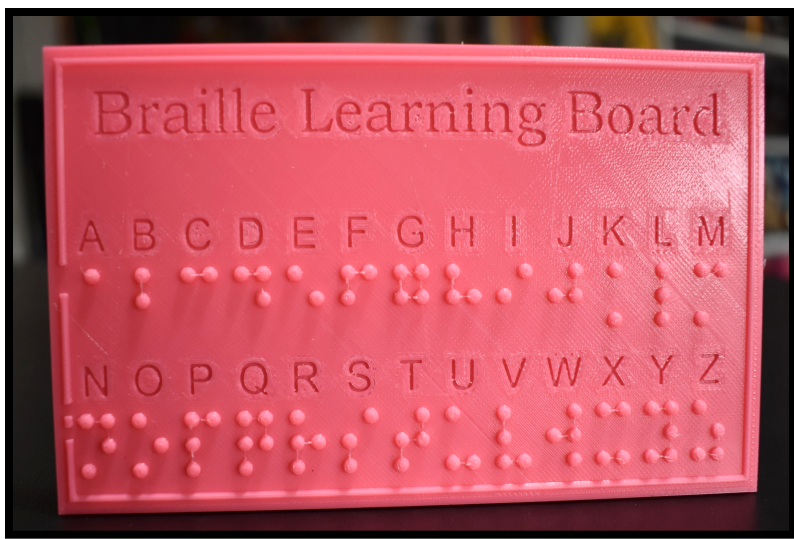
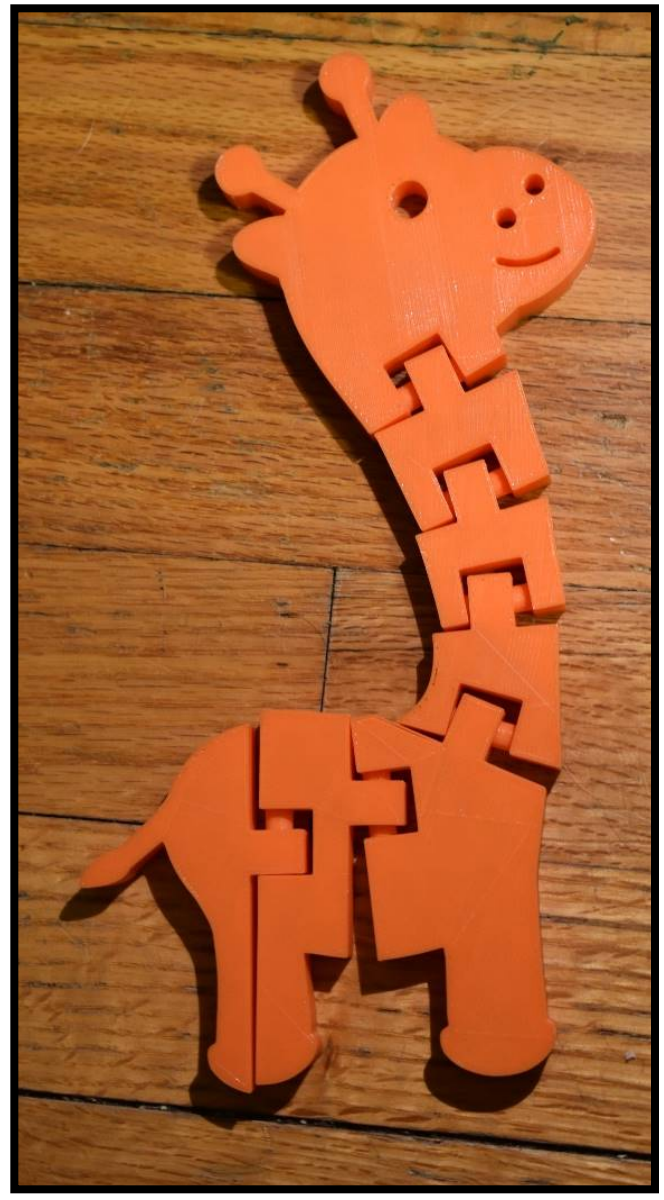


**TLC Celebration**  
**3D Printing Assistive Technology to Promote Participation in Physical Activity**  
**West Virginia University, College of Physical Activity and Sport Sciences**  
**Chloe Simpson, Dr. Andrea Taliaferro, Dr. Sean Bulger**

