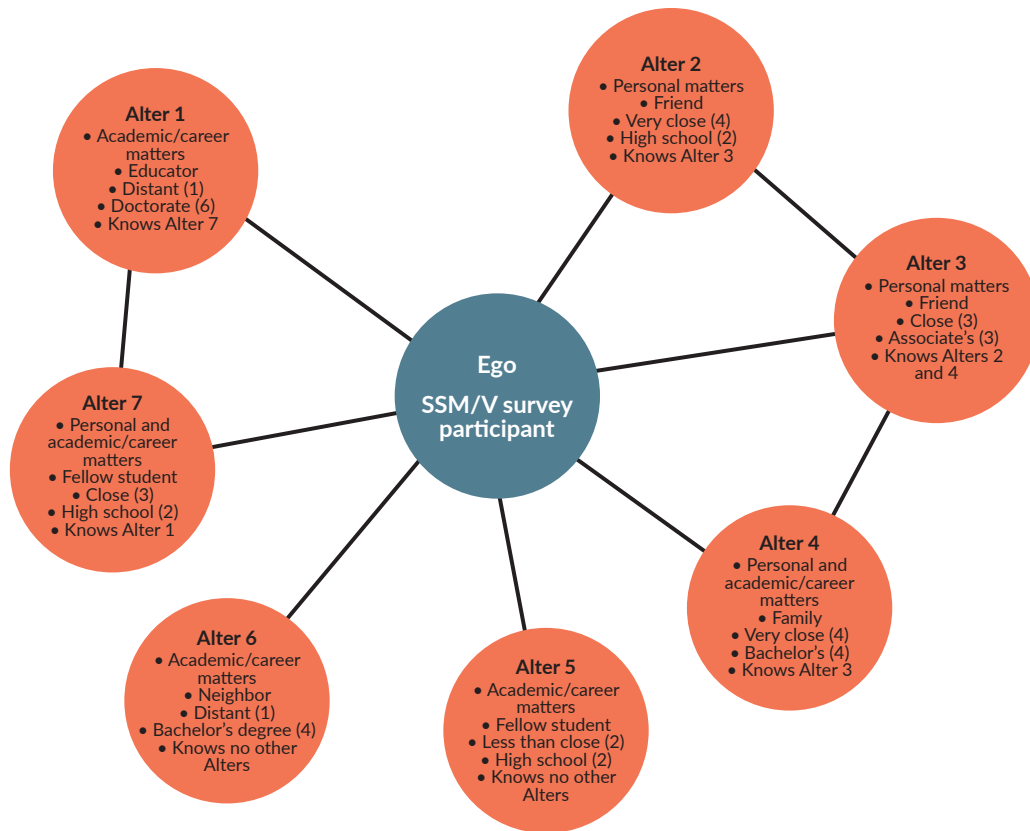


Figure 17. Example SSM/V social support network with relationship and alter characteristics



We then used these data to create eight measures of each SSM/V survey participant's social support network. These measures, which have been shown to be important in past studies of other student and non-student populations (Perry et al., 2018), include:

Network size = total number of alters in each student's personal matters network, academic/career network, and personal matters and academic/career network combined

Educator percentage = proportion of all network alters who are college faculty or staff

Fellow student percentage = proportion of all network alters who are fellow college students

Tie strength = average strength of relationship between ego and all alters on a scale from 1 (Distant) to 4 (Very close)

Highest degree = Average highest educational level among listed alters with 1=Less than high school, 2=High school, 3=Associate's degree, 4=Bachelor's degree, 5=Master's or professional degree, and 6=Doctoral degree

Effective size = number of different "pots" or unique sources of social support in network, equaling the average number of ties among alters subtracted from the network size

Table 6 describes these eight social support network measures for UW–Madison survey participants as well as for students from the other four universities.

Table 6. Survey-reported SSM/V social support network measures for UW–Madison and peer universities

Social Support Network Measure	UW–Madison	Other Four Universities
Personal matters network size	4.06 (SD = 1.45)	3.84 (SD = 1.55)
Academic/career network size*	5.05 (SD = 2.96)	4.39 (SD = 2.88)
Combined network size	5.69 (SD = 2.77)	5.21 (SD = 2.76)
Educator percentage	6.57 (SD = 15.25)	7.49 (SD = 19.29)
Fellow student percentage	6.88 (SD = 15.16)	5.62 (SD = 13.90)
Tie strength	3.31 (SD = 0.45)	3.21 (SD = 0.54)
Highest degrees among alters	3.24 (SD = 0.81)	5.69 (SD = 0.81)
Effective size*	4.77 (SD = 2.22)	4.18 (SD = 2.13)

Note: UW–Madison SSM/Vs and SSM/Vs from the four other universities have significantly different sized academic/career networks as well as combined networks of significantly different effective sizes ($p < .05$).

