Welcoming Student Veterans to Engineering: An Interactive Session for Faculty and Administrators

Dr. Catherine E. Brawner, Research Triangle Educational Consultants

Catherine E. Brawner is President of Research Triangle Educational Consultants. She received her Ph.D.in Educational Research and Policy Analysis from NC State University in 1996. She also has an MBA from Indiana University (Bloomington) and a bachelor's degree from Duke University. She specializes in evaluation and research in engineering education, computer science education, and technology education. Dr. Brawner is a founding member and former treasurer of Research Triangle Park Evaluators, an American Evaluation Association affiliate organization and is a member of the American Educational Research Association and American Evaluation Association, in addition to ASEE. Dr. Brawner is also an Extension Services Consultant for the National Center for Women in Information Technology (NCWIT) and, in that role, advises computer science and engineering departments on diversifying their undergraduate student population. She remains an active researcher, including studying academic policies, gender and ethnicity issues, transfers, and matriculation models with MIDFIELD as well as student veterans in engineering. Her evaluation work includes evaluating teamwork models, broadening participation initiatives, and S-STEM and LSAMP programs.

Dr. Catherine Mobley, Clemson University

Catherine Mobley, Ph.D., is a Professor of Sociology at Clemson University. She has over 30 years experience in project and program evaluation and has worked for a variety of consulting firms, non-profit agencies, and government organizations, including the Rand Corporation, the American Association of Retired Persons, the U.S. Department of Education, and the Walter Reed Army Institute of Research. Since 2004, she been a member of the NSF-funded MIDFIELD research project on engineering education; she has served as a Co-PI on three research projects, including one on transfer students and another on student veterans in engineering.

Dr. Susan M Lord, University of San Diego

Susan M. Lord received a B.S. from Cornell University in Materials Science and Electrical Engineering (EE) and the M.S. and Ph.D. in EE from Stanford University. She is currently Professor and Chair of Integrated Engineering at the University of San Diego. Her research focuses on the study and promotion of diversity in engineering including student pathways and inclusive teaching. She is Co-Director of the National Effective Teaching Institute (NETI). Her research has been sponsored by the National Science Foundation (NSF). Dr. Lord is among the first to study Latinos in engineering and coauthored The Borderlands of Education: Latinas in Engineering. Dr. Lord is a Fellow of the IEEE and ASEE and is active in the engineering education community including serving as General Co-Chair of the Frontiers in Education Conference, President of the IEEE Education Society, and Associate Editor of the IEEE Transactions on Education (ToE) and the Journal of Engineering Education (JEE). She and her coauthors received the 2011 Wickenden Award for the best paper in JEE and the 2011 and 2015 Best Paper Awards for the IEEE ToE. In Spring 2012, Dr. Lord spent a sabbatical at Southeast University in Nanjing, China teaching and doing research. She is on the USD team implementing "Developing Changemaking Engineers", an NSF-sponsored Revolutionizing Engineering Education (RED) project. Dr. Lord is the 2018 recipient of the IEEE Undergraduate Teaching Award.

Dr. Joyce B. Main, Purdue University-Main Campus, West Lafayette (College of Engineering)

Joyce B. Main is Associate Professor of Engineering Education at Purdue University. She received an Ed.M. in Administration, Planning, and Social Policy from the Harvard Graduate School of Education, and a Ph.D. degree in Learning, Teaching, and Social Policy from Cornell University. Dr. Main examines student academic pathways and transitions to the workforce in science and engineering. She was a recipient of the 2014 American Society for Engineering Education Educational Research and Methods Division Apprentice Faculty Award, the 2015 Frontiers in Education Faculty Fellow Award, and the 2019 Betty

Vetter Award for Research from WEPAN. In 2017, Dr. Main received a National Science Foundation CAREER award to examine the longitudinal career pathways of engineering PhDs.


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CATHERINE MOBLEY, CLEMSON UNIVERSITY
SUSAN M. LORD, UNIVERSITY OF SAN DIEGO
JOYCE B. MAIN, PURDUE UNIVERSITY

What are your roles as they relate to student veterans at your institution?

Faculty	**SV Organization advisor/sponsor**	**Advisor**
Student Affairs	**Department Administration**	**VA Certifying Official**
Disability Services	**SV Research**	**Admissions**
SV Success Center	**Counseling Center**	**Other Role**

As people walk into the room, they will be asked to place sticker dots in the role or roles that they hold at their institution. This will help us frame our discussion.

We anticipate that most dots will be on the faculty role with maybe department administration, advisor, and student affairs. We will ask people to raise their hands for each bunch of dots and ask a few to introduce themselves and their role.

Others will probably have zero dots, which is expected and something we should directly address – that is that the people in this room need to be advocates and allies and that there are other people on campus who serve vets. The people here room need to educate themselves on the other roles to be effective advocates and understand how to help SVs. However, understanding the roles present, we will try to give some advice about how to deal with veterans in their classrooms and offices.

Ask how many people in the room are also veterans themselves.

What services does your campus offer specifically for student veterans?

Priority/advance registration	Veteran-specific orientation	Single Point of Contact for veterans' admission
Consolidated veteran-specific web page	Veterans' center/lounge	Veteran-specific advising
Green Zone/Military Ally Training	Tuition payment options to align with GI Bill	Yellow Ribbon Program
Recruiting and outreach to local military bases	Student Veterans of America chapter	Automatic excused absence for Reserve/National Guard duty
Tuition refund for Reserve/ National Guard deployment	Other	I have no idea

Participants will be asked to put a sticker on the services that their institution provides. This information will be introduced later in the session.

