

Using Technology to Help Students with Traumatic Brain Injury Transition From College to Employment

Presenters:

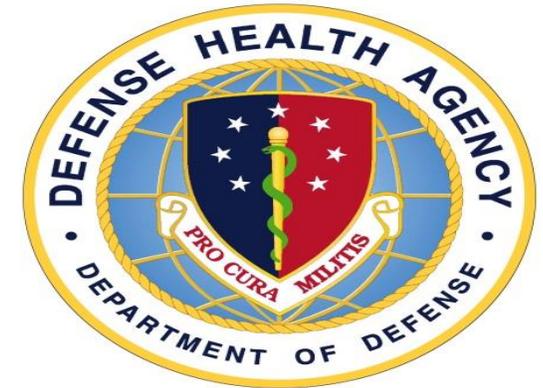
**Eileen Elias, Med, Philip Rumrill, Jr., PhD,CRC,
Deborah Hendricks, EdD**



DHA Vision



“A joint, integrated, premier system of health, supporting those who serve in the defense of our country.”



Disclosures



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Project Career: Using Technology to Help Veteran College Students with Traumatic Brain Injury Achieve Academic and Employment Success

Presenters:
Eileen Elias, MEd
Philip Rumrill, Jr., PhD, CRC
Deborah Hendricks, EdD

VA/DVBIC TBI Clinical Grand Rounds Meeting
March 25, 2016



"Medically Ready Force...Ready Medical Force"

Continuing Education Details



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Grand Rounds Learning Objectives



- Describe barriers veterans and civilians with traumatic brain injury (TBI) face in academic/higher education and work settings due to cognitive impairments.
- Identify how assistive technology helps compensate for cognitive impairments.
- Describe Project Career activities that support civilian and veteran student transitions from higher education to employment.
- Explain the Matching Person and Technology assessment tool that effectively matches individuals with TBI to cognitive support technology (e.g., Apps).
- Describe best practices and future research to improve effective delivery of vocational rehabilitation services for veteran and civilian students with TBI.

Presenter: Eileen Elias, Med



Director and Senior Policy Advisor, JBS International, Inc. North Bethesda, Maryland

Eileen Elias is an internationally recognized expert on disability-based healthcare reform and systems integration for all age groups, including civilians and service members. Ms. Elias is a public health consultant on disability. She directs the JBS International, Disability Services Center and is the organization’s mental health policy advisor. Disability groups include individuals with psychiatric disabilities, intellectual/developmental disabilities with behavioral disorders, traumatic brain injury, trauma, fetal alcohol spectrum disorders (FASD), and co-occurring disorders (i.e., intellectual/developmental disability and substance use disorders, chronic medical disorders). She is recognized for her effective work in mentoring graduate students and professionals.

Presenter: Phillip Rumrill, Ph.D., CRC



Professor and Coordinator,
Rehabilitation Counseling
Program, Director for
Disability Studies, Kent
State University, Kent Ohio

Dr. Rumrill, Professor and Coordinator of the Rehabilitation Counseling Program, is the Founding Director of Center for Disability Studies at Kent State University. He has received honors and recognition for his work from such organizations as the International Organization of Social Sciences and Behavioral Research, the National Association of Student Personnel Administrators, the National TRIO Foundation, and the National Federation of the Blind. He has held Distinguished Lecturer or Visiting Scholar appointments at the University of Pittsburgh, Ohio State University, the University of Leeds Medical School in England, the University of Glasgow in Scotland, and the Arla Institute of Finland. In 2005, Dr. Rumrill was named Rehabilitation Researcher of the Year by the National Council on Rehabilitation Education.

Presenter:. DJ Hendricks, Ed.D



Associate Director International
Center for Disability Studies for
Disability Studies
West Virginia University
Morgantown, West Virginia

DJ Hendricks, Ed.D.

