Elevating Veterans with Disabilities: Case Study of STEM Transition Programs

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Agenda

1. Introduction
2. Accommodations and supports
3. Activity 1
   - ELeVATE case study
4. Activity 2
   - AIM case study
5. Activities 3 & 4
6. Summary & Q&A
About Human Engineering Research Laboratories (HERL)
WHAT WE DO

RESEARCH
- MISSION
- SCOPE
- PARTNERSHIPS

ADVOCACY
- STUDENTS FOR DISABILITY ADVOCACY & STUDENT VETERANS OF AMERICA GROUPS
- OUTREACH

EDUCATION, OUTREACH, DIVERSITY
- 4 STAFF; 3 FACULTY ACROSS 2 UNIVERSITIES IMPLEMENT 10+ PROGRAMS
  - STUDENTS: K-12, UNDERGRADUATES
  - CONTINUING EDUCATION: TEACHERS, HEALTHCARE PROFESSIONALS
  - SERVICE MEMBERS & VETERANS: VOCATIONAL TRAINING, ACADEMIC PREPARATION

WHAT WE DO
OIF & OEF VETERANS:

• unique population – unique set of needs
• over 2 million service members deployed in Iraq and Afghanistan
• 52% of service members are 20-29 years old
• wounded & injured in OEF/OIF: over 45,000
• POTSD: 40% of OIF/OEF veterans
VETERANS’ TRANSITION

45,000 community-based organizations & 10,000 websites to help vets & their families transition and integrate (Henry Jackson foundation, 2014)

results in confusion and may unintentionally add confusion to decision making

multiple pathways
- employment
- government
- non-profit
- private industry
- self (entrepreneurship)
- college

despite options, transition difficulties remain at 61%
Current State of Transition

- transition process not well understood
- non-traditional students – unique needs
- disability presents additional challenge
- vets with physical disabilities: 33% higher education institutions offer special programs
- vets with invisible disabilities: 23% institutions have programs
  - example: TBI
    - the VA has treated 8,000 brain injuries in the TBI population
    - effects of TBI on academic and professional experiences
- lack of knowledge and expertise from faculty, staff, other students
LACK OF DATA $\rightarrow$ NEED FOR EMERGING RESEARCH & PROGRAMS

$23.7$ billion has been invested in post-9/11 benefits since 2009

1 million veterans, service members, and their families have used GI bill since 2009

VA, national student clearinghouse, and SVA partnership

- completion rates
- drop-out rates
- transfer rates

effective programs and services to empower veterans to graduate and earn credentials
Large Scale Disability Data

- Service-connected disability rating
- Research studies
  - lower academic results and lower confidence in their academic abilities
  - education and training programs, alongside effective vocational rehabilitation, may significantly assist in positive employment outcomes
  - complete college at a statistically significant lower rate
  - persistently lower rate of employment irrespective of the level of degree attainment
- FOIA request
Accommodations and Supports
What is a Disability?

Under the Americans with Disabilities Act (ADA), an individual with a disability is a person who:

1. has a physical or mental impairment that substantially limits one or more major life activities; or
2. has a record of such an impairment; or
3. is regarded as having such an impairment.
The best accommodations are unique to the individual and develop from a cooperative relationship between the faculty member, the student and sometimes the Disability Resource Services (DRS).

In order to explore the best accommodations, the strategies for inclusion can be divided into 3 sections:

1. disability type
2. academic activity and
3. universal design.
## Disability Type

### OIF/OEF VWD disability type breakdown:

<table>
<thead>
<tr>
<th>Diagnoses</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musculoskeletal ailments</td>
<td>659,649</td>
<td>60.5%</td>
</tr>
<tr>
<td>Mental disorders</td>
<td>615,922</td>
<td>56.5%</td>
</tr>
<tr>
<td>Symptoms, signs, and ill-defined conditions</td>
<td>615,064</td>
<td>56.4%</td>
</tr>
</tbody>
</table>

A Veteran can have more than one diagnosis. A disability may or may not affect the participation of a student in a class. In postsecondary settings students are the best source of information regarding their special needs.
Students are responsible for disclosing disability and requesting accommodations. 

Instructors should include a statement on their class syllabus inviting students who require accommodations to meet with them.

Flexibility and effective communication between student and instructor are key in approaching accommodations.