Session Overview

Context: Veterans in higher education and engineering

Our study and methods

Assets and skills brought by veterans to engineering education

Challenges faced by veterans transitioning to engineering classrooms

Accommodating veteran challenges

Promising practices

This presentation is not as linear as it would seem from this overview. We hope to let participants learn from others in the room as well as from our research.

National Context for SV Research in STEM

The Post-9/11 GI Bill is expected to fund 100,000 degrees per year (Student Veterans of America, 2017)

SVs using the Post-9/11 GI Bill from 2011-2015 are expected to earn 18,000 degrees in engineering and related fields and 22,000 degrees in computing related fields at all levels (Cate, et al., 2017)

Post-9/11 GI Bill Enhancements may allow additional benefits to STEM students (US Department of Veterans Affairs, 2019)

$75 billion in financial aid (mostly GI Bill) (Student Veterans of America and Institute for Veterans and Military Families, 2017)

Regarding the Cate reference, The NVEST project looked at data from first time users of Post-9/11 GI bill benfits from 2011-2015 and took a snapshot of their outcomes in Sept. 2015. Based on enrollment patterns, attrition, etc. they came up with these projected numbers. Numbers are for all levels (AA, BS, Grad).

GI bill enhancements for STEM include an additional 9 months beyond the 36 months for students in programs requiring more than 128 hours, like many engineering programs.

Our Project:
Military Veteran Students' Pathways in Engineering Education

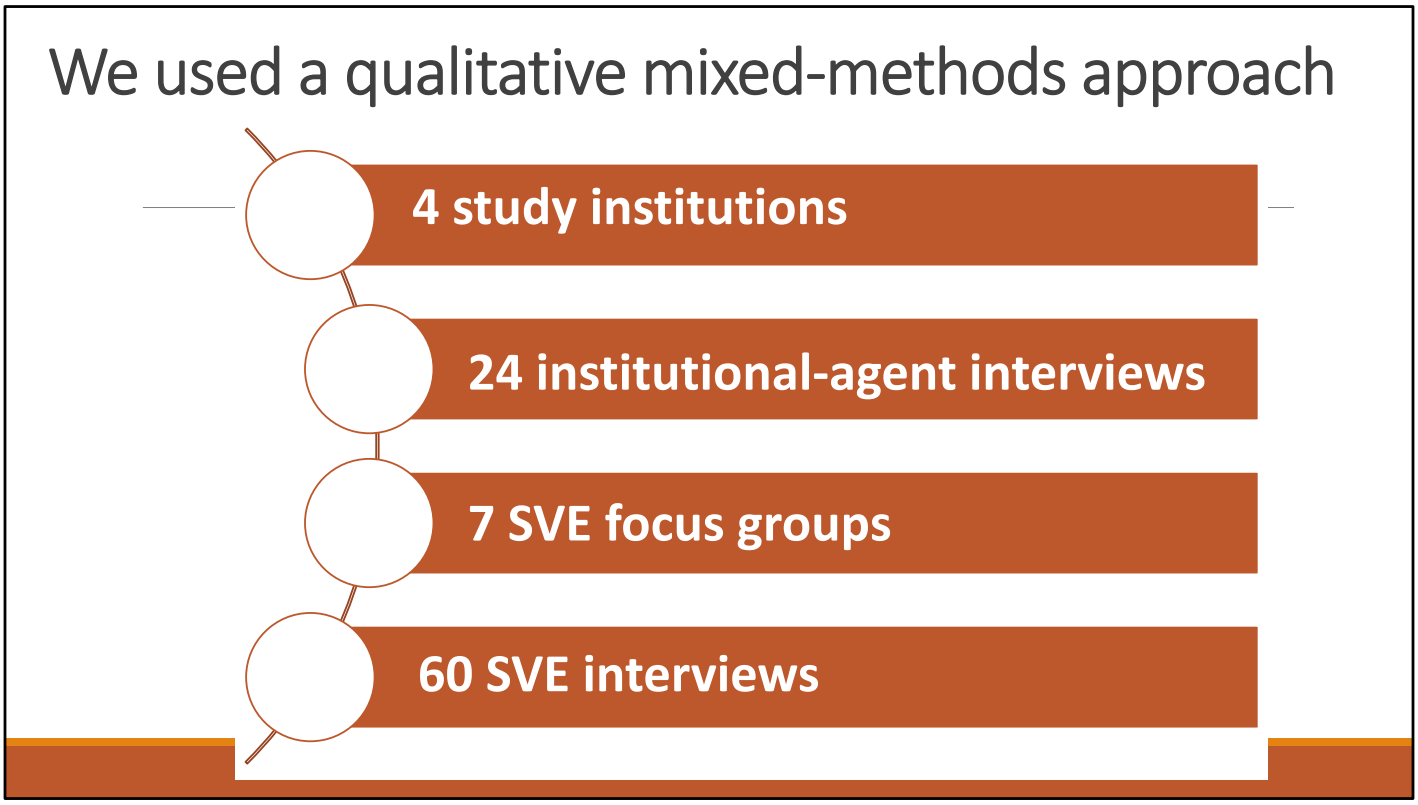
Research Questions

1. Why do veterans pursue a Bachelor's degree in engineering?
2. How do military experiences shape student veterans' educational experiences?
3. What are the experiences of student veterans in engineering education?
4. How do institutions support veterans in engineering education?

Research Questions

1. Why do veterans pursue a Bachelor's degree in engineering?
2. How do military experiences shape student veterans' educational experiences?
3. What are the experiences of student veterans in engineering education?
4. **How do institutions (and the people in them) support veterans in engineering education?**

This presentation seeks to share what we've learned, with particular attention to the fourth question regarding institutional support – what do veterans find valuable and what supports are missing? We also hope to give faculty and staff some ideas about how they can better support veterans in their classrooms and departments.



We focus on student veterans and contributions to diversity in engineering education.