DJ Hendricks is the Associate Director of the International Center for Disability Information (ICDI) at West Virginia University (WVU). She serves as the principal investigator for three projects: the Job Accommodation Network (JAN) funded by the U.S. Department of Labor’s Office of Disability Employment Policy, the WVU implementation site of Project Career as a subcontractor to Kent State University, and the Mobile Accommodation Tool funded by the National Institute on Disability, Independent Living, and Rehabilitation Research. Dr. Hendricks completed a BSS and MS in Statistics and an Ed.D. in Educational Psychology. Dr. Hendricks has worked at WVU for over 35 years and has been with the JAN project since its inception in 1983.

“Medically Ready Force...Ready Medical Force”

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National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR) – Project Career

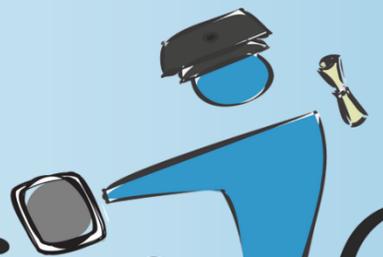
Development of an interprofessional demonstration to promote academic and employment success for veteran and civilian college students with TBI.



Cognitive Support Technologies



Vocational Rehabilitation



Project Career



Project Career

PROJECT CAREER

- Funded as a 5-year grant from September, 2013 through September, 2018

United States Health & Human Services
Administration for Community Living (ACL)
National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR)
#H133A130066

- Prime Contractor: Kent State University



- Additional sites:

- Boston University



- West Virginia University



- Partnered with JBS International for evaluation and dissemination



PROJECT CAREER

- Recruits and serves annually 10 new undergraduate students who have experienced a TBI from 2-year and 4-year institutions of higher education.
- Continuously serves students following graduation and job placement.
- Provides periodic student evaluations using a series of measurement instruments to determine cognitive and other limitations due to TBI, technology confidence levels, and educational and employment goals and plans.

Who?

Project Career Team

Philip Rumrill, Jr., PhD, CRC
Project Director, Kent State University

Callista Stauffer, MEd
Technology and Employment Coordinator, Kent State University

Eileen Elias, MEd
Assessment and Technology Manager, JBS International

Anne Leopold, MSc
Assessment and Technology Expert, JBS International

Deborah Hendricks, Ed.D.
Site Manager, West Virginia University

Elaine Sampson, MS, CRC
Technology and Employment Coordinator, West Virginia University

Karen Jacobs, Ed.D. OTR/L
Site Manager, Boston University

Amanda Nardone, BS, OTS
Technology and Employment Coordinator, Boston University

Subject Matter Experts

Marcia Scherer, PhD, MPH, FACRM
Assistive Technology Training Consultant, University of Rochester Physical Medicine and Rehabilitation

Joseph Cannelongo, MA, LPC, CRC
Vocational Services Consultant, Advocare Incorporated

Brian McMahon, PhD, CRC, CCM, NCC
External Evaluator,
Virginia Commonwealth University Medical Center

Advisory Board Members

Rick Briggs, Valerie Fletcher, Robert Fraser, John Kemp, Allie Murie, Theresa Rankin, Marilyn Spivack, and Matthew Turk



Impact of TBI on Civilians

- TBI is a serious US public health problem.
- ~ 1.7 million American civilians sustain a TBI annually.⁷



Impact of TBI on Veterans

- Department of Defense reports
 - Nearly 340,000 service members sustained a traumatic brain injury (TBI) between 2000 and 2015 with 82.5 percent of these classified as mild TBI, also known as concussion.⁵