Students with similar disabilities may require different accommodations.
Learning Disabilities (LD) are documented disabilities that may affect:

- Reading
- Processing information
- Remembering
- Calculating
- Spatial abilities
Cognitive Impairments

- Attention Deficit Hyperactivity Disorder
- Traumatic Brain Injury
- Genetic disorders
  - Downs Syndrome
  - Autism
  - Dementia
Learning Disability Accommodations

- Note-takers and/or recorded class sessions, captioned films
- Extra exam time, alternative testing arrangements
- Visual, oral, and tactile instructional demonstrations
- Computer with speech output, spellchecker, and grammar checker
Mobility Impairments may make walking, sitting, bending, carrying, or using fingers, hands or arms difficult or impossible.

Typical accommodations include:

- Note-taker, lab assistant, group lab assignments
- Classrooms, labs, and field trips in accessible locations
- Adjustable tables, lab equipment located within reach
- Class assignments made available in electronic format
- Computer with specialized input (e.g., speech, alternative keyboard)
Chronic illness/health impairments may affect daily living and involve the lungs, kidneys, heart, liver, immune systems, and other body parts.

Typical accommodations include:

- Note-taker or copy of another student's notes
- Flexible attendance requirements and extra exam time
- Assignments in electronic format, email communication
Mental illness includes mental health and psychiatric disorders that affect daily living.

Examples of accommodations for students with these conditions include:

- Note-taker, copy of another student’s notes, or recording of lectures
- Extended time on assignments and tests
- A non-distracting, quiet setting for assignments and tests
Examples of accommodations for students who are deaf, hard of hearing, or who have an auditory processing disorder include:

- Interpreter, real-time captioning, FM system, notetaker
- Open or closed-captioned films, visual aids, written assignments
- Preferential seating & elimination of unnecessary background noise
Blindness/Low Vision: refers to students who either have no functional vision or have some usable vision, but cannot read standard-size text.

Typical accommodations include:

- Electronic or braille books/notes, computers with screen readers
- Talking equipment, verbal description, tactile models
- Seating near front of class, large print handouts
- Computer equipped to enlarge screen characters and images
Academic Accommodation Guidelines

Students are required to have appropriate documentation of their disabilities and, typically, register with the Disability Resource Services (DRS) when seeking academic accommodations.

Accommodations often vary by academic activity and some students may need multiple accommodations to meet requirements.
Although accommodations vary based on student needs, course content, information, resources, and physical facilities, it is useful to be aware of typical accommodation strategies.

With this basic knowledge you will be better prepared to guide students and to discuss accommodation requests with other instructors and DRS staff.

The following slides give examples of accommodations for students in different academic activities.
Large Lectures

General teaching strategies beneficial for all students include:

• Clear and well organized class outlines and visual aids
• Clear descriptions of visual aids
• The availability of course materials before each class
• Availability of course materials electronically
• Opportunities to ask questions electronically via e-mail
Some general teaching strategies that benefit all students include:

- Establish clear ground rules for discussion
- Provide electronic supplementary course/discussion materials
- Give clear descriptions of visual materials
- Paraphrase questions and answers and highlight key points throughout discussions
- Create options for electronic discussions
Test Taking

Typical accommodations include:

- Alternative, quiet testing locations and distraction free rooms
- Alternate formats (e.g., oral presentations, projects, essay instead of multiple choice; written paper instead of oral presentation)
- Well-organized tests with concise instructions.
- Alternative test formats (e.g., computer, presentations, take-home open-book or demonstration of skills)
- Extended test-taking time, reading or scribe services
Field Work

Examples of fieldwork accommodations that apply to students with a variety of disabilities include:

- Fieldwork sites in accessible locations
- Accessible transportation to and from the fieldwork location
- Access to disabled parking spaces
- Printed material in large print, Braille, electronic format
- Sign language interpreters, captioning, and/or TTY access
- Access to computer hardware and software
Science Labs

Typical accommodations include:

- Working closely with a lab partner or assistant to facilitate involvement in lab activity
- Assuring safety by going through a thorough lab orientation and necessary procedure adjustment, depending on the disability
- Have a plan established that may involve moving equipment, working from a specific location in the room, or involving another student as a back up in case of emergency
Computers & Electronic Resources

General Accommodation Strategies include:

1. Accessibility to the facility, materials, & electronic resources e.g. printers & websites
2. Personnel should be familiar with available Assistive Technology and be aware of disability issues
3. Websites are accessible and designed in a manner that allow for independent navigation
Design & Art

Typical accommodations include:

- Work environments that are wheelchair accessible (e.g., adjustable workstations, spaces that are free of clutter, tools and supplies stored within reach)
- Being allowed extra time and/or assistance to set up materials
- Flexibility in assignment requirements and deadlines
Universal Design (UD)

UD Definition:

According to the Center for Universal Design, "is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design."