Initial results on SSM/V social support networks reveal several findings:

- UW–Madison students listed an average of 4 people with whom they discussed personal matters, 5 people with whom they discussed academic/career matters, and 6 people in total in their combined social support networks.
- UW–Madison SSM/V on average have fewer than 1 educator and 1 fellow student in their combined networks
- UW–Madison students reported an average tie strength of 3.3 with network alters, signifying that participants on average felt “close” to their listed personal and academic/career alters.
- The average highest degree level among UW–Madison SSM/Vs’ alters was between an Associate’s and a Bachelor’s degree.
- Findings indicate few significant social support network differences between UW–Madison students and students at the other four peer universities for these measures, though UW–Madison students’ networks have significantly larger academic/career networks as well as significantly higher effective size than networks of SSM/Vs from the other four universities.

Connecting Student Attributes to Important Outcomes

Though the data presented above represent only the first stage of the VETWAYS longitudinal research process, we can still use initial data to calculate whether differences in various student attributes connect or not to important outcomes.

Using regression analyses, here we test how different survey-based attributes of SSM/Vs across all five universities in this study ($n=623$) relate specifically to students' (1) sense of campus belonging, (2) academic integration, (3) likelihood of hanging out in their campus veterans' lounge, (4) sense of social support through the COVID-19 pandemic ($n=309$), and (5) important social support network characteristics.⁶ All significant findings between measures are displayed in Tables 7 and 8. Full regression results are displayed in Appendix II.

First, Table 7 shows the relationships between several SSM/V characteristics and students' campus belonging, academic integration, use of their campus veteran lounge, and sense of social support during the COVID-19 pandemic.

Table 7. Significant regression results on SSM/V individual and institutional characteristics

Outcome	Significant Results
Belonging	<ul style="list-style-type: none"> All else being equal, higher enrollment levels (**) and more dependents (*) significantly associate with a lower sense of campus belonging. Compared with UW–Green Bay SSM/Vs, who are used as the reference group, UW–Madison SSM/Vs reported a significantly higher sense of campus belonging (*).
Academic integration	<ul style="list-style-type: none"> White SSM/Vs reported significantly lower levels of academic integration than SSM/Vs who identified as students of color (*).
Veteran lounge use	<ul style="list-style-type: none"> Older students are significantly more likely to hang out in their college's student veteran lounge, while SSM/Vs with higher enrollment levels and more dependents are significantly less likely to do so (*). Compared with UW–Green Bay SSM/Vs, UW–Madison (**) and UW–Stout (**) SSM/Vs are significantly less likely to hang out in their college student veteran lounges.
COVID-19 social support	<ul style="list-style-type: none"> Compared with UW–Green Bay SSM/Vs, UW–Madison (***) and UW–Milwaukee (*) SSM/Vs were significantly more likely to feel that their social support would be negatively impacted by COVID-19 campus closures.

Note: UW–Oshkosh SSM/Vs did not participate in the COVID-19 section of the survey. P values for significant relationships are displayed in attendant parentheses. * $p < .05$; ** $p < .01$; *** $p < .001$

⁶ Regression analyses mathematically estimate the statistical relationship or lack thereof between participant measures. When testing finds that changes in one measure across participants—high school GPA, for instance—predict an increase or decrease of another measure across participants—college GPA, to use another example—the measures are said to be “significantly correlated” with one another if it is mathematically determined that there is a low probability (usually 5% or less) the association is due to chance. Multiple regressions, which we use here, allow one to test the combined association of multiple measures on an outcome variable.

We next tested the association of each of the SSM/V social support network measures from surveys with these same outcomes. Gender, race/ethnicity, age, high school GPA, enrollment level, dependent status, combat experience, first-generation status, and institution are controlled in these regression models.

Table 8. Regression results on SSM/V social support network characteristics

Outcome	Significant Results
Belonging	<ul style="list-style-type: none"> • All else being equal, having a larger personal matters network (**), larger academic/career network (***), and larger combined network (***) predicts a greater sense of campus belonging among SSM/Vs. • Having a higher percentage of educators (***) and fellow students (**) in one’s network also positively predicts a sense of belonging. • Effective size, which measures the number of unique “pots” of social support to which students are connected through their combined networks, is also found to be positively associated with SSM/Vs’ sense of belonging (**).
Academic integration	<ul style="list-style-type: none"> • SSM/Vs with larger networks (***), higher percentages of educators (***) and fellow students (**), and networks with larger effective sizes (***) have higher levels of academic integration. • SSM/Vs with alters with higher levels of education reported higher levels of academic integration (**). • On the other hand, higher tie strength, which refers to how close one feels to their network alters, predicts lower levels of academic integration (**).
Veteran lounge use	<ul style="list-style-type: none"> • SSM/Vs with larger networks (**), higher percentages of educators (***) and fellow students (**) in their networks, alters with more education (*), and higher effective size networks (*) are more likely to hang out in their college’s student veteran lounge. • Students with stronger network ties, however, are less likely to hang out in their college’s veteran lounge (***).
COVID-19 social support	<ul style="list-style-type: none"> • SSM/Vs with greater proportions of fellow students in their networks thought COVID-19 closures would be more negative than those with lower proportions of fellow students (**). • Students with higher tie strength were more likely to report that their lives would be better after COVID-19 forced their campuses to close (**).

