EVERYTHING IS AWESOME! BUILDING, COLLABORATING, AND LEARNING IN A LIBRARY MAKERSPACE

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O 2º Workshop das Bibliotecas de Ensino Superior, com o tema "Novos espaços e estratégias para a aprendizagem, fluência digital e experimentação"

26 May 2020

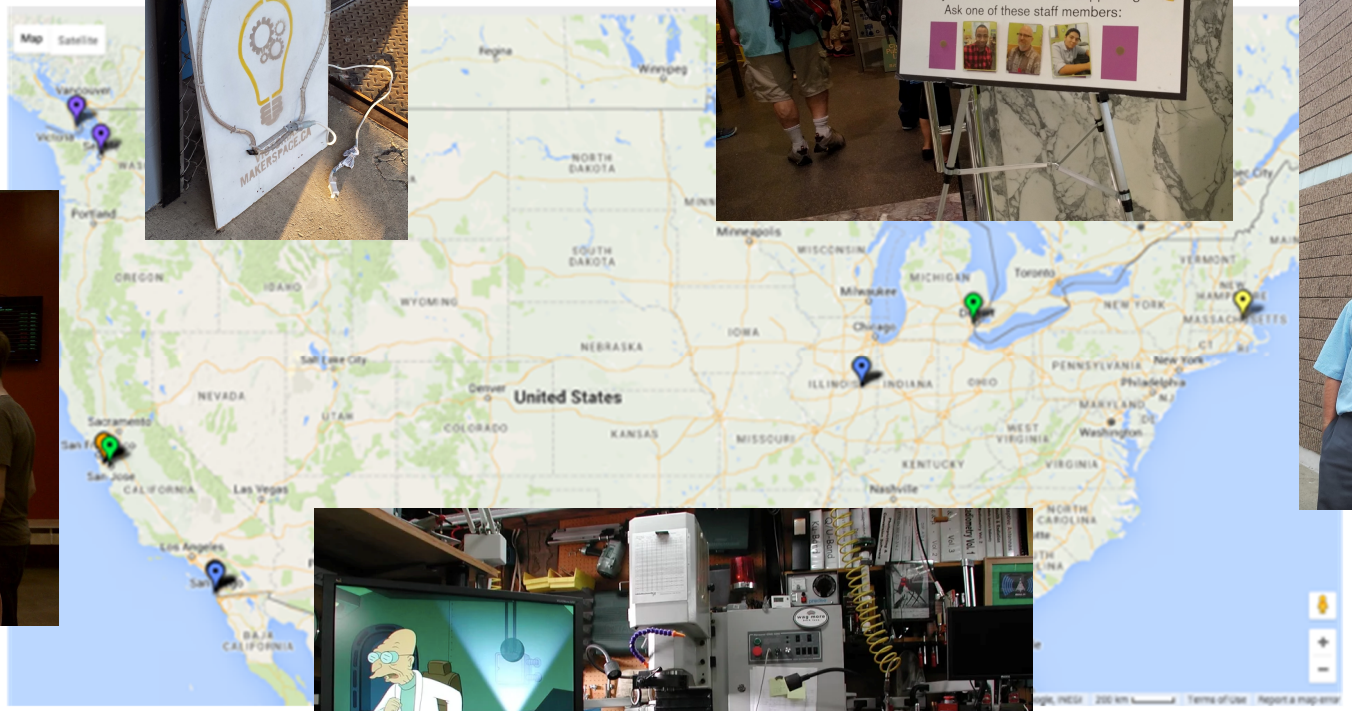
SAN DIEGO STATE UNIVERSITY

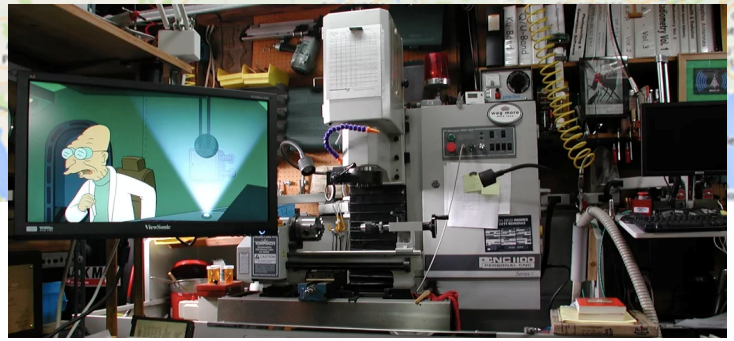
Library

THE FOUNDATION

Implementing a Higher Education Library Makerspace

MY BACKGROUND





“BOOKS AND OTHER LIBRARY RESOURCES SHOULD BE PROVIDED FOR THE INTEREST, INFORMATION, AND ENLIGHTENMENT OF ALL PEOPLE OF THE COMMUNITY THE LIBRARY SERVES.”