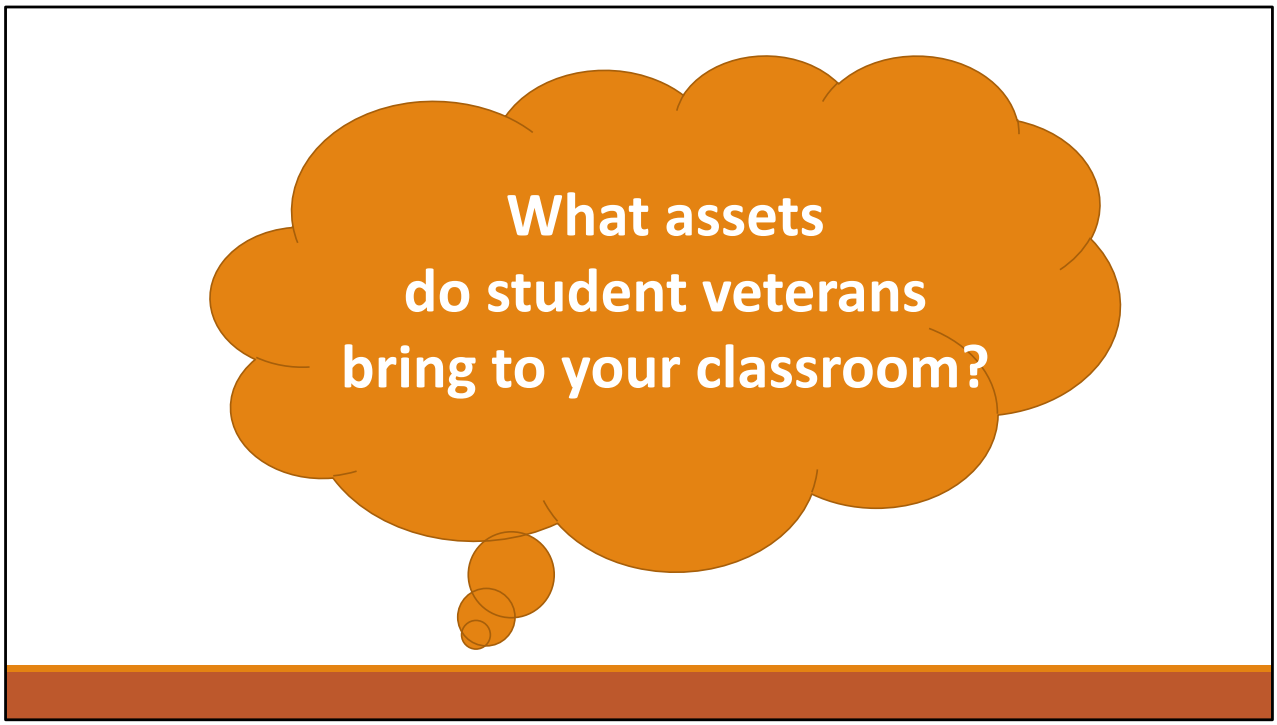
The four study institutions were Clemson, NC State, Purdue, and University of San Diego. Focus groups and interviews were conducted at all four locations by the project team from 2014 through early 2017.

The themes we uncovered may resonate with other underrepresented populations (e.g., people with disabilities, older students), as all of our students are striving to succeed in a broader institutional context, which is shaped by policies, programs and services created and delivered by a wide variety of institutional agents.

We focus on veteran strengths, celebrating the diversity and experience that they bring to the classroom, while acknowledging that there are challenges. We approached our research and analysis with the understanding that the institution and the veteran share responsibility for the SV's success. For example:

Veterans may need to brush up on needed math skills at community college (fix the veteran)

Institutions can provide single point of contact for veterans' issues (fix the institution)



2-3 minutes
Think about your experiences with student veterans in your classroom. What assets do they bring? Then share with your neighbor(s).
Ask for some or all of the pairs to share with the whole group.

SVE Assets in Engineering Education

Discipline	Persistence	Maturity
"**Forming those habits of being disciplined** in your studies, going to bed early, waking up early, not drinking too much every night. Things like that have helped [in engineering studies]." *(Army, CHE)*	"A lot of my friends came here and tried this program and couldn't do it and ended up switching majors. **And I've stuck it out**" *(Navy, ME)*	"I think it's easier for me to be focused because I've already done the staying out late or the partying… **I understand the importance of showing up to class well-rested** and not hung over." (*Navy, ME*)

Depending on how the discussion goes we will either confirm or expand on what the people in the room have mentioned about assets that SV's bring to their classroom. The quotations here are from our focus groups and interviews.