Impact of TBI

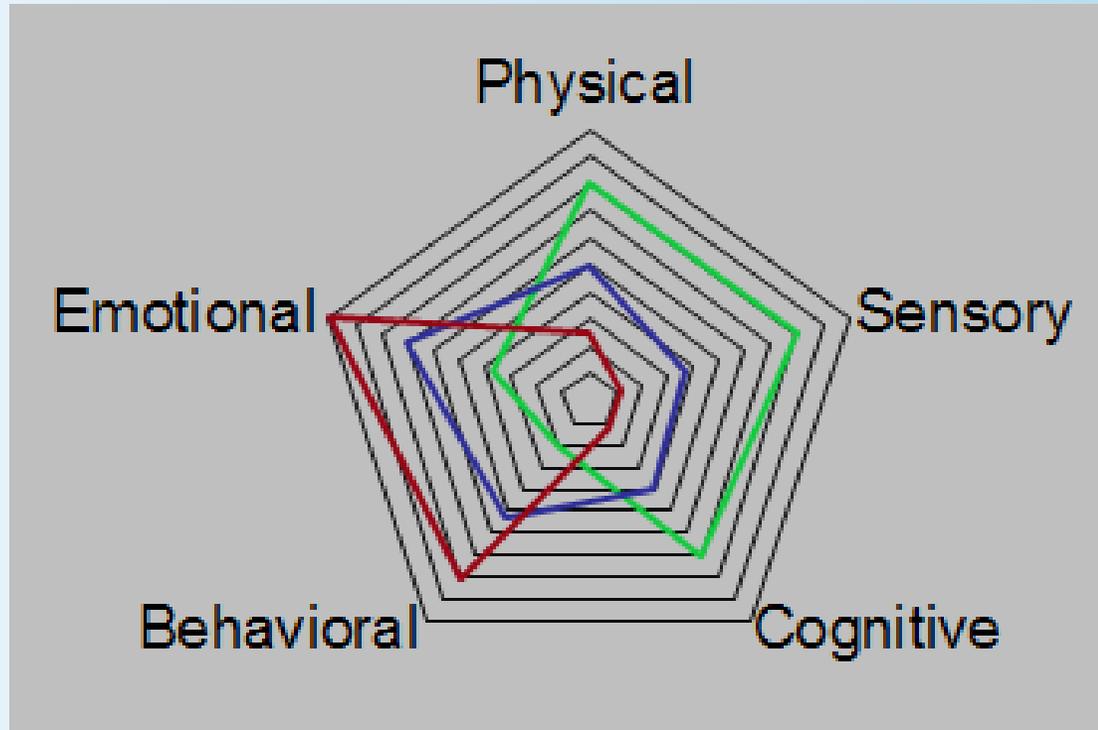
- TBI severity is commonly described as mild, moderate, or severe.
- A TBI can result from falls, motor vehicle crashes, assaults, blasts/explosions, sports, etc.
- TBI is a leading cause of death and lifelong cognitive disability among Americans under the age of 45.¹

Impact of TBI (cont'd)

- Post-traumatic stress symptoms and age could be used to predict overall outcomes from military blast concussions.⁹
- Long-term effects of TBI on cognitive performance reduction is associated to some extent with the initial injury.⁴
- Mild TBI can have long-lasting cognitive effects that impair the ability to work and engage in usual activities.¹²
- A cognitive deficit can be observed in individuals with a mild TBI even one year after the injury.⁴

TBI Symptoms

- No two brain injuries are alike.
- A TBI can affect:



Problems Due to TBI

- Cognitive
 - Delayed processing of information
 - Difficulty concentrating, focusing, comprehending, decision making
 - Difficulty with reading, writing, speaking
 - Difficulty with time management
 - Forgetful/Poor memory
 - Short attention span

Problems Due to TBI (cont'd)

- Emotional
 - Agitation/Irritability/Anxiety
 - Depression/PTSD
 - Frustration
 - Impulsivity
 - Lack of motivation/self-confidence

Problems Due to TBI (cont'd)

- Physical
 - Chronic pain
 - Decreased sensation; difficulty with gait, tremors, leg weakness
 - Fatigue
 - Headaches, migraines
 - Hearing loss
 - Sensitive to noise or light
 - Speech problems, stuttering, slurring
 - Vision problems, blindness

Recovery from TBI



Recovery to pre-injury levels varies by individual:

- Service needs vary for each individual and changes throughout the lifespan.
- Initial recovery focuses on physical and medical needs.
- Limitations in communication, cognitive, and emotional domains often remain.^{4, 10}
- As identified in a study done by Dikmen et al., recovery to pre-injury levels for individuals with a moderate to severe TBI can range from 65% of cases in personal care to approximately 40% in cognitive competency, major activity, and leisure and recreation.⁶

Recovery from TBI (cont'd)

Recovery may be long-term:

- Individuals often continue to exhibit residual cognitive and interpersonal challenges.
- Provision of regular and continuous rehabilitation services and supports are essential.
- Environmental factors can present barriers.

