IDSA

DESIGN AS A NON-TRADITIONAL THERAPY

ENGAGING VETERANS IN THE ID PROCESS AND INTRODUCTION TO POSITIVE TECHNOLOGIES

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PAPER ABSTRACT: Digital 3D modeling and fabrication tools are used in myriad sectors from education to industry, enabling ideation, prototyping, and even production. Given their wide application, can Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) be employed to support the transition from a military mindset to a student perspective, and eventually to a contributing member of society? Just one in five veteran students at Kean University successfully transitions to higher education, while the vast majority require support services throughout their academic tenure.

In addition to traditional counseling, the use of industrial design methodology, CAD and CAM, as positive technologies, can help with stress management. Veterans can benefit from design therapy – in other words, problem solving through digital modeling and fabrication. In this ongoing case study, design is a medium used to aid veteran students outside of the creative fields in stress management, academic continuity, and accomplishing career goals. The project is not intended to replace traditional therapy, but rather provide a new type of therapy. The long-term goal of the project is to introduce a remedy for those veterans who are at risk of being placed on probation or dismissed, where traditional methods of counseling are not working.

Keywords: Non-traditional therapy, digital fabrication, social design, 3D modeling, collaboration.

1. INTRODUCTION

The military provides instruction on day-to-day activities through clear, inflexible policies and procedures. After separation or discharge, culture shock is a common experience. Skills acquired in the military such as responsibility, communication, integrity, teamwork, problem solving, and technical specialization are all extremely valuable. However, there's also learned behavior like unquestioning obedience and accomplishing tasks based on mission objectives. Shifting the focus back to one's own self and assimilating into civil society can be much harder than it appears.

In addition to the typical challenges a student faces when embarking on their higher education, veterans face additional hurdles as they transition from soldier to student. As mentioned in the abstract, according to Kean University's Veterans Educational Transitional Services (V.E.T.S.), 80% of veteran students require additional support. The focus of this study is whether design therapy would keep veterans more engaged as students and complement existing conventional therapeutic methods. Would this extra layer of support generate enthusiasm and keep veterans motivated, increase academic

retention, and ultimately help veterans complete their higher education and achieve success in civilian life?
As an educational institution, the university plays an important role in the veteran transition process and looks at utilizing non-traditional support outside of the standard therapy sessions that Veterans Affairs (VA) provides. Kean University's V.E.T.S. Program works alongside the VA VITAL Program (Veterans Integration To Academic Leadership, 2021) on campus to assist the University's veteran population.

Veteran students have numerous triggers that can initiate PTSD. Sometimes these episodes lead to mental and physical harm. The V.E.T.S. office has seen several such cases, and has been working with several organizations to bring in Art as a medium to channel issues with PTSD and Traumatic Brain Injury (TBI). Art as therapy is a great option, however, it relies heavily on hard skills specialization, has a long learning curve, and depends on enthusiasm for a particular medium. Product design is distinct from fine arts. It's a continuous journey of iterative processes. It requires empathy, critical thinking, testing, revising and refinements, and soft and hard skills. The methodology inherent in product design is an ongoing process which demands sustained engagement over time, especially when positive technologies are introduced and utilized throughout the process. As background, positive technology derives from positive psychology, which "is the scientific study of optimal human functioning and flourishing. Instead of drawing on a "disease model" of human behavior, it focuses on factors that enable individuals and communities to thrive and build the best in life." (Riva et al., 2012)
The "'Positive Technology' approach--the scientific and applied approach to the use of technology for improving the quality of our personal experience through its structuring, augmentation, and/or replacement--[is] a way of framing a suitable object of study in the field of cyberpsychology and human-computer interaction. Specifically, we suggest that it is possible to use technology to influence three specific features of our experience--affective quality, engagement/actualization, and connectedness--that serve to promote adaptive behaviors and positive functioning." (Riva et al., 2012)

The design therapy project to introduce veterans to CAD and CAM was initially awarded in the 2018-2019 academic year by an internally funded application under the Quality First Initiative (QFI). The QFI grant is designed to provide funding for student success. Vito Zajda, Director of the Veterans' Office and Efe Kutuk, Assistant Professor & Program Coordinator of ID teamed up to think of additional ways to support veterans. The idea behind the Digital Fabrication Lab for veterans is to offer an outlet for any issues or stressors the veteran may be experiencing. The lab houses 3D Printers, Laser Cutters and CNC Routers, and features the support of ID faculty and student assistants on making veteran student designs come to fruition.

Given lack of access to digital fabrication facilities, the pandemic slowed the pace of certain deliverables in this project. However, progress was made on funding. This past fall a team of faculty including the director of the VA office at Kean University applied for a U.S. Department of Education grant. There

were around 400 applicants, and the grant proposal secured $447,971 to develop Centers of Excellence for Veteran Student Success.