SVE Assets in Engineering Education

Leadership

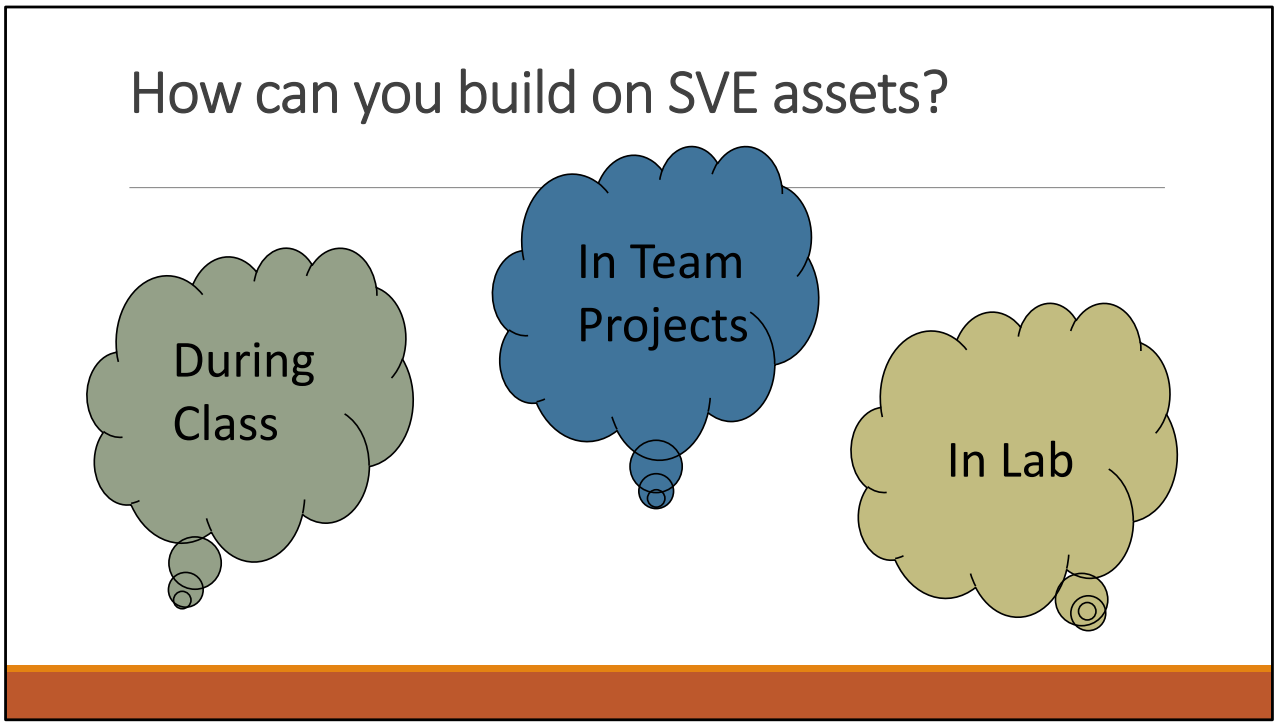
"[The military offers] a lot of **leadership training and experience**, which helps the engineering part of my education. We're working in groups, and I know how to be a group leader or project manager better and work efficiently with people." *(National Guard, ME)*

Teamwork

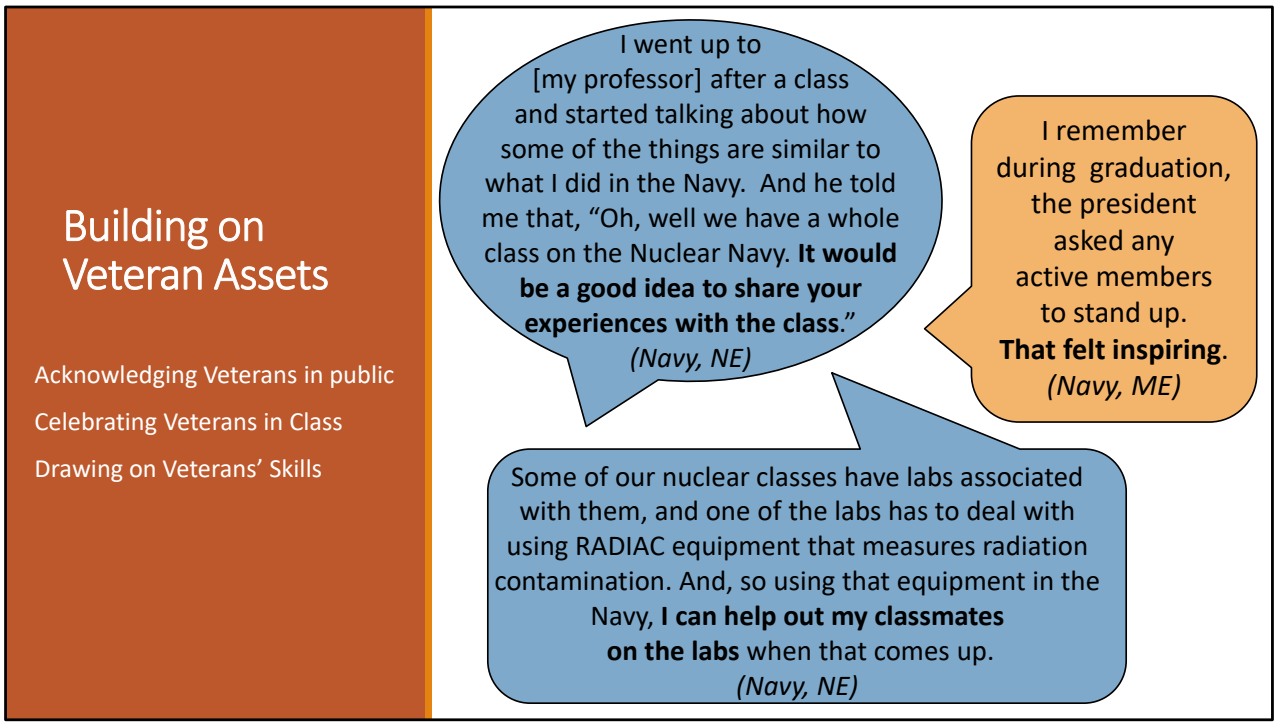
"I like to sit back and know how the team is doing. If the team is going well, I'll kind of let them do their thing; **however, [if] they need my help, I'll go and do it**." *(Navy, ECE)*

Technical Training

"I was an electronics technician, so I had really **in-depth knowledge about electricity and circuits**… that definitely helped me in the undergraduate electronics classes." (*Navy, EE*)



3-5 minutes – group exercise
Depending on the size of the group, we will likely assign each of these topics to a few pairs. If there are only a few people, then we will have everyone discuss all three topics.
After the pairs/small groups have had time to discuss, we will ask some or all of the groups to share their ideas. At least one group per topic.