Impact of TBI on Higher Education Goals

Higher Education Challenges Due to TBI

Challenges include:

- Physical, cognitive and emotional issues.
- Changes in career aspirations.
- Reduced prospects for higher education.
- Community living choices.

Higher Education and Employment Challenges Due to TBI

- Disparities in academic outcomes.
- Lower grades and higher dropout rates.
- Difficulty in attaining and keeping employment:
 - 62% employed at time of injury.⁸
 - 31% employed 1 year after injury.⁸
 - 75% lost jobs within 90 days of placement when without adequate supports.¹¹

Higher Education Difficulties: Choosing and Using Technology

- Difficulties matching student needs with technology.
- Bewildering array of technology options due to complexity of devices.
- Fragmented information and service systems.
- Limited understanding of available resources and options.
- Decision making on devices can be complex and involves compromises.
- Lack of follow-up and training on technology use.

Higher Education Student Difficulties

- Academic challenges due to cognitive and psychosocial problems.
- Transition challenges from college to employment.
- 80% of students with TBI reported problems performing in the academic settings.⁸
 - Less than half reported using campus disability services and only 20% reported being aware of community support services.⁸
- Veteran students who have a TBI were less likely than civilian students to request classroom accommodations.²

How Supports and Services for Students with TBI Impact Employment Outcomes ¹³

- Bachelor's degree or higher = increased employment.
- Receiving SSI/SSDI = 49% less likely to attain employment.
- Job placement services = 2.55 times more likely to attain employment.
- On-the-job supports = 2.25 times more likely to maintain employment.
- Job search services = 1.45 times more likely attain employment.
- Occupational/vocational training services = 1.39 times more likely to attain employment.
- Information/referral services = 1.38 times more likely to attain employment.

Veteran and Civilian Students

At Project Career's onset, we found that many veteran and civilian students:

- Were not using college support services.
- Lacked continuing supports in preparing for college graduation.
- Were unsure how to use/benefit from technology to perform academic and job assignments.
- Experienced lack of understanding on how employers can accommodate individuals with a TBI.

What is Project Career Doing to Address Challenges?



Identifying the problems and applying what we know – **best practices** ...

Identified Key Barriers

- Two of the most prominent barriers reported by Project Career civilian and veteran students with TBI are:
 - Limited access to individualized supports to help overcome cognitive and academic limitations; and
 - Lack of career-related services to prepare for and maintain employment.

How Project Career Addresses Student Barriers

- Project provides an iPad along with apps custom-selected to address each student's cognitive needs.
- Project's Technology and Employment Coordinators (TECs) provide continuous support.
- TECs address hesitancy to use technology by providing training on use of the iPad and each selected app.
- TECs provide re-evaluations each semester to determine students' functioning changes and additional app needs.

Vocational Rehabilitation Best Practices

- Individualized Case Management.
- Individualized employment planning.
- Vocational goals and services to achieve goals.
- Comprehensive individualized services including:
 - Information and referral;
 - Assessments;
 - Counseling and guidance;
 - Vocational training or other post-secondary education; and
 - Supports for job search, placement, coaching, supported employment, developing employer relationships, and addressing job-related challenges

Technology and Employment Coordinators (TECs)

