The Trials & Tribulations of incorporating 3D Printing into the Health Science Curriculum

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Learning Objectives:

1. Participants will understand how to initiate a 3D printing program at their institution.

1. Participants will be able to identify strategies that help promote success and avoid pitfalls.
Outline:

● Why we did this project
● How we got started
● Basics of the project
● Challenges
● Benefits
● Q & A
Why did we want a 3D printer?

- Add a useful service
- Innovate
- Motivate librarians
- Embed into curriculum

*Educause article*

Colegrove, Patrick. 2014. Making it real: 3D printing as a library service. *Educause review online*
How did we get a 3D printer?

1. Support from Dean and Library Administration
How did we get a 3D printer?

2. Grant Application:

- Paid for: 3D printer, filament, extra extruder, two-day training, service contract
How did we get a 3D printer?

3. Partners
The basics of our project:

- OT and PT students would learn to design and print a device for a patient
- The library would provide:
  - Housing and maintenance of the printer
  - Instruction in 3D printing
  - Supervision of printing
  - Recordkeeping and coordination of all prototypes, files & prints
3D printing and occupational therapy:

- What is occupational therapy?
- What is an assistive device?
- How do occupational therapy and 3D printing go together?
- Examples of our creativity that facilitated function for an individual
Creation Process:

1. Student idea for an assistive device
2. Prototype created
3. Sent to engineering students for file creation
4. .STL file sent to library
5. Item printed!
So, what did we print?
Ideas to engage faculty:

- Educate self about the professional programs in your college
- Propose an idea for a object that can be made to:
  1. Demonstrate a concept to the student
  2. Have the student learn a concept through using 3D printing
  3. Offer to manage some aspect of the project
  4. Make a one-and-done assignment or a short workshop as a push in the a course
  5. Extra credit project
  6. Make learning videos for the professor on the topic
Challenges: File Design

- Designing files is extremely difficult:
  - Our partnership with eNable UC turned out to be crucial to the success of our project
Challenges: Exploring 3D Design

- Basic file creation

Step by Step Instructions for creating your keychain

Press Pause as needed during the video

kapwing.com
Challenges: Organization

- Interprofessional/Educational Communication
### Challenges: Staff Turnover

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Challenges: Bloopers

- Equipment failure & printer malfunctions
  - Delivery problems
  - Equipment replacement
Challenges: Physical Therapy Projects

- Physical therapy projects (hand and foot orthotics) were unsuccessful
  - Files were too difficult to create due to the curvature of the objects
- Some partners are more motivated than others
Challenges: Scanning

- MakerBot 3D scanner was unable to print successfully
- Some success with iPad scanning
Challenges:

- 3D printers are noisy!
- Too many projects, project mix-ups, size restrictions
- New questions coming up now - Copyright? Patents? Liability? We will have to deal with these eventually
Benefits & Successes: Skills

- Growth of staff knowledge/new skills for librarians:
  - Operation of 3D printers
  - Basic .stl file creation with Tinkercad
  - 3D scanning (with MakerBot scanner & iPad scanning)
  - Makerfaire
  - Video tutorials and voicethreads
Benefits & Successes: Communication

- Collaboration among students, staff members, departments, and other institutions
Benefits & Successes: Sharing

- Presentations at staff meetings
- Local MakerFaire
- Social media presence (Facebook, Instagram,
  Twitter, Library blog)
- Scholarly article
Benefits & Successes: Library

- Increased traffic into the library
- Greater student and library staff interaction
- Increased library visibility
Benefits & Successes: Students

- Students gained new skills and hands-on experience before they graduate
- 3D printing promotes student innovation and creative thinking
- Students have the ability to help real patients from their clinical rotations
Benefits & Successes: Smiles
Our 3D printed objects in the real world:
Barbara M. Jones, Director of ALA’s Office for Intellectual Freedom

“Librarians should not wait to begin a 3-D printing space for some ideal time in the future when all the problems will be solved. Start now, with your goal and some policies that will undoubtedly evolve. The rest will fall into place”
Thank you!

- Katie Flood, Library Assistant, Touro College
- ACRL New England for giving us the opportunity to present this program

Questions?