Note: UW–Oshkosh SSM/Vs did not participate in the COVID-19 section of the survey. P values for significant relationships are displayed in attendant parentheses. * $p < .05$; ** $p < .01$; *** $p < .001$.

RECOMMENDATIONS

The survey and interview data VETWAYS collected above support and extend findings from previous studies on SSM/Vs in colleges and universities. But what implications do results have for educators and leaders hoping to better support these students' academic and career success? Here, we collect several recommendations meant to improve SSM/Vs collegiate experiences, particularly with regard to military to college transitions, campus belonging, and social support network issues reported above.

1. Offer SSM/V-focused university orientations

Research suggests that the challenges SSM/Vs face as they enter the university—whether due to military/university cultural differences, mid-year enrollment, or students' transfer or first-generation status—can be partly alleviated by SSM/V-focused university orientation sessions or expositions for new incoming students (e.g., DiRamio & Jarvis, 2011; Semer & Harmening, 2015). This kind of programming not only communicates a veteran-friendly atmosphere, but also provides tailored information on financial aid and educational benefits, course enrollment, academic, career, and health counseling, campus social and organizational opportunities, military transfer credits, and other issues important to SSM/Vs.

- Orientation may take place in single-day, multi-day, or weekly formats, through classroom meetings or exposition-like events, depending on available timeframe and resources.
- Instruction can purposefully encourage new students to develop academic habits that harness students' familiarity with military culture and military skillsets (adaptability, discipline, schedules, teamwork).
- Organizers can involve campus student service providers (especially those trained in working with military-affiliated students), faculty veterans, researchers working on veteran issues, student organization representatives, and other community members working with service members or veterans.

- Cohort-style orientation meetings or expositions, in particular, can provide SSM/Vs with a chance to develop personal connections with other students, student services staff, faculty, and community members.
- While face-to-face welcoming sessions are important, contacts between university veteran service professionals and new SSM/Vs should ideally begin months before students arrive; these personal contacts, which can help build relationships, can focus on GI and Free Application for Federal Student Aid (FAFSA) paperwork and other campus- and academic-oriented tasks

2. Build SSM/V-specific community on campus

Our data also indicate that SSM/V college experiences are improved when these students' social support networks are comprised of other service members or veterans involved in the university, whether fellow students, staff, or faculty (e.g., Campbell & Riggs, 2015; Elliott, 2015). These relationships allow students to connect with others who have similar experiences, who are comfortable with the communication and interaction norms of military culture, and who often better understand what SSM/Vs are going through.

Relationships with fellow military service members or veterans allow SSM/Vs to connect with others who have similar experiences and who often better understand what SSM/Vs are going through.

With this in mind, bringing SSM/Vs together, with one another and with other faculty or staff veterans on campus is a good way to build social support networks that can help students succeed.

- Student service providers can organize and fund semi-regular social events—such as formal dinners, speaker series, athletic outings, or BBQ contests—bringing SSM/Vs together with others on campus
- Institutions can provide the funding and the dedicated space, preferably on central campus, to establish student veteran lounges where all SSM/Vs can hang out, study, and talk in a safe and open environment.
- Educators can encourage local military-affiliated student organizations, such as local Student Veterans of America (SVA) chapters or UW–Green Bay's Vets 4 Vets, by providing recruitment assistance, expert advice, meeting space, connections to speakers, or even funding for organizational events.
- Veteran recourse centers can act as the organizational hub for campus tutoring programs, peer-to-peer or faculty mentorship programs that bring SSM/Vs together with others who can provide much-needed social support as well as tacit knowledge of campus.
- Online spaces, organized and curated by campus veteran service staff, can also act as a hub for the university SSM/V affinity community.

3. Integrate SSM/Vs into the broader community

While camaraderie with fellow SSM/Vs can significantly improve students' academic experiences, studies also show that student integration into the broader community, on and off-campus, is a helpful way to foster belonging, a feeling that one "fits" in with others around them, and increased confidence and academic motivation. One way to establish this kind of integration is through programming that encourages SSM/V connections to nonveteran students, faculty, and staff. Integration can also be improved by building knowledge among campus and local community members about military culture and SSM/Vs, and forming partnerships with local organizations (e.g., Hammond, 2016; U.S. Department of Education, 2013).