- Each TEC provides one-on-one individualized vocational rehabilitation services by:
 - Assessing and providing technology to improve academic performance
 - Communicating through face-to-face meetings, emails, and electronic applications (e.g., FaceTime)
 - Working with on campus veteran programs and student accessibility services.
 - Providing academic peer tutors
 - Locating and securing internships
 - Recruiting and linking with chosen specialty mentors.
 - Building resiliency
 - Maintaining relationships with local rehabilitation, disability, and medical resources.
 - Support and advise on employment search
 - Monitoring supports after employment is obtained

**A successful outcome begins early by choosing the most appropriate technology for the student.
How we accomplish this?**

What is Assistive Technology?¹⁴

- **Assistive technology (AT)**
 - Generally defined internationally as: Any item, piece of equipment or product system(s), whether acquired commercially, off the shelf, modified or customized, that is used to increase, maintain or improve functional capabilities of individuals with disabilities.
- **Cognitive Support Technologies (CSTs)**
 - Class of AT designed to help with cognitive functioning - memory, attention, concentration, planning, etc.

Assess Individual Factors

All but the simplest technology requires an evaluation early in the process of selecting interventions and devices.



Photo Source: Fort Hood Sentinel

Matching Person and Technology Assessment Tool¹⁴

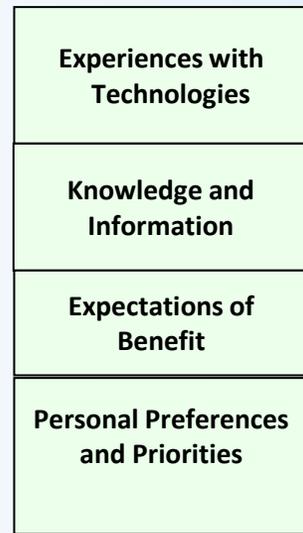
- Provides for individualized biopsychosocial functional assessment and reassessment.
- Effectively matches student with TBI to most appropriate cognitive support technology (app).
- Identifies changes in functional needs that may require adaptation of the provided technology.

Matching Person and Technology (MPT) Assessment Tool³

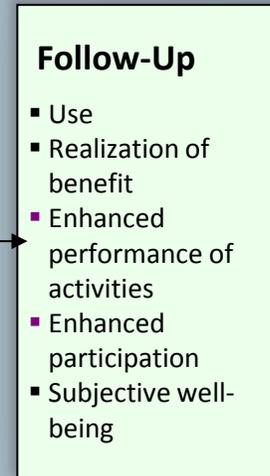
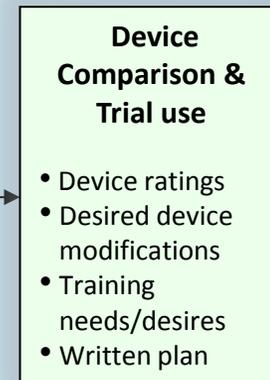
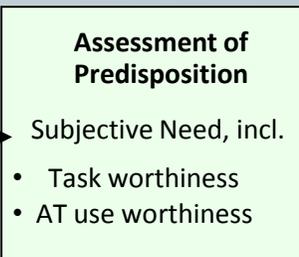
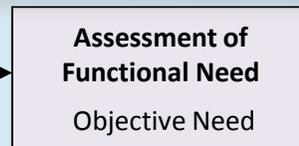
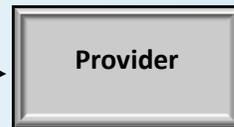
Environmental Factors

- Availability of Products
- Affordability of Products
- Availability of appropriate professionals
- Opportunities and services
- Social and Economic Priorities
- Legislation & Laws
- Attitudes of Family/Friends & Key Others
- Support from Family/Friends & Key Others

Personal Factors



Support Decision-Making & Selection



Cognitive Support Technologies¹⁴

- Specialized vs Universal



Universal devices are used by individuals with and without disabilities..

Assistive Technology Use¹⁴

Advantages of Everyday Technologies

- User appears like everyone else, even “cool” (doesn’t stigmatize the individual).
- Becoming less expensive, more advanced, and easier to use.
- Because they are cheaper than specialized technologies, they make an effective back-up or secondary device.