2. LITERATURE REVIEW

In addition to individual endeavors of veterans engaging in 3D Printing; “Jesse, a war hero uses 3D printing to help with PTSD” (Robo3D, 2016; HatchBox, 2018), there have been several case studies about how 3D printing assistive devices and medical products helps veterans and patients in the VA hospitals and medical centers (Department of Veterans Affairs Blog, 2017, 2019). There is also the integration of 3D printers to local Veterans Affairs offices as a form of recreational therapy; “according to Andrea Ippolito the VA Innovators Network Lead at the VA Center for Innovation, a nationwide outreach program connecting veterans to entrepreneurial ideas. ‘[We are] providing new opportunities, new options, for veterans that are pursuing recreational therapy – a 21st century tool that they can use for everyday life or perhaps get a job,’ she explains. Last August, the VA Innovators Network hosted a six-week, 3-D printing boot camp in San Antonio, Texas. ‘Over 70-percent of the veterans that participated found employment in 3-D printing careers that had never had experience in 3-D printing before,’ Ippolito said.” (VPR, 2017) (Corrigan, 2019). There are even several organizations that train veterans for jobs in additive manufacturing and 3D printing (3DVeterans, 2021) (America Makes, 2021). Furthermore, collaborations are emerging between government entities and corporations that utilize additive manufacturing; “3D Systems will support the Veterans Health Administration as they establish FDA-compliant manufacturing facilities within their hospitals for the production of additively manufactured medical devices. As a result, the VA network will streamline its supply chain and accelerate innovation to enhance personalized care for their patients – U.S. Veterans.” (3DSystems,2021).

As shown in these examples, it’s clear that there are existing collaborations that introduce 3D printing to the veterans. However, based on a comprehensive search, there are no collaborations at the academic level that include industrial design students, faculty and veterans. This creates an opportunity to measure this project’s success and perhaps use it as a baseline template at other academic institutions.

3. METHODS & PROCESSES

The industrial design program under ID faculty guidance has been collaborating with the Veterans Office and veteran students for almost three years. Unfortunately, there’s insufficient data to measure veteran students’ success and retention rates since the collaboration is relatively new. The first cohort of veteran students are still enrolled.

Three different approaches have been introduced in terms of teaching and collaborating: lectures and demos, one on one reviews and teamwork. Thus far, all of the veteran students have been from non-ID majors, and none are in creative fields. After the design brief introduction and initial ideation, veterans have been assisted in using 3D modeling software and CAM platforms to create and fabricate their

designs. In some cases, assistive devices have been produced to help veterans regain freedom, if suffering from a physical injury.

3.1 THE BRIEF

At the beginning of the semester, veteran students are asked: “Based on your military experience, think of a product that would be beneficial to you and/or your peers. You can think of different stages of your experience - before, during, and after military service. Consider the period before serving - what sort of product would assist with the civilian to soldier transition? And during your time in the military, think of the moments when you said to yourself, if I had a product that performed this specific task, it would be very helpful. Finally, in your post service time, and cognizant of all the VA programs and support groups, what type of product would aid your peers in these programs? Please be mindful that we would like to work on positive experiences that will enhance quality of life. Products that can be used as a weapon or apparatus to a weapon will not be allowed.”

3.2 LECTURES & DEMOS

Taking into account veteran students’ limited knowledge of 3D modeling and digital fabrication, the initial lecture and workshop focuses on introductions to faculty and student assistants working in the digital fabrication lab, 3D modeling fundamentals, and navigating the software platform. A brief introduction is made to 3D modeling thinking, approach, and commands. The first demo session is done two weeks into the semester, providing veteran students time to get familiar with the software and begin thinking about projects that they would like to work on. In the second lecture, 3D model detailing skills are covered. A Q&A session is held to answer questions and troubleshoot issues, and a similar session is held during the seventh week of the semester. The last Q&A session is scheduled towards the end of the semester, during which files are reviewed for 3D printing feasibility. Additional support is available throughout the semester, with ID student assistants available to help veteran students on their project development and digital fabrication.

3.3 ONE ON ONE REVIEWS

These “extra help” sessions are held on a voluntary basis depending on the individual veteran students’ progress. In the initial meeting, contact information of the faculty leading the workshops and student assistants who are working in the digital fabrication lab are shared. Then, based on the student’s progress, individual sessions are scheduled.

These meetings are especially important considering the non-designer background of the veteran students. There’s a tendency toward frustration since they do not have a good command over the software and they are not familiar with design processes. Usually these sessions cover troubleshooting and refinement of the designs.