- Educators working with veterans can coordinate campus events that bring student veterans or student veteran organizations together with non-veteran students, affinity organizations, and others interested in supporting members of the SSM/V community.
- Institutions can provide funding for veteran student service to offer "Green Zone" professional development training to campus faculty and staff, focused on instilling knowledge of military culture and SSM/V transitions to university.
- Similarly, educators can work to develop cocurricular opportunities for nonveteran students to learn about military culture and SSM/V experiences.
- Veteran resource centers can aim to foster increased student involvement with off-campus community leaders interested in supporting SSM/Vs, whether local employers, alumni, area businesses with a veteran focus, or veteran-centered organizations such as the American Legion, VFW, or Dryhooch.

4. Increase budgetary support for campus veteran resource centers and staff

Following through on even the most modest of these recommendations will require the UW System to increase support for campus veteran service staff, much of whose time is currently consumed with administratively complex but essential "certification" duties that allow these students timely receipt of their state and federal education benefits (e.g., Griffin & Gilbert, 2015). This certification workload, while central to SSM/V service, leaves little room (or resources) for the kinds of community-building initiatives discussed above (Kirchner, 2015). The situation is further exacerbated by annual shortfalls in the tens of millions of dollars between UW System SSM/V benefit outlays and state GI Bill reimbursements, which may give System leaders pause when considering expanded investment in these students. Taking into account the service and sacrifice of SSM/Vs, as well as the vital role these students will play in the state and country's future welfare after graduation, we believe leaders and administrators should consider support for SSM/Vs as an investment rather than an expense.

Following through on these recommendations will require increased support for campus veteran service staff and resource centers, many of which currently do not have the resources or time to lead community-building initiatives among SSM/Vs.

- Because benefit certification is a critical service that directly influences SSM/V financial viability from semester to semester, carving out more resources for SSM/V community-building programming will necessitate additional paid time for planning, coordination, and advising activities.
- Though certification and community building will require different work duties and areas of expertise, both positions are foundational to comprehensive, veteran-friendly SSM/V support; co-location in a veteran resource space, in this regard, would be beneficial.
- University leaders can consider moving veteran support personnel, who have traditionally been located in university finance or academic affairs departments, to student life-oriented centers.
- Such changes will not only allow more space for SSM/V community-building activities, but also send the message that SSM/Vs are an important, nondominant, affinity group whose perspectives and concerns deserve to be recognized and included in the university community.

Resources

- Ackerman, R., DiRamio, D., & Mitchell, R. L. G. (2009). Transitions: Combat veterans as college students. *New Directions for Student Services*, 2009(126), 5–14.
- Ahearn, L. M. (2014). Detecting research patterns and paratextual features in AE word clouds, keywords, and titles. *American Ethnographer*, 41(1), 17–30.
- American Council on Education (2014). *Higher Ed Spotlight: Undergraduate student veterans*. <http://combat2career.com/blog/ace-undergraduate-student-veteraninfographic-november-2014/>
- Barry, A. E., Whiteman, S. D., & Wadsworth, S. M. (2014). Student service members/veterans in higher education: A systematic review. *Journal of Student Affairs Research and Practice*, 51(1), 30–42.
- Barry, A. E., Whiteman, S. D., Wadsworth, S. M., & Hitt, S. F. (2012). The alcohol use and associated mental health problems of student service members/veterans in higher education. *Drugs: Education, Prevention and Policy*, 19(5), 415–425.
- Benbow, R. J. (September, 2020). *Student military service member and veteran transitions: The cultural importance of camaraderie and social support* [Research Brief]. The Veteran Education to Workforce Affinity and Success Study (VETWAYS). https://vetways.wceruw.org/wp-content/uploads/2020/09/Benbow_vetways_2020_University-Transitions.pdf
- Benbow, R. J., & Lee, YG (October, 2020). *Campus belonging among student military service members and veterans in STEM majors: A social network and social capital study* [Research Brief]. The Veteran Education to Workforce Affinity and Success Study (VETWAYS). https://vetways.wceruw.org/wp-content/uploads/2020/10/VETWAYS-10-2020_Belonging-1.pdf
- Borgatti, S. P. (1996). *Anthropac 4*. Analytic Technologies.
- Borgatti, S. P. (2006). *E-Network software for ego-network analysis*. Analytic Technologies.
- Braun, M. T., & Oswald, F. L. (2011). Exploratory regression analysis: A tool for selecting models and determining predictor importance. *Behavior Research Methods*, 43(2), 331–339.
- Burt, R. S. (1984). Network items and the general social survey. *Social Networks*, 6(4), 293–339.
- Burt, R. S., Meltzer, D. O., Seid, M., Borgert, A., Chung, J. W., Colletti, R. B., Dellal, G., Kaplan, H., Peterson, L., & Margolis, P. (2012). What's in a name generator? Choosing the right name generators for social network surveys in healthcare quality and safety research. *BMJ Quality Safety*, 21(12), 992–1000.
- Campbell, R., & Riggs, S. A. (2015). The role of psychological symptomatology and social support in the academic adjustment of previously deployed student veterans. *Journal of American College Health*, 63(7), 473–481.
- Charmaz, K. (2014). *Constructing grounded theory*. Sage.