When acknowledging veterans, be sure to let them choose whether to reveal their status.

2-3 minutes
Think for a moment about the challenges that student veterans bring to your classroom.
Then share with your neighbor(s).
Ask for some or all of the pairs to share with the whole group.

Student Veteran Challenges

- Being Older
- Not fitting in
- Impatience with younger students

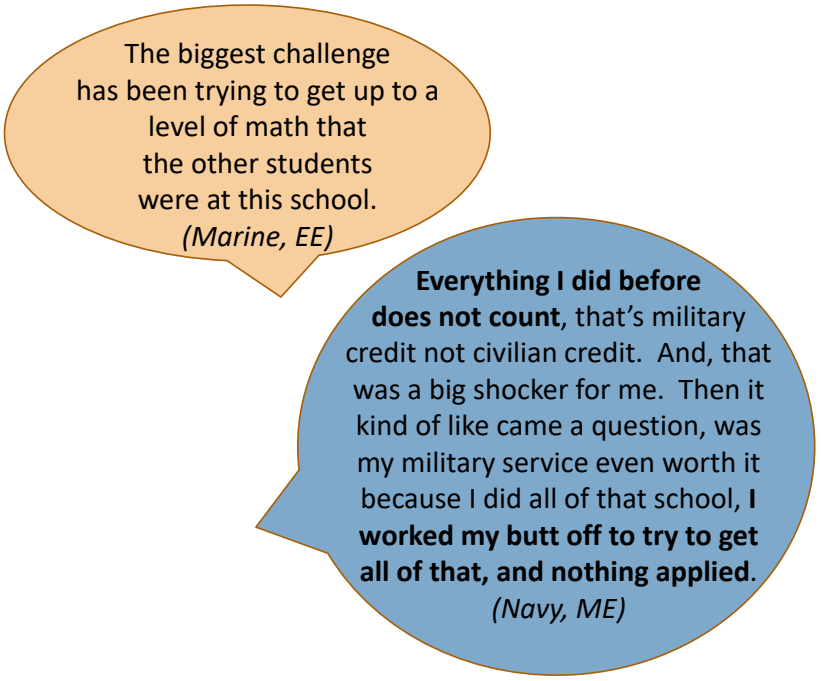
Really, **the hardest thing I do is juggling family, my student organizations, and my homework**, It's just "Okay, put it in the schedule. This is what I have time for," instead of the distractions that usually come with young people trying to prioritize their lives. *(Marine, AgE)*

I've done a lot of living they haven't. So that understanding of what actual life is, what the consequences are, what decisions you make now can affect your future five years from now. I understand that, I've seen it, in brutal reality. Most of them haven't seen that and it's not their fault. **It just makes it hard to really connect with them sometimes**. *(Marine, TXE)*

I come from an environment where if you say you're going to do something, you have to do it. I'm instantly set off. You can't tell from the outside, but on the inside I just wanna' start screaming at this guy [who didn't meet his commitment]. …**You can't expect me to go from these environments to where I make these life-and death decisions all the time to just working with somebody who doesn't give a s***. *(Navy, EE)*

Student Veteran Challenges

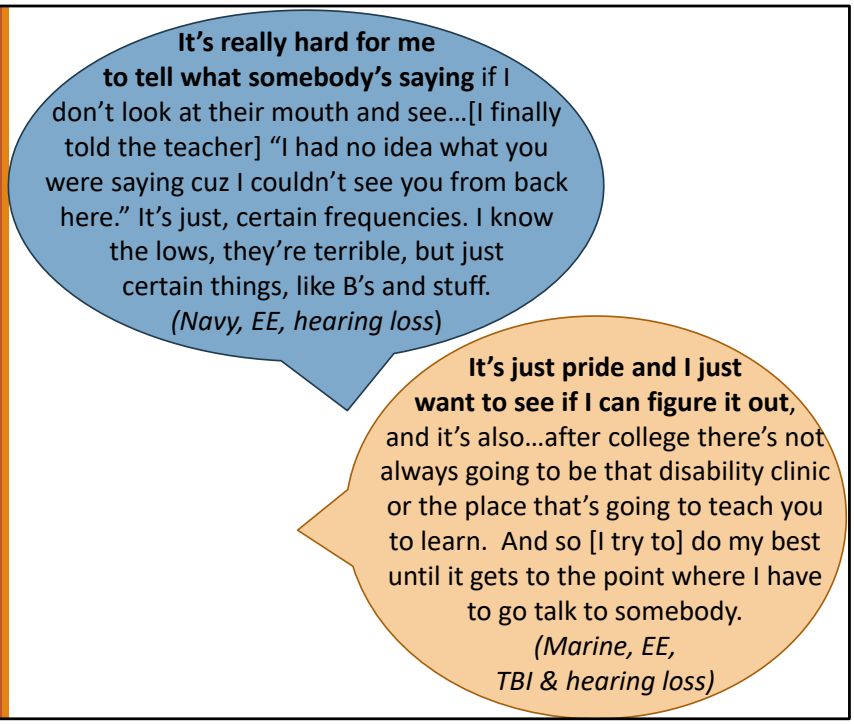
- Lack of math preparation
- No college credit for military training



Much of the disgruntlement over lack of credit for military training comes from the highly trained students who were in the Navy nuclear program or Explosive Ordnance Disposal in the Army and Marine Corps or other technical fields. Sometimes what they have learned is classified and can't be revealed to civilian institutions. Other times technical information is provided but without the theory and math behind it that is such a large part of undergraduate engineering education.