3.4 TEAMWORK

The most successful projects emerged when a (non-design major) veteran student teamed up with a junior level industrial design student. The project brief is explained at the beginning of the semester and after establishing the team, they have fifteen weeks to work on their idea. The brief is kept the same throughout the collaboration. Veteran students define the brief based on the established criteria, and the industrial design students help them ideate and visualize the product that they want to create. At a

later stage in the design development process, industrial design students took the lead and worked on the feasibility of the ideas. This phase of the project is a back-and-forth process between two teammates. ID students design and develop, and veteran students fact check.

3.5 TIMELINE
Fall ’18: Veteran students are invited to collaborate with ID Design Studio II students. Semester long interdisciplinary group project. Poster Presentation during Research Days, full presentation at the end of the semester.
Spring ’19: Lectures and one on one feedback to Veteran students in GE3000 Transition to Kean course
Fall ’19: Lectures and one on one feedback to Kean Veterans in GE3000 Transition to Kean course
Spring ’20: Lectures and one on one feedback to Kean Veterans in GE3000 Transition to Kean course
Fall ’20: Work on the Department of Education grant application and submission
Spring ’21: Notification of the grant acceptance and initial steps of peer institution collaborations

4. RESULTS

This collaborative project became part of a general education course required for all Kean University students to take for their degree requirements. The course is called General Education (GE) 3000 Transition to Kean. It is a one-credit course that provides the tools necessary to be a successful student. Four years ago, the university created a specific section for veterans. This supports the transition process, and a digital fabrication project is required as part of the course. In Fall’18 semester, a collaboration made with Professor Efe Kutuk‘s, ID Studio II course, and outcomes of the ID students and veterans collaboration were significant. One of these projects was supporting veterans who have prostheses issues. This main issue is the prostheses may not fit correctly due to a change in the veteran’s weight. Veteran students along with ID students, under the guidance of Professor Kutuk, created a device that would accommodate changes in body weight. The newly established Centers for Veteran Success will allow for additional support to those veterans who want to pursue their projects further. The next level would be working with corporations who may want to support or even patent their ideas.

4.1 EXAMPLES

- FLUX: AN ADJUSTABLE PROSTHETIC SOCK FOR RESIDUAL LIMB FLUCTUATIONS

“Amputations cause neurological and psychological trauma to the individual. This leads to conditions such as phantom limb syndrome where the brain’s primary somatosensory cortex is affected. Each time a fitting occurs, it causes physical and psychological pain to the amputee due to the over sensitization of the limb.” (Ciardullo, C. Reyes, E. Diaz, M. Gardner, Z. 2018)

Figure 1. Common Problems. Flux.

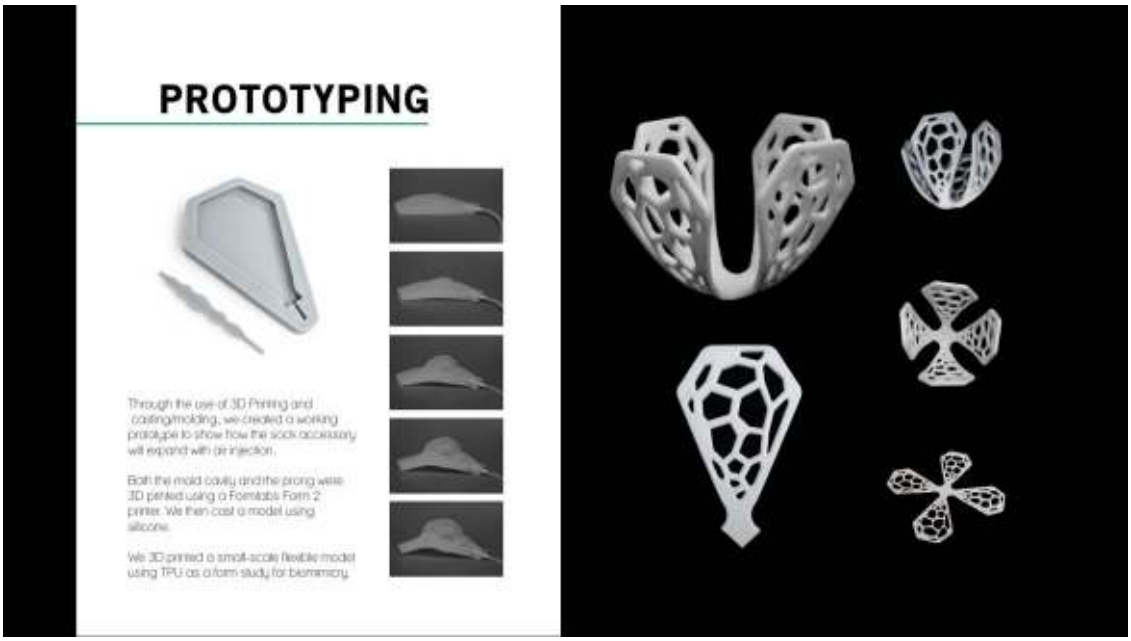

Figure 2. Prototyping. Flux

- HANDLE BUDDY: DOG AID

“Challenge: Current service vests aren’t compatible with extension handles and do not distribute weight evenly Opportunity: Design a handle that uses Molle system which is aimed towards service vests. Reduces long term joint damage and provides stability to owners. Focuses on the interaction between owner and best friend.” (Carillo, C. Aimi, J. 2018)