- Creswell, J. W. & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research*. Sage.
- Crisp, G., Nora, A., & Taggart, A. (2009). Student characteristics, pre-college, college, and environmental factors as predictors of majoring in and earning a STEM degree: An analysis of students attending a Hispanic serving institution. *American Educational Research Journal*, 46(4), 924–942.
- DeBerard, M. S., Spielmans, G. I., & Julka, D. L. (2004). Predictors of academic achievement and retention among college freshmen: A longitudinal study. *College Student Journal*, 38(1), 66–81.
- DiRamio, D., Ackerman, R., & Mitchell, R. L. (2008). From combat to campus: Voices of student-veterans. *Journal of Student Affairs Research and Practice*, 45(1), 73–102.
- DiRamio, D., & Jarvis, K. (2011). Special issue: Veterans in higher education—When Johnny and Jane come marching to campus. *ASHE Higher Education Report*, 37, 1–144.
- Elliott, M. (2015). Predicting problems on campus: An analysis of college student veterans. *Analyses of Social Issues and Public Policy*, 15(1), 105–126.
- Gardiner, J. C., Luo, Z., & Roman, L. A. (2009). Fixed effects, random effects and GEE: What are the differences? *Statistics in Medicine*, 28(2), 221–239.
- Griffin, K. A., & Gilbert, C. K. (2015). Better transitions for troops: An application of Schlossberg's transition framework to analyses of barriers and institutional support structures for student veterans. *The Journal of Higher Education*, 86(1), 71–97.
- Hammond, S. P. (2016). Complex perceptions of identity: The experiences of student combat veterans in community college. *Community College Journal of Research and Practice*, 40(2), 146–159.
- Heller, D. E., Hendrickson, R., Griffin, K., Timmerman, T., & Gilbert, C. (2011, July). *Veterans' education in science and engineering: Evaluation design* (Working Paper #9). Center for the Study of Higher Education. <https://ed.psu.edu/cshe/working-papers/wp-10>
- Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate on Latino college students' sense of belonging. *Sociology of Education*, 70(4), 324–345.
- Kirchner, M. J. (2015). Supporting student veteran transition to college and academic success. *Adult Learning*, 26(3), 116–123.
- Livingston, W. G., Havice, P. A., Cawthon, T. W., & Fleming, D. S. (2011). Coming home: Student veterans' articulation of college re-enrollment. *Journal of Student Affairs Research and Practice*, 48(3), 315–331.
- Marin, A., & Hampton, K. N. (2007). Simplifying the personal network name generator: Alternatives to traditional multiple and single name generators. *Field Methods*, 19(2), 163–193.
- Mau, W. C. J. (2016). Characteristics of US students that pursued a STEM major and factors that predicted their persistence in degree completion. *Universal Journal of Educational Research*, 4(6), 1495–1500.
- Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia*, 22(1), 67.

- Molina, D., & Morse, A. (2015, April). Military-connected undergraduates: The current state of research and future work. American Council on Education, NASPA-Student Affairs Administrators in Higher Education, and RTI International. <https://www.acenet.edu/news-room/Pages/Research-Convening-Summary.aspx>
- National Science Board (2018). *Our nation's future competitiveness relies on building a STEM-capable U.S. workforce: A policy companion statement to science and engineering indicators 2018*. National Science Foundation.
- National Survey of Student Engagement (2010). *Major differences: Examining student engagement by field of study*. Indiana University Center for Postsecondary Research.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research*. Jossey-Bass.
- Pearson, K. (1900). On the criterion that a given system of deviations from the probable in the case of a correlated system of variables is such that it can reasonably supposed to have risen from random sampling. *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, 50(302), 157–175.
- Perry, B. L., Pescosolido, B. A., & Borgatti, S. P. (2018). *Egocentric network analysis: Foundations, methods, and models*. Cambridge University Press.
- QSR International. (2016). NVivo 11. <https://www.qsrinternational.com/nvivo-qualitative-data-analysissoftware/home>
- R Core Team (2019). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Romero, D. H., Riggs, S. A., & Ruggero, C. (2015). Coping, family social support, and psychological symptoms among student veterans. *Journal of Counseling Psychology*, 62(2), 242–252.
- Rumann, C. B., & Hamrick, F. A. (2010). Student veterans in transition: Re-enrolling after war zone deployments. *The Journal of Higher Education*, 81(4), 431–458.
- Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field Methods*, 15(1), 85–109.
- Semer, C., & Harmening, D. S. (2015). Exploring significant factors that impact the academic success of student veterans in higher education. *Journal of Higher Education Theory & Practice*, 15(7), 31–43.
- Smith, J. J., & Borgatti, S. P. (1997). Salience counts—and so does accuracy: Correcting and updating a measure for free-list-item salience. *Journal of Linguistic Anthropology*, 7, 208–209.
- StataCorp. (2019). *Stata statistical software: Release 16*. StataCorp LLC.
- Stewart, S., Lim, D. H., & Kim, J. (2015). Factors influencing college persistence for first-time students. *Journal of Developmental Education*, 12–20.