**PROJECT DESCRIPTION**

**Project Purpose**

- The objective of this grant is to fund a Dremel Digilab 3D45 3D printer for college-aged students to collaboratively develop physical activity (PA) related assistive technology (AT) to accommodate the participation of students with disabilities in the Friday Adapted Physical Education Program



**Project Description**

- Limitations exist when AT resources are financially unattainable or do not benefit an individual's needs.
- Commercially available adapted equipment and AT for use in PA settings are retailed to niche markets, are expensive, and availability is limited. Such adapted equipment and AT is often disregarded due to "one size fits all" design.
- Cost and fit limitations can be resolved through 3D printing which builds three dimensional objects from a digital file.
- WVU students can be empowered to solve real-world problems of inclusion by utilizing and developing 3D printed AT for student access and engagement.
- With the adoption of 3D printers in libraries and public schools, this project will help prepare our students as 21st century educator.
- By contributing to the open-source database of 3D prints, pre-professionals will make global connections through this active learning opportunity while achieving International Society for Technology in Education standards and the Society of Health and Physical Educators National Standards for Initial Physical Education Teacher Education, required of pre-service teachers.

**EVALUATION PLAN**

**Reach**

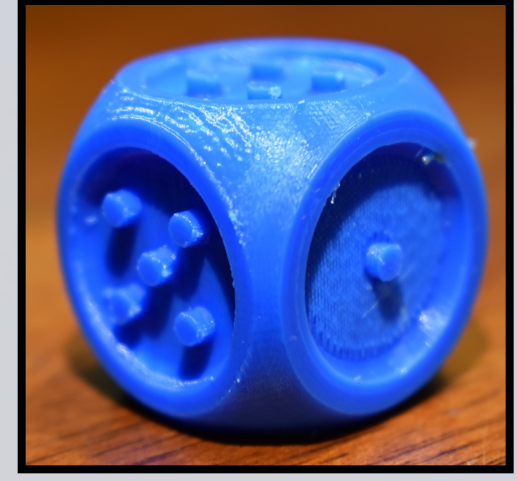
- Peer reviewed article to the Journal of TEACHING Exceptional Children, *Designing Inclusion: Using 3D Print to Maximize APE Participation* (Simpson & Taliaferro, *in press*).
- Poster presentation at the national conference for the Society of Health and Physical Educators (SHAPE America) *Examining the Opinions of Youth with Visual Impairments on 3D Printed Assistive Technology* (Simpson, 2021).
- Number of faculty utilizing 3D printed technology during instruction=2.

**Effectiveness**

- Results of open-ended questions indicated that students learned how to identify, print, and apply 3D printed assistive technology for use in PE and sport settings.
- "I believe that 3D printing could be very advantageous for use with a clipboard. For example, print off 11 players and a mini ball and walk athletes through a drill for visual aid." –Student, ACE 488

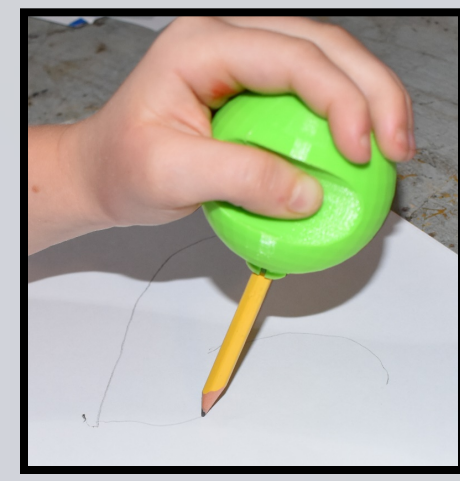
**Adoption**

- 3D print assistive technology lectures in four courses:
  - ACE 215, ACE 488, PET 447 and RPTR 145



**Implementation**

- Prints Made:
  - Trial and error misprints
  - Adapted bike pedal (x2)
  - Adapted pen holder (x2)
  - Braille Dice
  - Braille Alphabet
  - Head with nostrils for COVID-19 test demonstration