Student Veteran Challenges

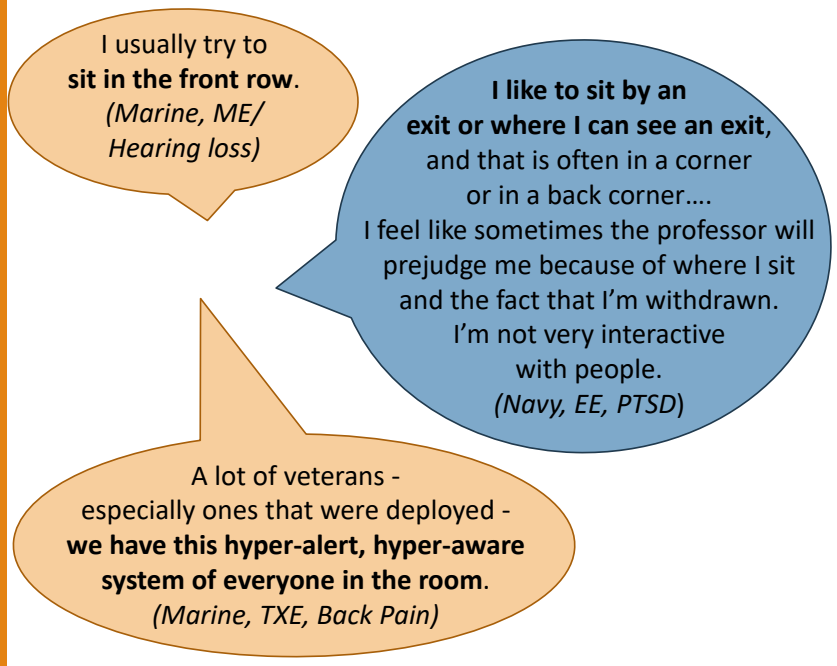
- (Invisible) Service-related injuries
- Unwillingness to seek help



We talked to many veterans who had experienced TBI – concussions from explosions; hearing loss either from explosions or working in a noisy environment (e.g., behind planes in an aircraft carrier) and back injuries from carrying heavy loads, falls, or explosions.

Considering Student Veteran Challenges

- Seating preferences



Considering Student Veteran Challenges

- Accommodating multiple learning styles

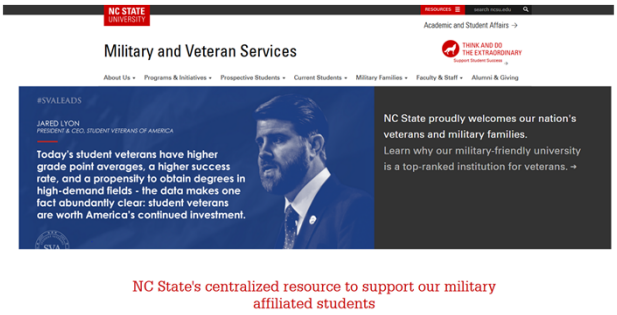
I guess, the fact that I can work with machines really attracted me to engineering 'cuz I am a hands-on person. **Reading something from a book doesn't really help explain certain things**. I do understand that theoretical problems will be able to help you out, but **I can understand things better by touching it and feeling it and knowing how it works and moves**. (*Marine, ME*)

With traumatic brain injury, you have a lot of memory issues. For me, sometimes I have to go over things a lot, so I can retain it. **I'm much more of a visual learner**. I need to see something. If someone just sits up somewhere and just talks, it really does nothing for me. I just can't—like I need to see things. (*Marine, EE*)

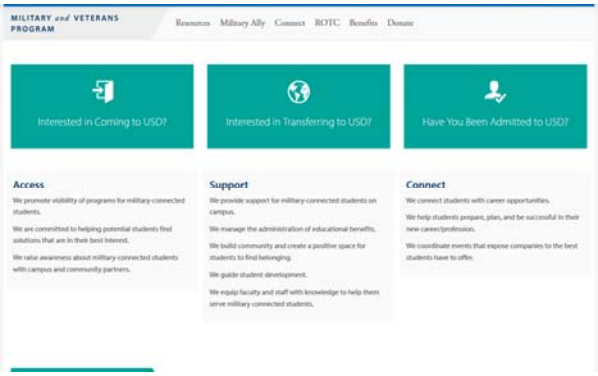
Promising Practices

Refer to the second poster where people put their dots to see what practices are offered on the various campuses of the participants.

One Stop Shopping

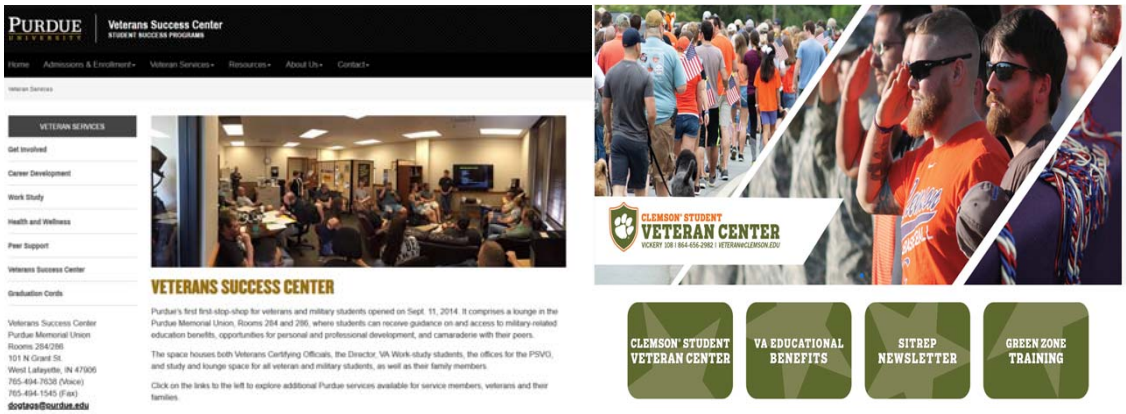


NC State's centralized resource to support our military affiliated students



At NC State and USD, there is a veteran's web page that has links to the various support services with a veteran-specific focus.