- U.S. Department of Education (2013). *8 Keys to success: Supporting veterans, military and military families on campus*. <http://www.ed.gov/blog/2013/08/8-keys-to-success-supporting-veteransmilitary-and-military-families-on-campus/>
- U.S. Department of Education, National Center for Education Statistics (NCES) (2020). *The condition of education 2020: Immediate college enrollment rate*. <https://nces.ed.gov/fastfacts/display.asp?id=51>
- U.S. Department of Veterans Affairs (VA) (2017). *Wisconsin veteran population projection model, full-year 2016*. <https://www.va.gov/vetdata/statesummaries.asp>
- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. Cambridge University Press.
- Welch, B. L. (1938). The significance of the difference between two means when the population variances are unequal. *Biometrika*, 29(3/4), 350–362.
- Welch, B. L. (1947). The generalization of 'Student's' problem when several different population variances are involved. *Biometrika*, 34(1/2), 28–35.
- Weller, S. C., & Romney, A. K. (1988). *Systematic data collection*. Sage.

Appendix I: Research Methods

Approach

The data in this report were gathered for a larger study focused on the connections between SSM/V personal networks and science, technology, engineering, mathematics, or medical (STEMM) career pathways among students in the state of Wisconsin. This study uses a convergent mixed-methods case study approach (Creswell & Plano Clark, 2018). In this approach, a bounded issue or phenomenon is explored using equally highlighted quantitative and qualitative data. These data are collected simultaneously and then analyzed separately to answer attendant research questions. Ultimately, quantitative and qualitative results are meant to be interpreted together to provide a wider, triangulated interpretation of the central phenomenon. Study methods and approaches are displayed in Table 9.

Sampling

Data include SSM/V survey and interview responses across five Wisconsin public universities chosen for their institutional and geographic diversity. The researchers used a purposeful, nonprobability procedure to recruit SSM/Vs, defined as currently enrolled undergraduate students in the National Guard or Reserves or who had completed military service (Barry et al., 2014), by asking veteran service coordinators in each of the five universities to email all identified SSM/Vs study information and an online survey link in spring 2020. Emails elicited 623 survey responses from SSM/Vs across the institutions (31% response rate), with each respondent receiving a \$25 electronic Amazon gift certificate for their participation. Because this response rate limits our ability to generalize beyond the sample, readers should interpret overall survey results with caution.

Interviewee participants were recruited through the online survey. At the survey's end, SSM/V respondents who had earlier listed a STEMM major in Biological or Life Science, Engineering, Health, Mathematics or Computer Science, Physical Science, or Social Science (National Science Board, 2018) were asked if they were interested in qualitative participation. Those who volunteered were asked to provide contact information for interview scheduling. Fifty-four SSM/V in total participated in these interviews, each of whom received \$30 for their time. To ensure as many different perspectives as possible in interviews, we purposefully included more underrepresented minorities, women, first-generation students, and persons with disabilities in our interview sample when we were able to choose among multiple volunteers.

Table 9. Study methods

Approaches	Convergent mixed methods / Case study / Longitudinal / Personal social network analysis
Sites	UW–Green Bay / UW–Madison / UW–Milwaukee / UW–Oshkosh / UW–Stout
Participants	Student military service members and veterans (surveys) / Student military service members and veterans in STEMM majors (interviews)
Instruments	Online surveys / Zoom/Skype semi-structured interviews
Analysis	Descriptive and correlational statistics (surveys) / Segmentation, freelist analysis, and inductive coding (interviews)

Surveys

SSM/V online surveys were designed primarily to gather social support network measures using “ego network” techniques in which questions elicit the details of social ties around each individual (Perry et al., 2018). Other items were meant to gather multiple measures on respondent educational and military experience. The research team conducted several cognitive tests of the Qualtrics instrument, asking several volunteer SSM/Vs and veteran coordinators at participating institutions to complete the survey with a researcher present to whom they could ask questions and comment as they went through the survey (e.g., Bernard, 2011). After making multiple changes to the survey based on these tests, the research team piloted the online survey with 54 SSM/Vs nationwide through Qualtrics. With feedback and results from this initial sample, the research team finalized the instrument for administration in Wisconsin.

