CHAPTER 26

Case Study: East Carolina University, Teaching Resources Center's Ann Rhem Schwarzmann Production Center

This case study was provided via an interview with Dan Zuberbier, Education and Instruction Technology Librarian, as well as from documentation provided in the two articles cited at the end of the case study and from statistical sources collected at Joyner Library.

26.1 TYPE OF SPACE OFFERED

Makerspace

26.2 MAIN IMPETUS FOR PROJECT

Initiating cross-disciplinary collaboration, sharing knowledge, and supporting innovation are the main objectives of the Ann Rhem Schwartzmann Production Center. Additionally, providing a makerspace for preservice teachers, faculty members, and area educators fits the mission and goals of the Teaching Resources Center, which are listed below.

26.2.1 Our Mission

The mission of the Teaching Resources Center is to facilitate teaching and learning initiatives by providing resources and services to educators at all levels.

26.2.2 Our Goals

To serve as a model resource center by:

- Developing and maintaining a birth to 12th grade collection
- Conducting reference and instruction
- Providing outreach to area schools and educators
- Supporting educators with technology and equipment in the Ann Rhem Schwarzmann Production Center (source: TRC Website)

Development of Creative Spaces in Academic Libraries
DOI: https://doi.org/10.1016/B978-0-08-102266-5.00026-8

The space was founded in 2003 as a low-tech makerspace, although it was not named as such. It was originally called the Enhancing Teachers Classrooms Room (ETC Room) and was primarily focused on helping preservice teachers and area educators to enhance their classrooms through making posters and other items. There have been many revisions and additions over time to the room, but until 2014 when a donor gave funding and the space was renamed to the Ann Rhem Schwarzmann Production Center, most of these have been fairly low-tech and based in the realm of craft materials. Recent additions include a poster printer, vinyl sign cutter, and other technology. During the spring 2014 semester, the College of Engineering and Technology's (CET) Department of Technology Systems approached Joyner Library to make 3D printing more accessible to the campus community by placing a ZPrinter 310 Plus printer in a converted study room. This first 3D printer was not located in the TRC's Production Center. A large number of staff at the library received training and information about 3D printing during this time-frame, garnering strong interest in the technology. The cost of printing was high at \$4 in.^{3}, and the room was locked when not in use. This led to low usage of the space. Although this first foray into a 3D printing partnership was not exactly a success, the training fostered larger conversations about including 3D printing in Joyner Library and the Production Center. There was a strong movement towards adding more high-tech pieces of technology to the space that mirror the maker movement in K-12 education, particularly 3D printers. This technology was a focus because they were deemed one of the more accessible pieces of technology at the time for both cost and ease of use.

26.3 BRIEF TIMELINE OF PROJECT

2003

- The Teaching Resources Center gets its first makerspace, the ETC Room, in a 150 square foot office. It included one laminator, a button maker, and a die cut machine.

2006

- The ETC room is moved into a much later space and added additional materials. The new space for the ETC room was approximately 900 square feet. A second laminator was added, as well as a comb binder, art waxer, poster printer, and three additional die cut machines.

2014

- An industrial grade powder-based 3D printing system comes to the library in a study room in conjunction with the College of Engineering and Technology, but is not associated with the TRC.
- A donor gives endowed funds and secures naming rights for the space, which changes names to the Ann Rhem Schwarzmann Production Center.

2015

- In summer of 2015, 3D printers were researched and two fused deposition modeling (FDM) 3D printers were purchased and installed in the Production Center. Dan Zuberbier is asked to serve as the librarian in charge of the service.
- October 1, 2015: Joyner Library's 3D printing service goes live.

2016

- Partnered with Center for STEM Education (part of College of Education at ECU) to teach a 3D printing and design class for high school-level Summer Ventures in Science and Mathematics program. This program took place in the library and was taught by Dan Zuberbier.
- Three high-grade FDM 3D printers were purchased for this program, one is on permanent loan to the TRC.

2017

- In January 2017 the 3D printer moved into its own space, separate from the Production Center but in the same physical area of the library, approximately 450 ft^2.

26.4 APPROXIMATE COST OF PROJECT

In the most recent update to the 3D printing lab, an existing space was repurposed so there were no construction costs. The three 3D printers cost approximately $8250, plus consumables. The initial cost of the filament for the printers was around $1000. Other tools were needed, including a storage cabinet, which was around $500. Some furniture and computers were repurposed; library IT provided computers, and building operations supplied tables and desks. In 2017, library IT purchased a high-end computer (approximately $3500) with a CAD graphics card because students were submitting models that were becoming increasingly complex. This increased the average print's file size, and required more RAM to manipulate the models.

26.5 CAMPUS PARTNERS AND THEIR ROLE

- College of Engineering: Came with initial 3D printer, helps to find student workers
- C-STEM (Center for STEM Education): Bought a 3D printer, now on permanent loan in the space, organizes Summer Ventures
- Miller School of Entrepreneurship: This new department on campus is accepting grant applications to help promote 3D printing for proof-of-concept for business ideas. Joyner Library is playing a supporting role in Engineering & Entrepreneurship professors' joint grant applications to support a new, cross-listed class.

26.6 OUTSIDE PARTNERS AND THEIR ROLE

- Ann Rhem Schwarzmann: Donor
- Betty Debnam Hunt: Donor

26.7 DID YOU VISIT OR RESEARCH ANY OTHER SPACES FOR IDEAS BEFORE STARTING THE PROJECT? IF SO, WHICH ONES?

Note: the majority of these site visits happened after the space was opened.