It takes into consideration the variety of abilities, disabilities, racial/ethnic backgrounds and other characteristics of the student body.

Universally designed learning environments are created to be accessible to everyone from the beginning.
Universal Design

Additional benefits of UD include:

- Sidewalk curb cuts, designed to make sidewalks and streets accessible to those using wheelchairs, are today more often used by kids on skateboards, parents with baby strollers, and delivery staff with rolling carts.
- Captioned television displays in airports and restaurants benefit people who cannot hear the audio because of a noisy environment as well as those who are deaf.
Supports

Veterans Service Office

Disability Services Office

Department of Veterans Affairs
  • Vocational Rehabilitation

Veteran Service Organizations

Peers
  • Student Veterans of America

Transition Programs
Questions?
Poll

- http://etc.ch/fkle
Activity 1: Poll

• In your role of Veteran Program Administrator (or sub as relevant!) have you used, or were you aware of, any of the described accommodations and/or supports?
  ▪ If yes, please describe the situation where they were useful.
  ▪ If no, what was new for you and how may you apply this knowledge? With whom would you share it?

Please share your response on the poll.
Experiential Learning for Veterans in Assistive Technology & Engineering (ELeVATE)

Case Study
Video: In Veterans’ Words…
# Why College & Stem

### Benefits for veterans
- Empowerment through education
- Using skills acquired in the military
- Employment

### Benefits for society
- Diversity in postsecondary education and workforce
- Global competition
- Stem enrollment at an all-time low
Recommendations for Vets Transitioning into Stem*

- Build early awareness of STEM careers and the pathways that lead to them
- Ensure academic recognition of service members’ prior experience
- Define and propagate supportive academic environments
- Provide seamless support from government agencies, academic institutions, and industry

*Derived from NSF “Transitioning Veterans to Engineering Related Careers”
WHAT CAN BE DONE?
ELeVATE GOALS

Provide supplemental assistance to veterans transitioning to postsecondary institutions

Educate faculty and college administrators about student veterans’ needs

Demonstrate that programs designed specifically for student veterans are effective at promoting their academic and career success

Be a model for veterans transition programs
Program Design

• Inspired by the research experience for undergrads program
  ▪ Logistics

• Mentoring
  ▪ Faculty
  ▪ Graduate student
  ▪ Community mentor
  ▪ Cross-mentoring opportunities

• Academic preparation
• Professional development
• Vocational rehabilitation
# Academic Preparation

<table>
<thead>
<tr>
<th>Math seminar</th>
<th>Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 5 hours/week</td>
<td>• 3 hours/ week</td>
</tr>
<tr>
<td>• Algebra, pre-calculus, calculus, statistics</td>
<td>• Online and in-person sessions</td>
</tr>
<tr>
<td>• Individualized approach</td>
<td>• Individualized approach</td>
</tr>
<tr>
<td>• One-on-one</td>
<td></td>
</tr>
</tbody>
</table>
Professional Development

**Essential skills workshops**
- Intro to assistive technology, research methods, good design practices, competitive adaptive sports, intro to orthotics and prosthetics

**Professional development**
- Career panel, networking opportunities, resume writing
- Content inspired by students’ needs
  - Applying to college, GI bill benefits, resilience training

Content inspired by students’ needs
WHY ELeVATE?

My graduate student mentor helped put me in the right frame-of-mind for returning to school as a full-time student.

- Nate B., US Army

Another point of enjoyment for me was helping my fellow veterans with their projects; math, writing or anything else.

- Gary R., US Army

I enthusiastically recommend this program to any veteran who is interested in engineering, research, or just something to open their mind, eyes, and heart to those with disabilities.

- Matt H., USMC

With all the veterans returning home, this program has a deeper meaning to me as it should for any veteran.