Disadvantages of Everyday Technologies

- They are most likely not paid for by public/private health insurances including Centers for Medicare & Medicaid Services (CMS) as not exclusive to medical needs.
- They are made for the “average user’ and not user with particular assistive needs.

How Project Career Works

Technology and Employment Coordinator

Comprehensive Assessment and Planning
Matching Person and Technology and Vocational Needs

Cognitive Support Technology
iPad and Apps

Case Management
Individualized Services & Supports

Training
and TA for
CST use

Mentoring

Internships

Accommodations
Seminar/Webinar

Post-Graduation
Support

Apps as Cognitive Support Technologies

Attention/Memory

- AudioNote
- Notability
- Voice Dream Reader



Planning/Organization

- Planner Plus
- iThoughts
- 30/30
- Week Calendar



Reminders

- Due
- Alarmed



Emotion/Stress

- Calm
- Breath2Relax



Apps as Cognitive Support Technologies (cont'd)

Fatigue/Sleep Problems

- Yoga
- Sleep Cycle



Difficulty with Speech, Reading, or Writing

- Read & Write
- FireFlyK3000



All Apps Available at iTunes
and Other App Stores

Self-Esteem/Confidence

- Elevate
- Clockwork Brain

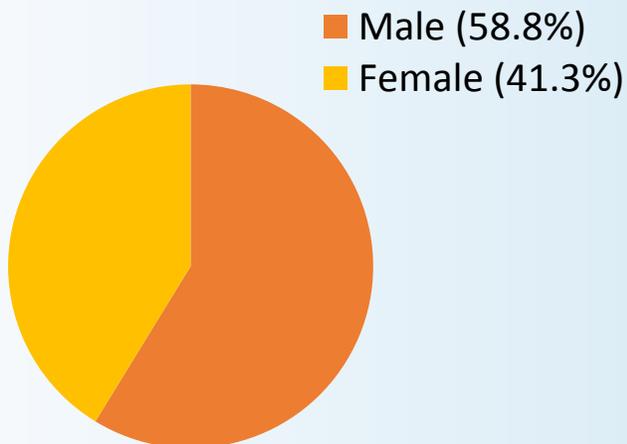


Project Career Participants

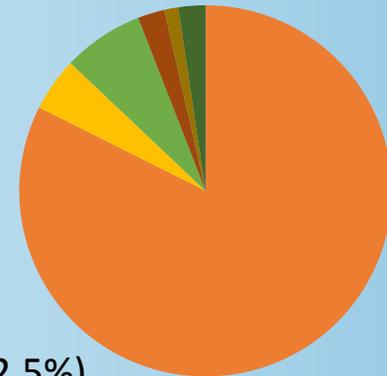
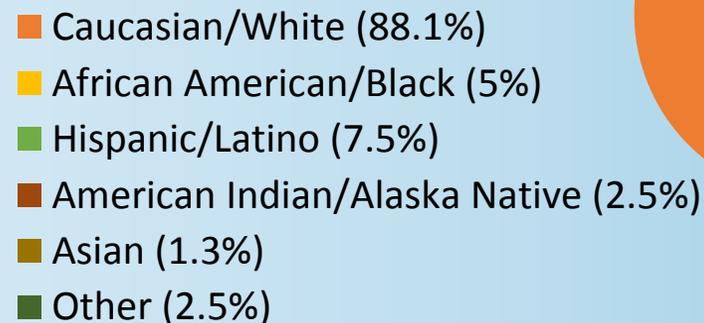
Student Profile Information: March 14, 2014 - February 6, 2016

- 80 Participants
 - 11 dropped out
 - 11 graduated and still receive services
- Age range: 18-52 (Mean=27)