- Georgetown: Contacted them and shared ideas
- UNC-Greensboro's Self Design Studio: Site visit
- NC-State's College of Education METRC: Site visit
- NC-State's Hunt and Hill Libraries: Site visit
- Duke's Innovation Co-Lab: Site visit
- In addition to these visits, the librarian who runs the space keeps up with current trends in academic libraries through the literature and via listservs.

26.8 DID YOU CONDUCT A NEEDS ANALYSIS OR ANY OTHER TYPE OF ANALYSIS? DID IT REVEAL ANYTHING SURPRISING?

No

26.9 LESSONS LEARNED DURING RESEARCH OR BUILDING PHASE

Beg, borrow, and steal if you are on a tight budget. We reused a space, furniture, and even computers to keep the budget low. We have learned that sometimes it is better to ask for forgiveness than permission when it comes to little things. An example is creeping into our new space by placing one of the 3D printers into the office before fully taking it over.

You cannot over-plan. Know how you are going to evaluate or assess the space when you start out, because trying to retrofit a set of benchmarks and gathering past information is difficult.

26.10 EXAMPLES OF STUDENT PROJECTS

- A senior College of Health and Human Performance major printed a prototype and functional model for a new style of kettle bell for a utility patent application.
- Three PhD students in Communication Sciences and Disorders program designed digital models of the tiny muscles in the soft palate of the mouth to use as part of their research, and as visual aids in the classes that they teach.
- A graduate student in the Maritime Studies program designed a forearm mount for a Go-Pro that helped her take video and pictures during their underwater shipwreck dives.
- A Public Health major and Army veteran who has a car detailing business had the lab help him print designs for cases to hold LED lighting on cars.

26.11 EXAMPLES OF FACULTY COLLABORATIONS

- Brody School of Medicine surgeons contacted the lab for guidance to create a model of a man's ribcage who suffered from extreme scoliosis. This helped them plan the surgery before they operated: http://www.ecu.edu/cs-admin/news/3Dprinting-Brody.cfm.
- A Science Education class had a doorstop design contest to create a working doorstop for a specific door in our Flanagan building on ECU's campus.
- The Geology department has commissioned the space to print off 3D printed topographical maps for their labs in conjunction with their augmented reality sandbox.

26.12 USAGE STATISTICS AND METHOD OF COLLECTION

The Production Center statistics are kept in the library's ILS and are counted by scanning a barcode. The staff member working at the TRC's public service desk scans a barcode when someone enters the space. A second barcode is scanned when they tell the worker their main purpose for using the space. The Production Center is only open during the desk's operating hours. Some usage statistics are as follows: 3249 people entered the space from July 1, 2016 to June 30, 2017. Of those, 329 posters were made, the vinyl sign cutter was used 69 times, and the use of the media computers in the space was 382. The largest use of the room was for lamination, with 1470 people using the laminator. The second largest use of the room was for die cuts at 791 users. Die cuts are a type of pressure-based stencil used to make graphical figures out of paper for bulletin boards and posters.

For 3D printing, the print requests and consultation forms are submitted online and statistics are kept this way. There were 96 print requests from 56 unique patrons in the spring of 2016, 25 during the summer, and 65 during the fall 2016 semester. Workshop attendance is counted, with 40 students taking part in drop-in workshops in 2016; an additional 175 students were reached via seven in-class demonstrations. In spring of 2016, the library offered workshops on 3D printing designed specifically for faculty in different fields of study. They were broken up by Arts & Humanities (6 attendees), Math & Sciences (4), Health Professions (14) and Social Sciences (canceled due to lack of registrants). LibGuides usage is also tracked, with 2170 views by the end of spring 2016 and 1806 views during fall of 2016.

26.13 ANY OTHER TYPES OF ASSESSMENT COMPLETED

We researched other places on campus that were doing 3D printing and mapped them in an interactive map that students can access on our LibGuide, found here: http://libguides.ecu.edu/3dprinting. Additionally, we give short assessment surveys after consultations and workshops.

26.14 LESSONS LEARNED AFTER OPENING THE SPACE

Do not be afraid to start small and do things like limiting advertising or outreach to control growth if you do not have the staffing to cover a full-

fledged makerspace that you see at other universities. You can slowly grow from something small. For 3D printing, we did a soft rollout with just the College of Engineering and College of Education the first semester, but started advertising to everyone on campus the next semester. The next fall, we started adding educational programming and workshops, and advertising those with a broader marketing campaign in resident halls and other buildings on campus.

We are not the only ones on campus doing 3D printing, and you probably will not be, either. Get to know other people in other departments on campus who are interested in this sort of thing. You will not be able to help everyone who comes through your doors, but you might know someone else on campus who can and help by playing matchmaker. You might not be able to do everything with all of the pieces of software you have; people will walk out of the doors happy if you find them another place to get help.

26.15 CONTACT INFORMATION FOR THIS SPACE

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FURTHER READING

Teaching Resources Center. (2017). About us. Retrieved from: http://www.ecu.edu/cs-lib/trc/about.cfm.

Zuberbier, D.P., Agarwala, R., Chin, R.A., & Sanders, M.M. (2017). Climbing to cruising altitude: Promoting an academic library's 3D printing service. American Society for Engineering Education Proceedings from 124th Annual Conference and Exhibition, Paper ID #18024. https://www.asee.org/public/conferences/78/papers/18024/view.

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