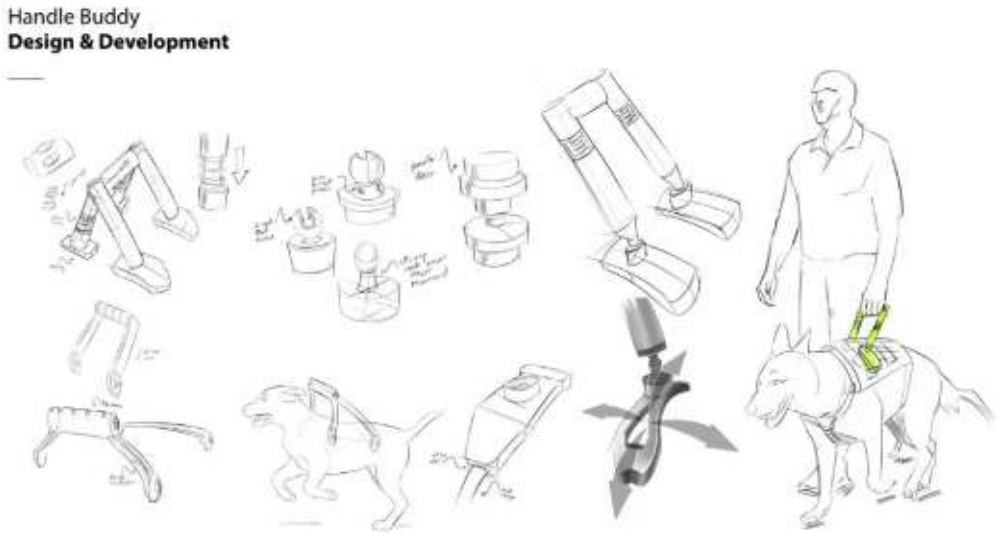

Figure 3. Design & Development. Handle Buddy.

Figure 4. Design Engineering. Handle Buddy.

5. CONCLUSION

As mentioned briefly in the introduction, recently a $447,971.00 US Department of Education grant was secured to develop Centers of Excellence for Veteran Student Success.
The next steps of this project will support a holistic approach and better service for the transition from soldier to student. It will also support veteran entrepreneurs who would like to take their ideas beyond the classroom. The Small Business Development Center (SBDC) at Kean will provide business counseling, help establish small businesses and support efforts to secure funding for veterans who want to translate their projects into finished products.

Additionally, new mediums continued to be considered for the project, such as Virtual Reality. Based on a few more tests, there may be an opportunity to introduce this technology to the veteran students. There is a proven record of the success of Virtual Reality (VR) Therapy when used in the presence of a clinician; “Months after the Sept. 11 terrorist attacks, Dr. Difede and Dr. Hunter Hoffman, who is the director of the Virtual Reality Research Center at the University of Washington, tested virtual reality treatments in one survivor with acute PTSD, one of the first reported applications of the therapy. Dr. Difede said that the first time the patient put on the headset, she started crying. ‘I never thought I’d see the World Trade Center again,’ she told Dr. Difede. After six hourlong sessions, the patient experienced a 90 percent decrease in PTSD symptoms. Dr. Difede later tested V.R. exposure therapy in Iraq War veterans; 16 out of the first 20 patients no longer met the diagnostic criteria for PTSD after completing treatment.” (Blum, D., 2021)
These VR therapy sessions have to be led by an expert; “Direct-to-consumer virtual reality therapy products, for now, remain rare, and only a few are covered by insurance. Companies that sell V.R. therapy software often explicitly state their products should only be used in the presence of a clinician. Experts like Andrew Sherrill, an assistant professor of psychiatry at Emory University in Atlanta who specializes in virtual reality therapy., worry that, as virtual reality expands, people seeking treatment might try out a program for themselves and not consult a therapist.” (Blum, D., 2021)

Thus, the VR sessions that Kean veterans will be introduced to are more in recreational therapy environments and aligned with the original idea of this project where design therapy (including VR sessions) is a supplementary tool to the traditional therapy sessions applied by VA. To better depict the implementation of this technology, a VR software called Gravity Sketch (www.gravitysketch.com) will be introduced. In this platform veteran students can design their ideas in an immersive environment.

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