Surveys took about 15 minutes to complete. Following methods described in Marin and Hampton (2007), the instrument included two separate “name generator” questions designed to elicit alters whom respondents talk to about personal and academic/career matters (Burt, 1984; Burt et al., 2012; Marin & Hampton, 2007). These read as follows:

Personal network: Please list people with whom you have discussed matters important to you—like good or bad things that happen to you, problems you are having, or important concerns you may have—during the last 6 months.

Academic/career network: Please list people with whom you have discussed academic or career matters—like your major area of study, academic or career goals, or job opportunities—during the last 6 months.

After respondents list as many as 10 unique alters in answer to these name generators, we asked them to characterize every alter and alter relationship by factors shown to be important to networks in previous research, including the role of each alter (fellow student, college educator, family, etc.); how close participants felt to them (distant, less than close, close, etc.); each person’s education level (high school, associate’s degree, bachelor’s degree, etc.); and whether alters knew one another (Ackerman et al., 2009; Barry et al., 2012; DeBerard et al., 2004; Molina & Morse, 2015). The survey also asked questions about student high school, military, and demographic characteristics, university life, career plans and considerations, as well as several demographic items based on age, gender, race/ethnicity, and parents’ education level.

Interviews

Semi-structured interview protocols were designed by the research team to elicit student perspectives and experiences regarding their education and career pathways and social support networks. Initial versions of the protocol were tested with the help of several SSM/Vs and veteran coordinators at participating institutions. After mock interviews, researchers talked through different items on the protocol with these participants. Using participant suggestions and feedback, researchers edited the instrument, retested with more participants, and finalized.

Student interviews took place in March, April, and May 2020 over Zoom and Skype online video platforms. Each lasted about an hour. Interviews began with a “freelist” exercise, a method used to determine items that cultural group members categorize in a particular cultural domain, here facets of military life missing from the university (Weller & Romney, 1988). The freelist prompt read as follows: “What facets of military life or culture, if any, are missing from university life or culture? Please type all the words or short phrases that come to mind.” After each student provided a type-written list of cultural items in the online chat window, they were asked to describe each item’s meaning, if and how items spoke to their university transition, and their overall impressions of their transition. Interviews then moved to questions about SSM/V personal and military experiences, then questions regarding identified social support networks from respondents’ surveys, feelings of campus belonging, and other educational and career issues. After interviews were completed, SSM/V freelist responses were copied and pasted into a Word document; audio recordings of the interviews were transcribed and uploaded to NVivo 11 (QSR International, 2016).

Analysis

Quantitative

Survey data presented in this report were analyzed in three stages after the initial data cleaning was performed in R (R Core Team, 2019). First, we organized the data from the personal network section of the survey in *Stata* (StataCorp, 2019), then analyzed it in *E-NET* (Borgatti, 2006) as well as R to generate a series of social support network measures that we used in analyses. Second, we calculated basic descriptive statistics measuring central tendency, frequency, and/or variability (Mishra et al., 2019) on the participating SSM/Vs’ personal information and social network measures presented in the report’s tables. To help readers from each institution better understand how SSM/Vs from their university compare with SSM/Vs from the other participating universities, we performed either Welch’s unequal variances t-test (Welch, 1938; Welch, 1947) or Pearson’s Chi-squared test (Pearson, 1900) on selected personal and social network measures presented in this report. Third, we conducted exploratory regression analyses (Braun & Oswald, 2011) to identify important predictors while exploring the relationships among SSM/Vs’ personal characteristics, social support network measures, and selected outcome measures. We also included a university fixed effect (Gardiner et al., 2009) in our models to control for the average differences across universities in any observable or unobservable predictors. The important predictors we identified in our analyses are presented and discussed.

Qualitative

Interview data presented in this report were analyzed in two stages. First, to provide data on SSM/V transitions into college, native freelist terms representing facets of military life SSM/Vs thought were missing from university life (see Benbow, 2020) were standardized and loaded into *Anthropac* (Borgatti, 1996). Here terms were analyzed by how many participants mentioned each term. Frequency scores for the 10 most often mentioned terms among UW–Madison interviewees and interviewees from the other four universities are displayed. To further visualize these terms and their importance, we also copied and pasted all standardized freelist terms listed by UW–Madison SSM/Vs into [Wordclouds.com](https://www.wordclouds.com/), an online program that creates visual diagrams in which terms more often mentioned are larger proportionally than those less frequently mentioned (e.g., Ahearn, 2014).