- Michael M., US Army

I found the program to be extremely beneficial, not only in aiding me in my studies, but also gathering connections with people in the local universities.

- Jon E., US Army
**Students**

- 5 cohorts
- 29 participants
- 100% satisfaction
- 17 enrolled in postsecondary programs
- 100% maintain stem-related career goals
- 3 enrolled in graduate programs (medicine, pharmacy, rehabilitation counseling)
- 9 participants continued to work on their projects upon completion of the 10-week summer experience

**Program**

- Training materials for vets
- Training materials for mentors
- Renewed funding from the NSF
- New programs: rev-t & aim

**Program Outcomes**
Impact on Participants

<table>
<thead>
<tr>
<th>ELEMENT RATED</th>
<th>AVERAGE RATING</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average confidence in ability to achieve academic goals</td>
<td>3.4</td>
<td>Scale: 0 (not at all) to 4 (extremely)</td>
</tr>
<tr>
<td>Average rating of how much ELeVATE program contributed to academic success in past term</td>
<td>2.3</td>
<td>Scale: 0 (not at all) to 4 (extremely)</td>
</tr>
<tr>
<td>Average rating of success in STEM related work experience</td>
<td>2.0</td>
<td>Scale: 0 (not at all) to 4 (extremely)</td>
</tr>
<tr>
<td>Average rating of how much ELeVATE program contributed to success in recent STEM work experience</td>
<td>2.0</td>
<td>Scale: 0 (not at all) to 4 (extremely)</td>
</tr>
</tbody>
</table>

- MATH WORKSHOPS, VOCATIONAL COUNSELING, AND RESEARCH EXPERIENCE WERE RATED MOST HELPFUL PROGRAM COMPONENTS
Deciding to take part in ELeVATE was the best decision I could have made.
- Adam C., US Army

ELeVATE provided me an exceptional opportunity to meet and work with inspiring, intelligent people who guided and motivated me to gain valuable experience.
- Shawn O., USMC

The Brotherhood that we shared in the military is here, trying to help veterans and all people with disabilities.
- Michael M., US Army

ELeVATE offered me an opportunity to experience many things I would not have on my own.
- Nicolette M., US Army

I simply want to thank Pitt for partnering with the VA to afford me the opportunity to become greater.
- Keniel M., US Army
Students' Rating of the Helpfulness of Aspects of Rehabilitation / Transition Planning

* Items - indicate that one student reported "Did not do"

- Learning about available support services: 2.75
- Developing a written career plan*: 2.00
- Developing self-management strategies*: 2.00
- Learning about accommodations / modifications (e.g. extended test taking time): 2.00
- Understanding my own strengths / challenges*: 1.67

Rating Scale: 0=Not at all, 1=Slightly, 2=Moderately, 3=Very, 4=Extremely
Mentoring Matters

Students' Reports of # of Meetings with Mentors and Helpfulness of the Mentoring

Helpfulness Rating Scale: 0 = not at all, 1 = slightly, 2 = moderately, 3 = very, 4 = extremely.
Disconnect on Peer Support

Rating Value of Peer Experience and Effectiveness of Self and Peers in Providing Support

- Value of being part of supportive peer group: 3
- Peers effective in providing support: 2.5
- Effective in supporting peers: 2.25

Rating Scale: 0=Not at all, 1=Slightly, 2=Moderately, 3=Very, 4=Extremely.
<table>
<thead>
<tr>
<th>UNIVERSITY OF TEXAS-ARLINGTON PROGRAM COMPONENT</th>
<th>AVAILABLE ENTIRELY AS PLANNED</th>
<th>AVAILABLE BUT DELAYED OR REDUCED INTENSITY</th>
<th>NOT AVAILABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer research experience</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly transition seminars</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Meetings with vocational coordinator</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Meetings with graduate student research mentor</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Meetings with Veteran mentor</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Meetings with faculty mentor</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Math workshops</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing workshops*</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research paper</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethics Forum</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Summary

• Data needed on veterans with disabilities completion rates in general, especially in STEM
• Case study suggests promising results with remaining questions
• Replication suggests promising implementation with moderate fidelity
• Customer discovery process suggests ELeVATE could be vehicle to support better retention of veterans with disabilities in stem disciplines
• ELeVATE & Beyond in development
Questions?
Poll

- [http://etc.ch/fkle](http://etc.ch/fkle)
Activity 2: Poll

- Transition program?
- Specific to vets with disabilities?
- Specific to academic discipline?
  - If yes, which discipline(s)?