- American Library Association’s Bill of Rights #1 (ala.org/advocacy/intfreedom/librarybill)

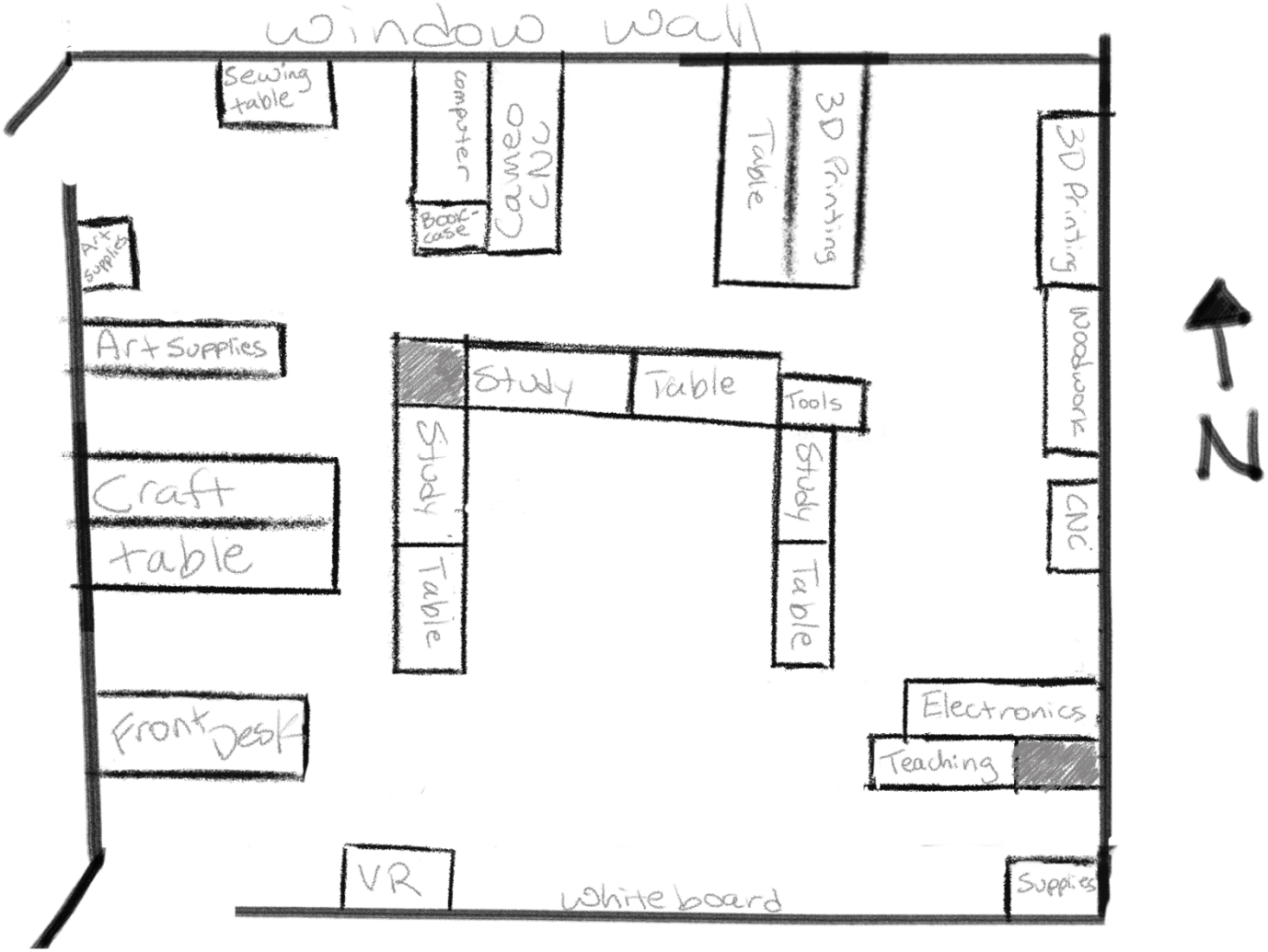
build IT

EXPLORE BUILD EDUCATE

- Established in Feb. 2015 as a library space & service

THE SPACE

- Space size is ~1,200 sq. ft
- Allocate space into different work zone
- Highly visible