Gender

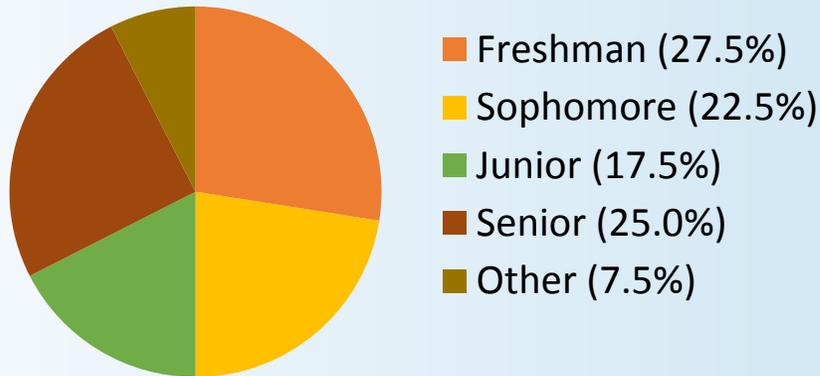


Race/Ethnicity



Student Participants: Characteristics

Year

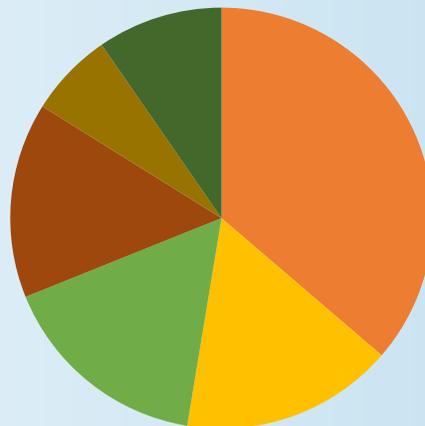


Full-time students: 68.8%

Year TBI incurred: 1981 – 2015

Served in the military: 23.8%

Cause of TBI



Students with a Military Background

Student participants who served in the military:

- Percentage who served in the military:
 - 23.8%
- Number of years served in the military:
 - 1-24 years
- Percentage by military branch:
 - Army-10%
 - Marines-8.8%
 - Navy-3.8%

Student Participants: Characteristics

▪ Service Supports Using

- Student Disability Services: 78.8%
- Veterans Administration: 21.3%
- Social Security Administration: 23.8%
- Mental Health/Substance Use: 17.5%
- Career Services: 21.3%

▪ Services participants may need

- Training and assistance with assistive technology: 93.5%
- Job development (for internship or job placement): 91.9%
- Obtain mentor: 91.9%
- Help with resume and cover letter: 91.9%
- Academic counseling: 82.3%
- Part-time/Summer employment assistance: 67.7%
- Assistance in understanding/using university system: 59.7%

Student Participants: Characteristics (cont'd)

▪ Type of Medical Insurance

- Private: 47.5%
- Medicaid: 30%
- Veteran Insurance: 21.3%
- Medicare: 12.5%
- Student Insurance through college/university: 5%

▪ Informal Support Systems Used

- Family: 85%
- Friends: 67.5%
- Significant Other: 33.8%
- Support Group: 28.7%
- Co-Worker: 20%
- Student Association: 17.5%
- Church: 14.5%
- Other: 36.3%

Student Participants: Trends to Date

- **Career Decision Self-Efficacy**

- On average, scores increased over time, suggesting an increase in participants' career decision self-efficacy.

- **Career Barriers**

- On average, there is a trend of scores for encountering barriers to increase over time and scores for barriers hindering career progress to decrease over time.

Student Participants: Trends to Date (cont'd)

- **Overall experiences with current technology uses**

- There is a significant difference in scores between baseline and follow up ($p=0.003$, $\eta^2=0.267$), indicating that participants have more positive overall experiences with technology use over time.

- **Perspectives on technology use**

- There is a significant difference in scores between baseline and follow up ($p=0.026$, $\eta^2=0.159$), indicating that participants have more positive perspectives on technologies over time.

- **Personal/social characteristics**

- There is a trend in scores decreasing over time indicating that participants indicate being more positive, independent, social over time.