Please share your response over the poll.
Advanced Inclusive Manufacturing (AIM)

Case Study
Poll

- http://etc.ch/fkle
Activity 3: Poll

- Does your institution have vocational training programs?
- Machining/manufacturing?

Please share your response over the poll.
AIM: aid in the transition of rehabilitating active-duty wounded warriors and rehabilitating Vets to potential careers in machining
Machining

- Employment need
- Skills/MOS match
- Apprenticeship
- Industry culture
Design Activities

- Rapid prototyping
- Welding shop
- Painting and finishing shop
- Stock storage and preparation
- Testing laboratory
- Electronics laboratory
- Technical computing laboratory
- Staffed by 5 full-time engineers & machinists
- Mentorship from multi-disciplinary faculty
Program Outcomes

*Students design, develop & evaluate their own products
*Students receive a certificate from HERL/Pitt

- NIMS Machining Level 1 exams
- On-the-job (OJT) training experiences
AIM Program Outline

Weeks 1-15: HERL

- Occupational competencies
- Knowledge, skills, abilities
- Self-efficacy building through vocational rehabilitation
- Other rehab coordination
AIM Weeks 15-21: OJT

- 40 hrs/week paid apprenticeship in the manufacturing field
- Meet with rehab counselors
- Apply and interview for full-time employment
- Attend career skills workshops
  - Resume writing, interview skills, time management, etc.
AIM: Occupational duties competency list

- Job planning and management
- Job execution
- Quality control and inspection
- Process adjustment and control
- General maintenance
- Industrial safety and environmental protection
- Career management and employment relations
AIM: Knowledge, skills, abilities

- Written and Oral Communications
- Mathematics
- Decision Making and Problem Solving
- Group Skills and Personal Qualities
- Engineering Drawings and Sketches
- Measurement
- Cutting Fluids and Coolants
AIM Results

• 14 PWDs completed program
  ▪ 93% male
  ▪ 36% were underrepresented ethnic minorities
  ▪ 64% were Veterans

• Participants indicate high level of:
  ▪ Interest in the subject matter
  ▪ Proficiency in AM skills and techniques
  ▪ Satisfaction with instructors
  ▪ Satisfaction with online Tooling U modules
AIM Outputs

• Training modules for education professionals working with PwDs in the machine shop environment
• Devices and technologies that improve machine shop accessibility for PwDs
• Machining curriculum that accommodates different learning styles/disability types
Questions?
Activity 4: Case Study

Read this case study scenario about a struggling veteran student.

Bill has both PTSD and a TBI as consequences of exposure to an IED while serving in the current conflict. Bill is in his first semester back at school. At first, Bill is struck by how different college life seems to anything he has experienced. He’s not used to a flexible schedule and other students don’t seem to take school as seriously as he does. Bill’s slight aggravations become more serious as the semester goes on and his grades start to suffer. He tries to talk to some of his faculty about the problems he is having in class, and not all are receptive, suggesting they have to treat all students the same, and refer Bill to student services (e.g., disability and/or veterans services) instead.

Apply what you have learned in this talk and in your own practice to address his needs. Please write down 3 suggestions and share with neighbor.
Conclusion

No one can take away what you can accomplish, especially when you set your mind on it.
- Keniel M., US Army

Need for more data (and subsequent interventions)

Support strategies have potential for significant impact on VWDs in training programs.

Support center personnel can help VWDs self-advocate and improve
• National Science Foundation, Project EEC 1036964
• Human Engineering Research Laboratories
• Rehabilitation Science and Technology, University of Pittsburgh
• Our partners at Veteran Service Organizations
• Our mentors
• Our student veterans
Additional Resource

- Coursera MOOC
- https://www.coursera.org/learn/disability-awareness
Campaign

- [https://engage.pitt.edu/iswp](https://engage.pitt.edu/iswp)

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International Society of Wheelchair Professionals

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[Facebook and Twitter logos]

Subaward No. APC-GM-0068
Questions?
• For thoughts, questions, & collaborations please contact Mary Goldberg at mgoldberg@pitt.edu