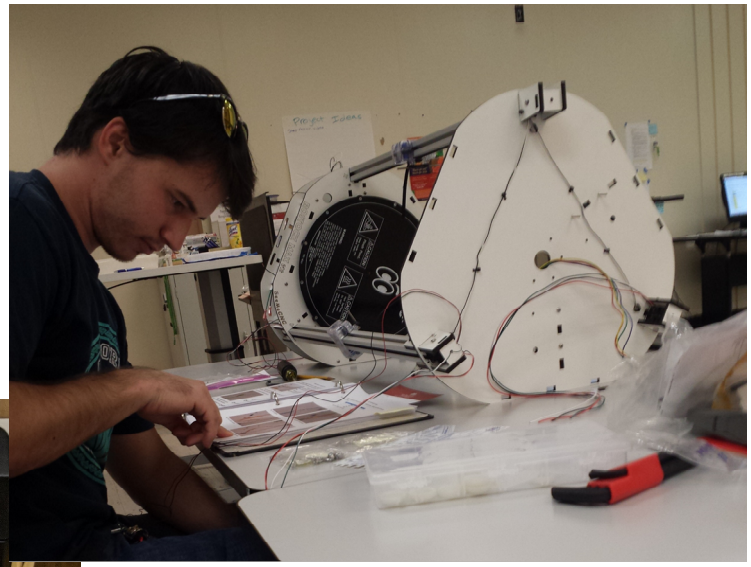


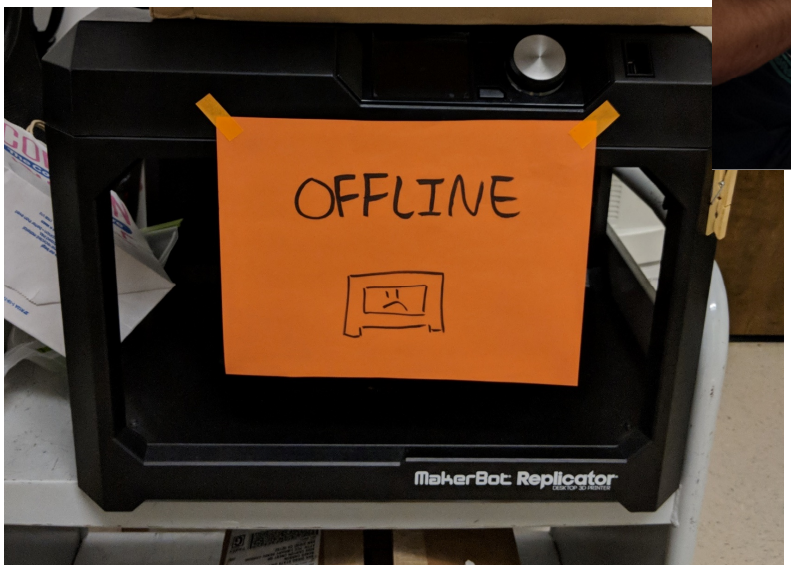
THE EQUIPMENT

- IT = Information Technology
  - Equipment is an entry point to teach them the basic principles of it works
  - Not for large scale manufacturing
- Being within a library limits what equipment can be added
  - Safety; knowledge skill to use; cost
- Free isn't always Free
- Opportunity to revive old technology

OPEN SOURCE VS VENDOR PRODUCT

- What is included needs to require low maintenance; little to no service contracts; application to other equipment
- Software Licenses





WHAT WE HAVE...

- 3D Printers
  - Monoprice Select Mini V2
  - Rostock
  - AnyCubic i3 Mega
  - MakerGear
- 3D Scanners
  - Structure Sensor
  - Matter & Form
- CNC Machine
  - Inventables Carvey
- Digital Die Cutting Machine
  - Silhouette Cameo
- Sewing/Embroidery Machine
  - Brother SE 600
- Virtual Reality Headsets
  - Google Cardboard
  - Oculus Rift
  - HTC Vive
- Electronics
  - Littlebits
  - Sparkfun Inventor Kits
  - Soldering Iron, Oscilloscope, Power Supply
- Tools
  - Button Maker
  - Dremel
  - Hand tools
- Supplies
- Leftover Old Technology
  - Google Glass

Find more info on our website: https://buildit.sdsu.edu/

TOOLS & SUPPLIES

- Surrounding one's self with things that inspires ideas and opportunity
  - It gives them examples of what's possible
- Can't do if you don't have

THE FUNDING

Initial investment from a university grant of $11,713

- Only used to purchase equipment
- Reused leftover furniture
- No renovations to the Space
  - Was a computer lab, they just moved out the computers and we moved in
- No funding for staff