Student Participants: Trends in App Use

- On a typical day, students use apps for about 2.05 hours.
- Students who report that they always, nearly always, or about half the time go out into the community with a specific app = 65.7%.
- Students who report that an app moderately or a lot:
 - Improves quality of life = 52.5%
 - Enhances comfort = 45.5%
 - Enhances well-being = 37.4%
 - Helps get around or go out with others = 15.2%
 - Helps perform academically = 71.7%
 - Helps take care of personal errands = 39.4%
 - Helps keep in touch with others = 18.2%
 - Helps take care of health = 17.2%
 - Helps be more active/involved in community = 16.2%

Student Participants: Reasons Why App Use Is Discontinued

- My needs changed.
- Change in academic program.
- Too inconvenient to use.

Veteran Student Participant's Insight

“I think the mentoring part of Project Career has been the most beneficial thing for me. Even though I have work experience and I've been in the Marines, I really did not know much about the field of computer science or anyone currently working in the field. My mentor talked with me on the phone for over two hours the first time and as a result, I completely changed the classes I'm taking this summer to better fit what I actually want to do for a career. If it wasn't for him, I would have wasted a lot of time on programming classes that wouldn't have ultimately helped me that much. I really encourage some of the younger students who may be more hesitant to work with an experienced mentor. My mentor has so much experience and has had a lot of different jobs so I feel like I'm learning a lot from him and now have a better sense of what I want to do.”

Future Research on Higher Education and Career Supports for Individuals with a TBI

- How do the experiences of veteran students compare and contrast with those of civilian students?
- Research on benefits of using universal cognitive support technologies in academic and work settings.
- Research on potential of a Student Technology Accommodations Resource (STAR) portal as a “clearinghouse” and review platform for apps as cognitive support technologies.
- Use of mentors/buddies in preparing for employment and within the work setting.

Project Career: Implications for DVBIC

- With the proper support, more veterans with a TBI can achieve academic success
 - A tablet or laptop computer partnered with an individualized set of apps can provide cognitive support technology ongoing supports.
 - A case management approach involving one-on-one counseling with academic tutoring and vocational rehabilitation in conjunction with other support services are essential to academic success and career goal attainment.
 - An electronic one stop resource portal containing an array of information addressing needs and challenges available to all military stakeholders.

References

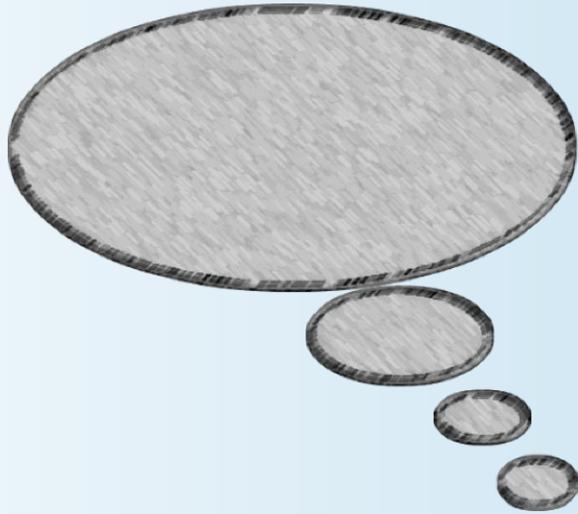
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- ⁸ Kennedy MRT, Krause MO, Turksta LS. An electronic survey about college experience after traumatic brain injury. *NeuroRehabilitation* . 2008;23:511-520.
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Questions & Thoughts

Contact Information



Eileen Elias

240-645-4534

eelias@jbsinternational.com

Phil Rumrill

330-672-0600

prumrill@kent.edu

Deborah Hendricks

304-293-7186

Hendricks@jan.wvu.edu

DVBIC Contact Information



Mrs. Brenda Stidham, BSN, RN, MSPH, CRRN

Brenda.s.stidham.ctr@mail.mil

DVBIC General Mailbox: info@dvbic.org

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