Veterans' Center



A place for veterans to gather where they can be around others who have had similar experiences. Here, they don't need to worry about watching their language or feeling like they need to explain things to people.

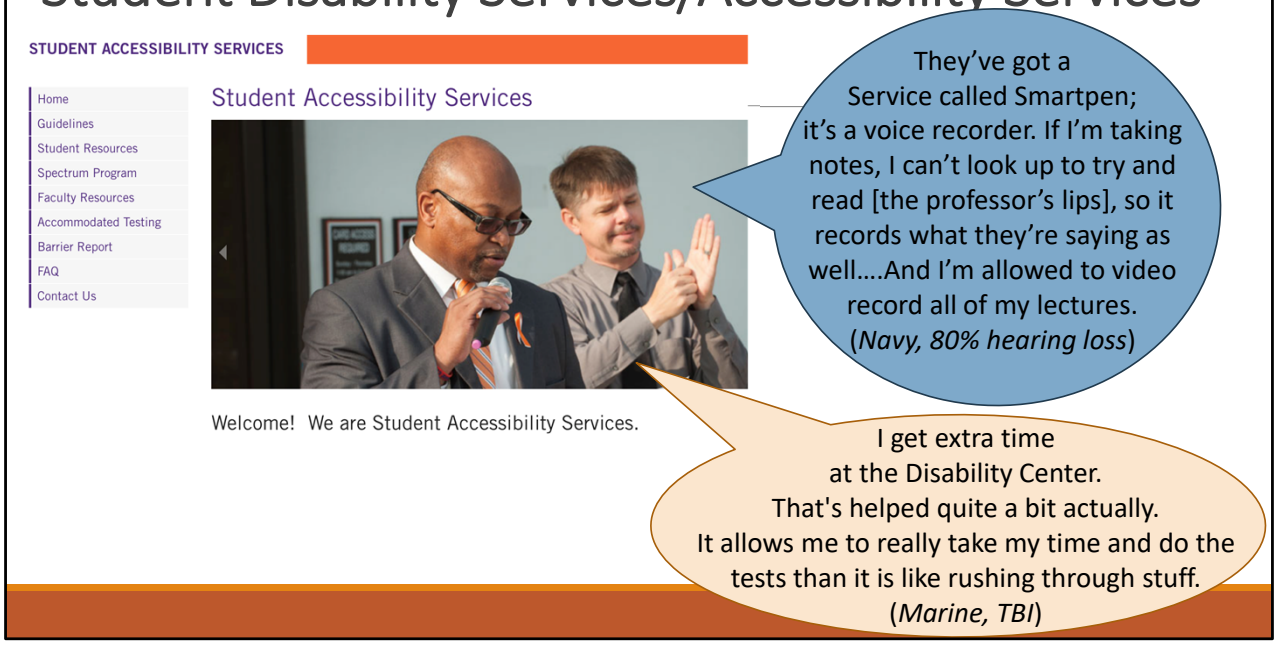
Note that some SVEs really value this and others don't. Some prefer to leave their military service behind them. Others feel intimidated by people of higher rank, even though they have left the service.

Student Veterans of America Chapter

One thing that helps is **having a Veterans' group to connect with.** It really is helpful to be able to talk to people that do have my background, that do understand the exact same things I'm going through and to just decompress. *(Marine, TXE)*

Note that some SVEs really value this and others don't. Some find it the place to be around "their people" others are happy for the advocacy that the group provides. But, like the veterans' centers, it isn't for everyone.

Student Disability Services/Accessibility Services



TBI = traumatic brain injury

Feature Articles

Feature articles in campus publications are a good way to celebrate student veterans and what they bring to campus.

Veteran-Specific Orientation

I ended up making friends that very day. I mean I met some of my very close friends now from just that [veterans] orientation. *(Marine, CE)*

Military and Veteran Summit

Each year, we welcome all new military affiliated students to campus during our Military and Veteran Summit.

The Summit is specifically designed as a welcome for all incoming NC State military affiliated students and their families regardless of academic major, desired career path, or class standing (freshman, transfer, or graduate). This program has proven successful in assisting our military affiliated students with their transition into the Wolfpack community.

This year's event will highlight an introduction to university and community resources, a tailored campus tour, early registration to our fall events, community building, and an introduction Student Veterans Association. Look out for an email with instructions on how to register.

Priority Registration

NC STATE UNIVERSITY

RESOURCES ☰ search ncsu.edu

Enrollment Management and Services →

Registration and Records

Non-Degree Studies | Veterans Education | Classrooms and Scheduling | Reports and Security | Help/FAQ

NC State GI Bill Users Awarded Priority Registration

March 13, 2017 | Registration and Records

March 10, 2017: Beginning Fall 2017, undergraduate students enrolled in a degree-seeking program who are using GI bill benefits will be able to register at the top of their class. Offering Priority Registration for students using GI Bill benefits has been a goal of the university for the past few years, and falls in line with the universities mission of being a top-tier Military and Veterans Friendly Campus.

Undergraduate degree seeking students using GI Bill benefits will now receive a priority registration date within their designated class.

The Office of Registration and Records granted the priority to provide students who are typically challenged by a time requirement to graduate, greater access and flexibility to register for courses.

Provide assistance to qualify for in-state tuition (public institutions)

MILITARY RESIDENCY INFORMATION

Think you qualify for in-state tuition under one of the military residency provisions?

- ☐ I am active duty military or a dependent of an active duty military person either stationed in South Carolina or who has South Carolina as their home of record.
- ☐ I am a veteran or the dependent of a veteran. Veteran must have been active duty within the last three years and student must qualify for and use either Chapter 30 or 33 benefits while a student.