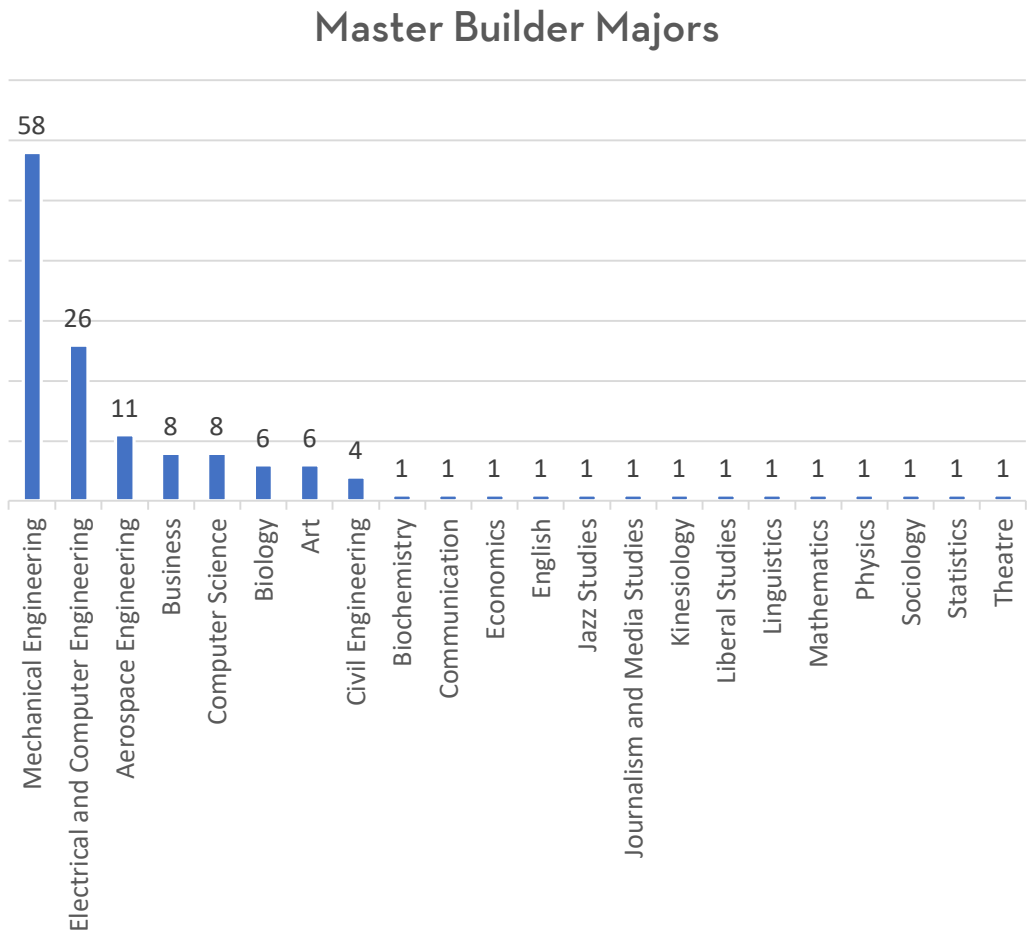
Annual budget from library

- $8,000 for supplies and renewal of technology
- $16,352 for student workers
- Salary for 1 FTE staff member & .5 FTE librarian

THE STAFF

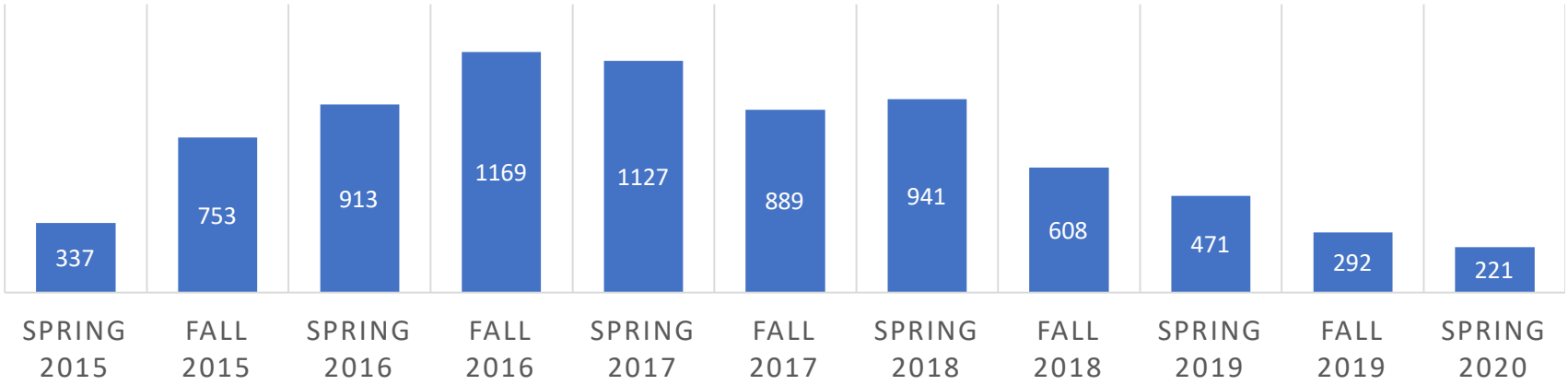
MASTER BUILDERS

- Student volunteer 3 hours per week
  - Front Desk; 3D Print Manager; Generalist
- In return, they get certain privileges like after-hours access and long print time
- 141 students from various majors over 5 years