To speak to student perspectives on other important issues in this report, student interviews were coded and analyzed in *NVivo 11*, a qualitative analysis software program. Here, researchers first segmented all UW–Madison student interviews by topic (transitions from military into university, belonging, etc.). For each major subject reported above, then, the first author analyzed attendant interview segments to detail prominent ideas mentioned for that subject among UW–Madison SSM/Vs, grouping similar interviewee statements together into discrete themes. Here, the author chose student quotations to represent more often-mentioned ideas and in a few instances developed subthemes from interviews to form cohesive, subthematic definitions (Charmaz, 2014; Ryan & Bernard, 2003).

Appendix II: Full Regression Tables

Table 10. Regression of outcome variables on SSM/V individual and institutional characteristics

	Outcome Measures			
	Belonging	Academic integration	Veteran lounge use	COVID-19 social support
Individual				
Female	0.13	0.01	0.05	-0.001
	(0.10)	(0.04)	(0.07)	(0.11)
White	-0.17	-0.09*	-0.06	-0.20
	(0.11)	(0.04)	(0.07)	(0.12)
Age	-0.01	-0.003	0.01*	0.005
	(0.01)	(0.002)	(0.003)	(0.007)
High school GPA	0.02	-0.001	0.01	0.03
	(0.03)	(0.01)	(0.02)	(0.04)
Enrollment level	-0.10**	0.03	-0.08***	0.04
	(0.04)	(0.01)	(0.02)	(0.04)
Dependents	-0.27*	-0.08	-0.19**	-0.21
	(0.11)	(0.04)	(0.07)	(0.13)
Combat pay	-0.16	0.03	0.02	0.08
	(0.09)	(0.03)	(0.06)	(0.10)
First generation	-0.07	-0.05	-0.06	-0.03
	(0.09)	(0.04)	(0.06)	(0.11)
Institution				
UW–Madison	0.36*	0.10	-0.29**	-0.65***
	(0.14)	(0.06)	(0.09)	(0.19)
UW–Milwaukee	0.07	-0.004	-0.05	-0.42*
	(0.13)	(0.05)	(0.09)	(0.18)
UW–Oshkosh	0.01	0.004	0.07	-
	(0.14)	(0.05)	(0.09)	-
UW–Stout	0.11	0.04	-0.27**	-0.26
	(0.13)	(0.05)	(0.09)	(0.23)

Note: UW–Oshkosh SSM/Vs did not participate in the COVID-19 section of the survey. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 11. Regression of outcome variables on SSM/V social support network characteristics

	Outcome Measures			
	Belonging	Academic integration	Veteran lounge use	COVID-19 social support
Personal matters network size	0.07**	0.04**	0.06**	-0.02
	(0.03)	(0.01)	(0.02)	(0.03)
Academic/career network size	0.05***	0.05***	0.03**	-0.03
	(0.01)	(0.01)	(0.01)	(0.02)
Combined network size	0.06***	0.03***	0.03**	-0.04
	(0.02)	(0.01)	(0.01)	(0.02)
Educator percentage	0.01***	0.01***	0.01***	-0.004
	(0.002)	(0.001)	(0.002)	(0.003)
Fellow student percentage	0.01**	0.003**	0.01**	-0.01**
	(0.003)	(0.001)	(0.002)	(0.003)
Tie strength	-0.09	-0.10**	-0.20***	0.25**
	(0.08)	(0.03)	(0.06)	(0.10)
Highest degree	-0.04	0.06**	0.08*	0.08
	(0.06)	(0.02)	(0.04)	(0.06)
Effective size	0.05**	0.04***	0.03*	0.04
	(0.02)	(0.01)	(0.01)	(0.02)

*Note: Each social support network measure association with each outcome was tested with gender, race/ethnicity, age, high school GPA, enrollment level, dependent status, combat experience, first generation status, and institution as covariates. Results for these covariates are not reported. UW-Oshkosh SSM/Vs did not participate in the COVID-19 section of the survey. * p < .05; ** p < .01; *** p < .001*



The Veteran Education to Workforce
Affinity and Success Study

About

The Veteran Education to Workforce Affinity and Success Study (VETWAYS) is a three-year National Science Foundation-funded project focused on the social support networks and career pathways of a growing and increasingly important segment of the U.S. college student population: military service members and veterans.

Contact Us

Dr. Ross Benbow, Principal Investigator
University of Wisconsin-Madison
Wisconsin Center for Education Research
551J Educational Sciences Building
1025 W. Johnson Street
Madison, WI 53706
vetways@wcer.wisc.edu
vetways.wceruw.org



This project is supported by National Science Foundation award #1920482. The opinions, findings, and conclusions or recommendations expressed here are those of the UW-Madison VETWAYS research team and do not necessarily reflect the views of the National Science Foundation.



**Wisconsin Center for
Education Research**

SCHOOL OF EDUCATION

UNIVERSITY OF WISCONSIN-MADISON