**Maintenance**

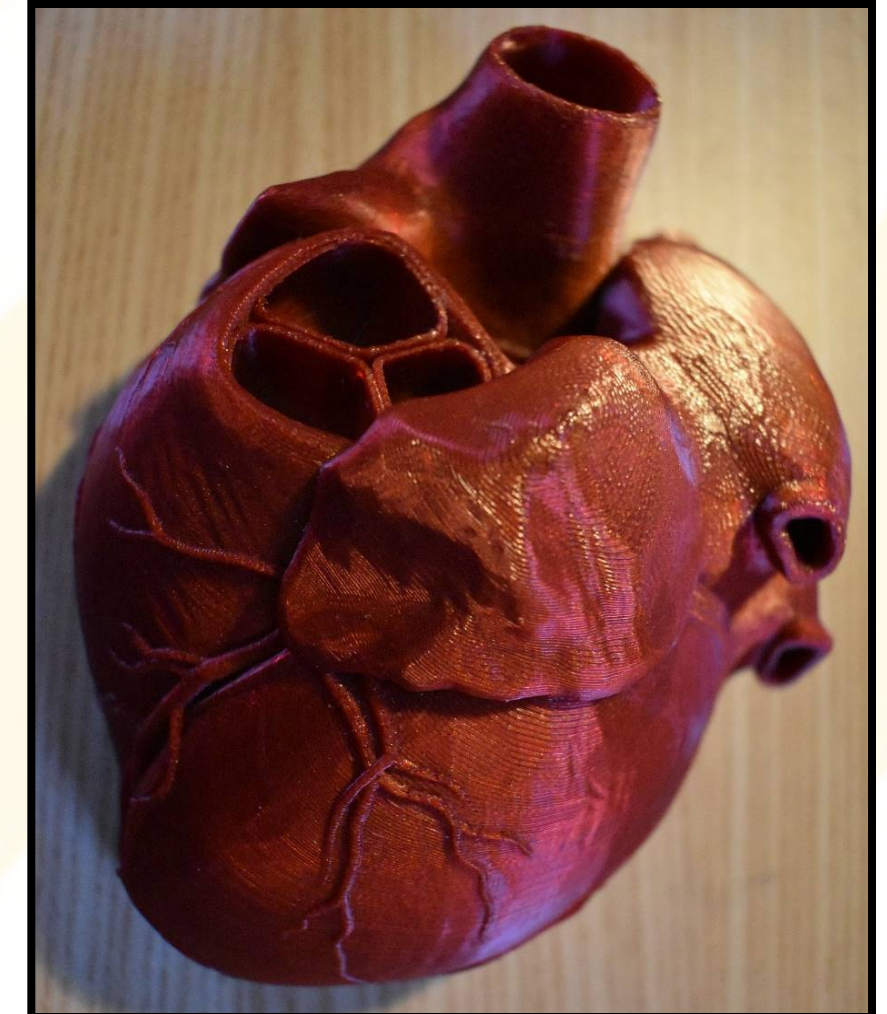
- Future plans involve the continued use of the 3D printer within CPASS courses and the Adapted Physical Education Practicum.
- Additionally, an online learning module on 3D printed assistive technology will be developed and implemented within 2 courses across the next year.

**IMPACT**

**Impact Statement**

- The Dremel Digilab 3D45 3D printer will have multi-disciplinary and multi-level impact on college-aged student learning and practicum experiences, and school-aged student inclusion in Friday APE practicum.
- This project has allowed pre-service teachers to make global connections through an active learning opportunity while achieving International Society for Technology in Education standards and the Society of Health and Physical Educators National Standards for Initial Physical Education Teacher Education.
- Despite the disruption due to COVID-19, the 3D printer was well integrated into the CPASS curriculum and research on assistive technology.
- A total of 64 WVU students across disciplines were taught about 3D printing in Fall 2020 and Spring 2021 classes:

Course	Undergrad	Grad
<b>Fall 2020</b>		
ACE 477	15	0
<b>Spring 2021</b>		
RPTR 145	19	0
ACE 215	12	2
ACE 488	15	1



**Continued Impact**

- Continued use of the printer will result in supporting the participation of student with disabilities in the Adapted Physical Education Friday Program through 3D printed assistive technology, assistive technology preparation to future physical activity professionals through developed training modules, and overall support to the CPASS curriculum through the creation of requested 3D prints.