SERVICES

- 3D Print Requests

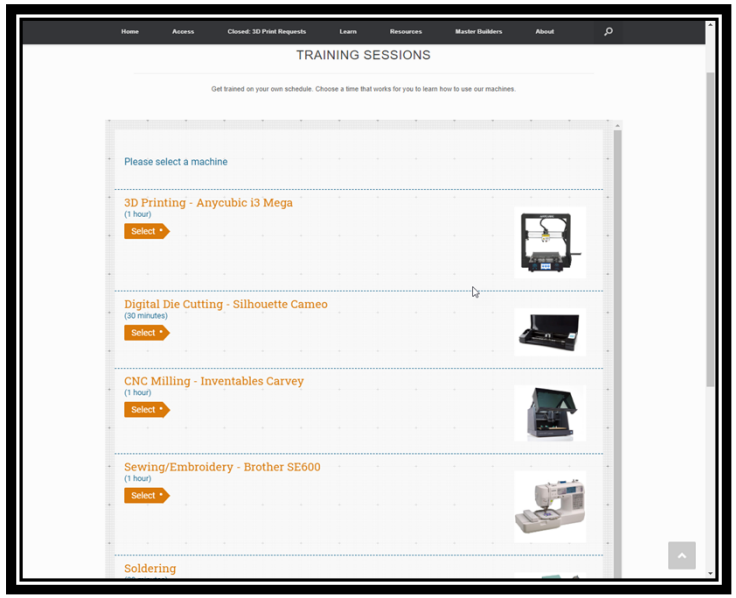


- Online Submission of <3 hr print requests

*Shift from we'll print for you to you print for yourself

MAKERSPACE ACCESS

1. Orientation
2. Trainings
3. Equipment Reservations



WELCOME TO

buildIT

EXPLORE BUILD EDUCATE

OUR PHILOSOPHY

Principles that ground the work of build IT

GRASSROOTS DEPLOYMENT

- Use collective action from the local level to effect change at the local, regional, national, or international level
- Started small with the students are grew once I gained their support

Photo by Larm Rmah on Unsplash

PERPETUAL BETA

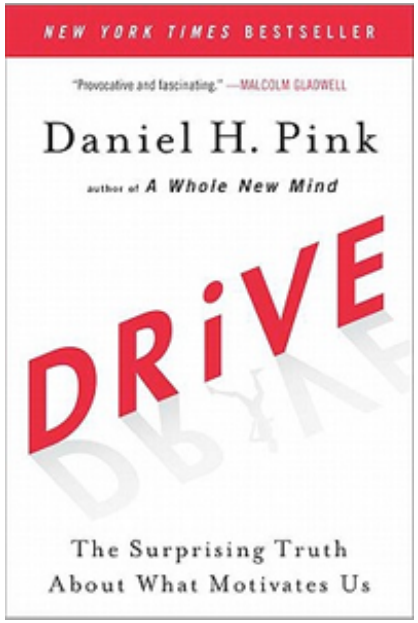
Photo by Will Porada on Unsplash

- a term used by software developers meaning that the product is never fully finished
- Two key components:
  - Trusting/treating users as co-developers
  - harnessing collective intelligence

- https://www.destination-innovation.com/try-perpetual-beta-for-continuous-innovation/

HANDS-ON ENGAGEMENT

- https://www.ted.com/talks/dan_pink_the_puzzle_of_motivation/up-next?language=en



- Autonomy – Our desire to be self directed. It increases engagement over compliance.
- Mastery – The urge to get better skills.
- Purpose – The desire to do something that has meaning and is important.

PEER-TO-PEER INSTRUCTION

INFORMATION LITERACY & DIGITAL FLUENCY

through Equipment Training Sessions

INFUSE INFO LIT INTO SELF-ELECTED LEARNING

- Leverage students' technology interest to attract them in
- I control how they get access to the tech
- So, let's integrate information literacy into their trainings

TRAININGS INSTRUCTION STEPS

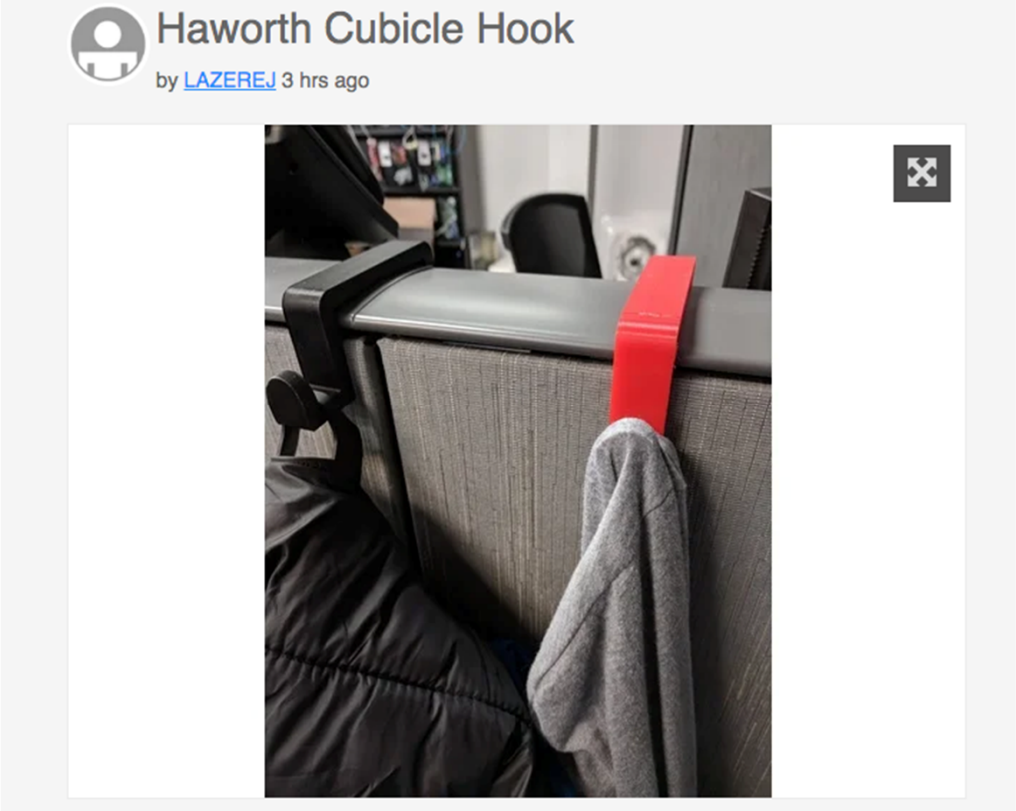
1. Review a slide show that discusses:
   - What's the machine's purpose?
   - What it is used for?
   - It's parts & materials
   - Steps to properly use it
2. Use the machine to create something