Please complete the information below and return to the Office of Financial Aid-Residency, G-01 Sikes Hall. Additional information can be found online at *www.clemson.edu/financial-aid/residency/military-residency-requirements.html* or email Anna Lewis (military residency coordinator) at *at8@clemson.edu*.

Name: _____ CUID: _____

Email: _____ Enrollment date: _____

Align Tuition Payments to GI Bill

Pay by GI Bill (Veterans Education Payment Plan)

Due to delays that might occur in the processing of Veterans Education student benefit payments, NC State offers veterans, and other eligible students a Payment Deferment Plan.

Payment Deferred – 4 Month Plan

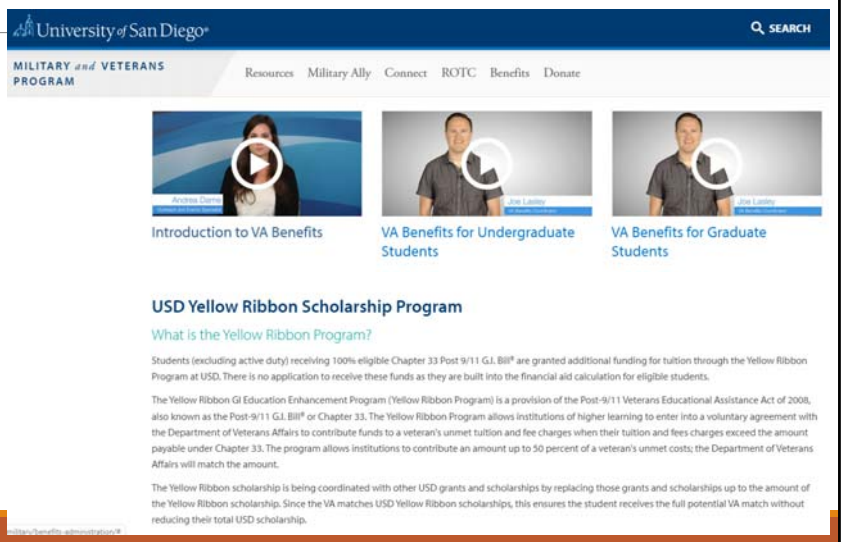
Designed to coincide with the VA release of Post-9/11 Tuition and Fee payments and student Monthly Education Benefit stipends, view the schedule below:

Fall Payment Schedule	Spring Payment Schedule
September 15	February 15
October 15	March 15
November 15	April 15
December 15	May 15

The cost of this plan is $24 per semester or $33 for an Annual 2-term plan.

Yellow Ribbon Program

- For GI Bill users
- Veterans Administration Matches Yellow Ribbon Program from University
- Results in meeting more student financial need



The Yellow Ribbon Program helps cover expenses beyond the GI Bill. This is particularly useful at private universities where tuition costs typically exceed public university tuition. A 2016 law requires public institutions to charge in-state tuition to all veterans using GI bill who meet other requirements (e.g., use benefits within 3 years of separation), but those that don't meet the other requirements can also apply for Yellow Ribbon benefits.

Other Promising Practices

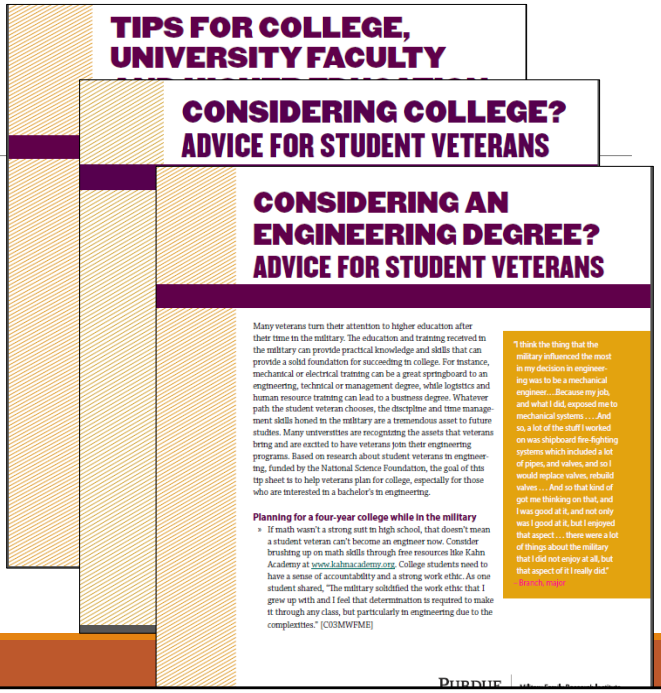
Pre-enrollment advising:

- "**From the moment I was enrolled here, I had people from the veterans department contacting me and giving me information**. They had a meeting first thing on orientation to give us more information and make sure that we were taken care of. On the counseling side of it, … I have three of them here… one for the university, one for the engineering college, and then my specific one for the ME department, is a veteran himself, which they assigned because they knew I was a veteran student." (*Navy, ME*)
- Rather than: "I think what would be beneficial is when anybody registers come here college there's an option that says like, 'Oh, are you a veteran?' or, 'Are you active duty?' **I feel like not only should your advisor contact you once you get accepted to college but a representative of the Veterans Affairs Office should contact you** as well saying, 'Hey, you need to do this, and this, and this before, oh, two weeks before class starts.'" (*Navy, NE*)

Veteran specialists in various administrative offices (e.g., admissions, housing, counseling services)

Tip Sheets

- We partnered with Purdue's Military and Family Institute (MFRI)
- Advice for Faculty Supporting Student Veterans
- Advice for Student Veterans Considering College
- Advice for Student Veterans Considering Engineering



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