INFO LIT & 3D PRINTING TRAININGS

- Authority is Constructed & Contextual – ACRL Info Lit Threshold
- Thingiverse

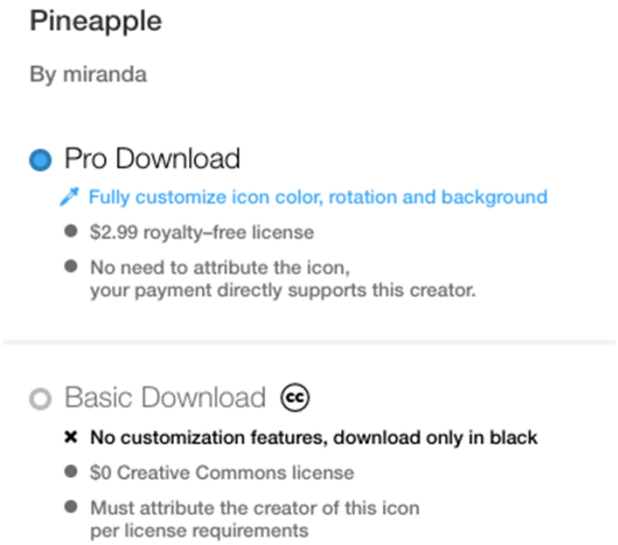
3D Printing Training

By Jenny Wong-Welch and Lindsay White
Some Illustrations by Joey Casabar

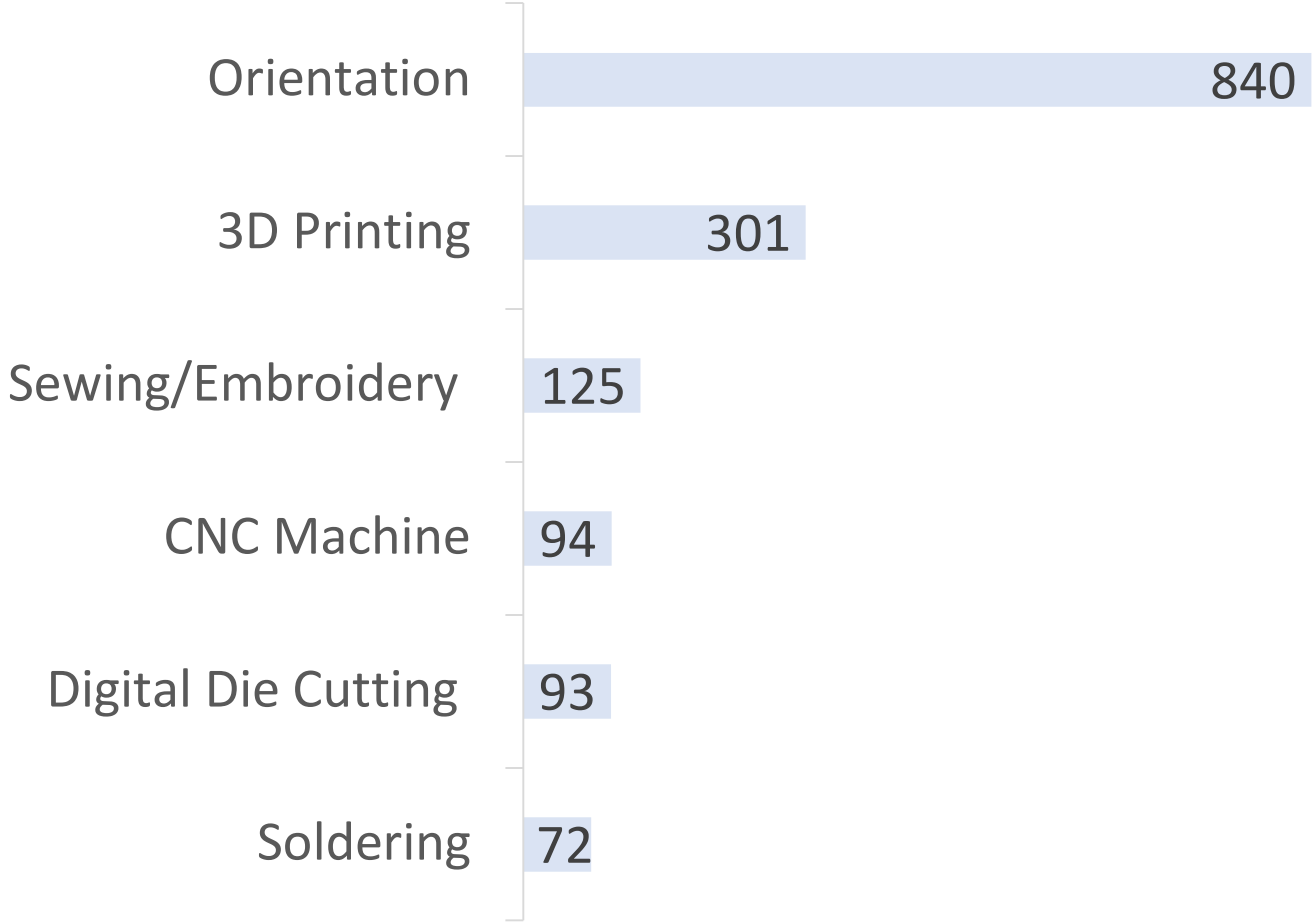


INFO LIT & DIGITAL DIE CUTTER TRAININGS

- Information has Value
- The Noun Project



LOOKING AT THE NUMBERS



- Information literacy taught in direct relation to something that interests the student
- More likely to understand the threshold concept, remember it, and reuse it

GOING BEYOND DEMOCRATIZED ACCESS TO TECHNOLOGY

Higher Education, Learning, & Information Literacy

UNITED STATE EDUCATION SYSTEM

Photo by NeONBRAND on Unsplash

- Strutured with little time for exploration of subjects
- No Child Left Behind Act
  - Tests for federal funding
  - Not placement test for individual student achievement
  - Everyone is treated equal
- University is when we explore what we want to learn

LEARNING HOW TO LEARN

- Most people enter higher education with the intention of learning something
- For many young students, the reasons might be more “shallow”
  - their friends do it
  - they need qualifications to land their dream job
  - they simply do not know what else to do
- Whatever the reasons, they need to be prepared for an advanced level of learning
- With higher education, you learn to how learn
- There’s a shift from being told what to learn to becoming an independent learner with sufficient self-discipline to regulate their own learning

INFORMATION LITERACY & LEARNING

- The ACRL *Framework for Information Literacy for Higher Education* defines information literacy as
  - the set of integrated abilities encompassing the reflective discovery of information
  - the understanding of how information is produced and valued
  - the use of information in creating new knowledge and participating ethically in communities of learning
- The most important purpose of these skills is to improve our learning and formation process
  - We teach information literacy to help students learn more and learn better and thus get more out of their education
- So, the underlying aim of all IL teaching is to enhance learning in some way

“AN INFORMATION LITERATE CANNOT UNLEARN THEIR NEW WAY OF VIEWING AND RETURN TO HIS PREVIOUS STATE. THIS MAKES IT VERY DIFFICULT TO CONVEY TO BEGINNERS HOW TO GET ACROSS THE THRESHOLDS IDENTIFIED. THE EXPERTS MUST REMEMBER BACK TO A TIME WHEN THEY DID NOT “KNOW” AND IDENTIFY WHAT THEY DID IN ORDER TO CROSS THE THRESHOLD.”

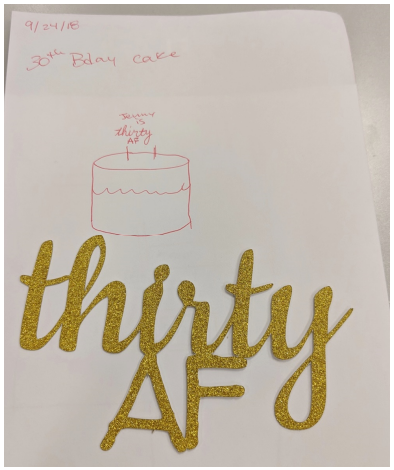
Teaching Information Literacy Reframed – Joanna M. Burkhardt

HOW I TEACH INFO LIT IN THE MAKERSPACE

1. Be a leader and make things
2. Be among the learners
3. Be intentional with reflection

THE MAKING PROCESS

- Information decisions must be made
  - Can this be done?
  - Where do I find this?
  - What's needed to do it?
  - How much does this cost?
  - How much time will this take?



The Information Decision Process

1. I have a need
2. I know where to find the information for my need
3. I can select the information
4. I can applied the information to my need
5. I can determine if my application works
6. I can reflect on what I learned from this process

THE MAKERSPACE IS A LEARNING COMMONS

- In the learning commons model, the library becomes a laboratory
- Configured and equipped with technology so that students can engage in and create formal or informal projects on their own
- Bring people together not around informally shared interest, as happens in traditional common rooms, but around shared learning tasks

GOING BEYOND THE LEARNING COMMONS

The Makerspace Community

- "In recent years we have reawakened to the fact that libraries are fundamentally about people – how they learn, how they use information, and how they participate in the life of a learning community."

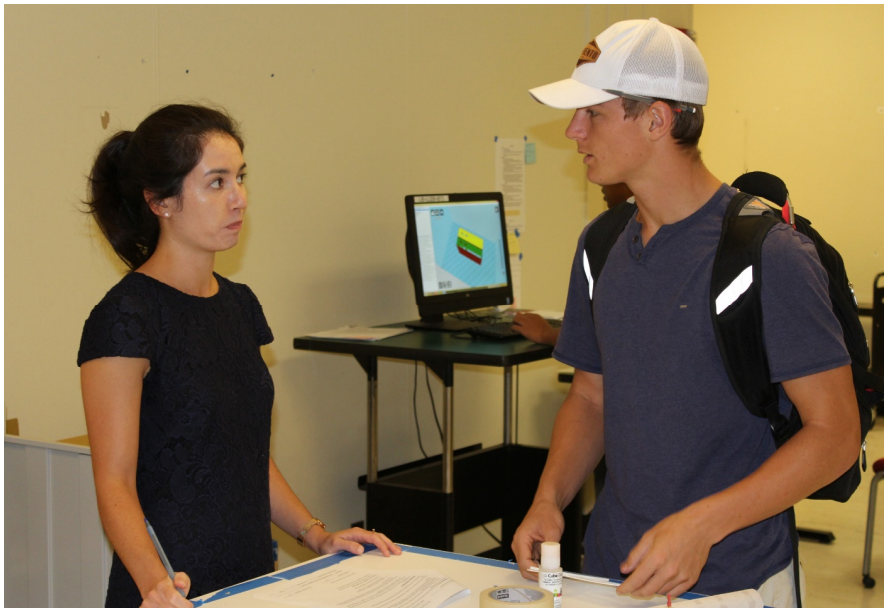
(Demas, 2005, p. 25).

“...KEY QUESTION FOR ACADEMIC LIBRARY SERVICES IS WHETHER THE MAKERSPACE ITSELF IS SOMEWHERE LEARNING SUPPORT FROM LIBRARIANS CAN BE ‘EMBEDDED’”

Makerspaces: a beneficial new service for academic libraries? - Robert Curry

THE MAKERSPACE LIBRARIAN

- In our makerspace, librarians coexist with the students
- I am responsible for the community's health
  - Time is invested in building and sustaining authentic connections with the students
  - Respect for each other
- I am me
  - Exude friendliness, generosity, passion, resourcefulness, sincerity, wittiness



ME AS AN INFO LIT TEACHER

Being part of the community allows me to educate students in a new way

1. I'm not the making or tech expert
   - It's difficult to not simply give the answer when I might know it
   - Must stop self and think about how I can teach in the moment
   - Like a reference question, my goal is to guide a student through the learning process
   - "That's a great question. I challenge you to find the answer. Here's how I might start to solve it."
2. Info Lit beyond School
   - Personal life, career decisions
3. Reflection discussions
   - There's follow-up. It's not one-shot
   - Asking students to "think about their own thinking" and their own learning is an essential perspective in modern information literacy and in learning in general (Jacobson & Mackey, 2013).
   - Acquiring good and useful learning strategies depends on an active reflection on personal learning

TEACHING THE THRESHOLDS

Information has Value

- Can you reuse that?
  - How are you using it?
- Ownership of the work you create
- As a student in build IT, you hold information that others want. Through sharing (or not) it, you can influence them.

Authority is Constructed and Contextual

- How did you know what you found would work?
  - What were the author's credentials?
  - Number of reviews, written comments that say it was a success, photographic/video proof, the code works
- You as student in build IT have authority

IN SUMMARY - INFO LIT IN THE MAKERSPACE

- Students have a willingness to learn how to learn
- IL is taught through self-elected learning of equipment trainings
- A makerspace librarian who builds the community can coexist with students and teach them learning strategies that align with IL concepts
- Must be intentional in every day discussion

UNEXPECTED BENEFITS

For students and librarians that result from build IT

THE COMMUNITY, LIFELONG FRIENDS, MENTORSHIP

QUESTIONS?

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BIBLIOGRAPHY

- Lokse, M., Lag, Solberg, Andreassen, & Stenersen. (2017). *Teaching Information Literacy in Higher Education* (1st ed.). Chandos Publishing.
- Kuhlthau, C. C. (1991), “Inside the search process: Information seeking from the user's perspective”. J. Am. Soc. Inf. Sci., 42: 361-371. doi:10.1002/(SICI)1097-4571(199106)42:5<361::AID-ASI6>3.0.CO;2-#
- Burkhardt, J. (2016). *Teaching information literacy reframed: 50 framework-based exercises for creating information-literate learners.*
- Roberts, R., (2007) "The evolving landscape of the learning commons", Library Review, Vol. 56 Issue: 9, pp.803-810, https://doi.org/10.1108/00242530710831257
- Demas, S. (2005) “From the ashes of Alexandria: What’s happening in the College Library?” , in Freeman, G.T. (ed.), *Library as Place: Rethinking Roles, Rethinking Space*, CLIR, Washington, DC, pp. 25-41.
- Curry, R., (2017) "Makerspaces: a beneficial new service for academic libraries?", Library Review, Vol. 66 Issue: 4/5, pp.201-212, https://doi.org/10.1108/LR-09-2016-0081
- Jacobson, T., & Mackey, T. (2013). “Proposing a Metaliteracy Model to Redefine Information Literacy.” Communications in Information Literacy, 7 (2), 84-91.