Making Maker Literacy:
Transforming the Undergraduate Curriculum with Experiential Learning at the UT Arlington FabLab

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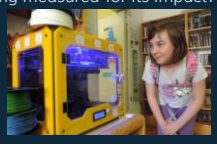
Makerspaces in Libraries

- Trending phenomenon
  - 41% libraries have some type of maker-related activities
  - Additional 36% plan to start
- What kind of learning is happening?
- How is this learning measured for its impact?

Transferable Skills

- Critical & creative thinking
- Research skills beyond Google
- Project planning & management
- Material sensibilities (how things work)
- Professional communication
- Ability to work in multidiciplinary teams
- Adaptability & Resilience

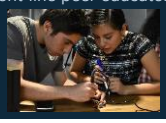
Why the Library?

- The "Switzerland" of Academia
- Place of discovery, learning, and creativity
- Democratized access
- Experiential learning sandbox
- And of course, the UTA Library's FabLab!

Our Service Model

- Library as Teaching & Learning Space
- Peer education initiatives

- 1 Director
- 2+ technicians
- 45+ student staff (front-line peer educators)

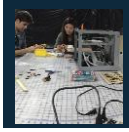
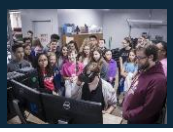
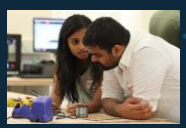


What is the FabLab?

- MIT chartered global initiative/network
- Provides access to digital fabrication technologies
  - Digital fabrication: Data <-> Things
- Supports creativity, invention, and entrepreneurship

Maker Literacies Program

- Multidiciplinary
- Curriculum embedded
- Competency driven
- Assessable
- Modeled loosely on ILCS and IL Framework

Maker Literacies Task Force

developing a set of assessable maker-based competencies, identify potential courses across the university's colleges to incorporate scaffolded learning outcomes, and assist faculty with maker-based curriculum development.

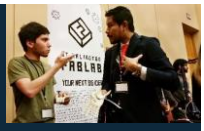
Task Force Composition

- Maker Literacies Librarian (project lead)
- FabLab Director
- FabLab Technician
- Faculty from diverse selection of academic departments:
  - Education, Engineering, Fine Arts, Science, and English
  - Represents expertise in curriculum/instruction design, plus three types of learning

Project Outline

- Spring 2016: Draft list of maker-based competencies
- Summer 2016: Identify pilot courses for test implementation
- Fall 2016-Spring 2017: Pilot test in selected undergraduate courses
- Spring/Summer 2017: assess program outcomes, refine/revise competencies, document & report best-practices for full program implementation
- 2017-18: IMLS Grant to expand and further test the program at other universities.

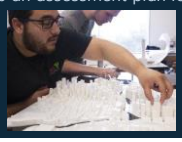
Competencies (just a few examples)

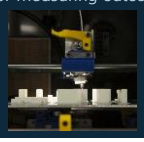


- identifies the need to invent, design, fabricate, build, repurpose or repair some "thing" in order to express an idea or emotion, or to solve a problem
- demonstrates time management best-practices
- assembles effective teams
- assesses the availability of tools & materials
- understands many of the ethical, legal and socio-economic issues surrounding making

Essential Steps

- Identify courses
- Establish learning outcomes
- Maker competencies mapped to instructor's desired outcomes
- Create or revise an existing assignment/project
- Develop an assessment plan for measuring outcomes
- Assess
- Iterate





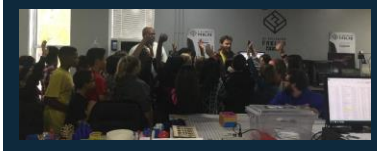
Pilot Courses

Fall 2016
ART 4392: Emerging Technology Studio
ENG 2303: Afrofuturism
ENG 3374: Writing, Rhetoric, & Multimedia Authoring
IE 4325: Automation & Robotics

Spring 2017
ART 4365: Technology in Art Education
CSE 3311: Object Oriented Software Engineering
EDUC 4333: Multiple Teaching Practices in Math & Science
ENG 3373: Technical Communication
IE 1205: Introduction to Industrial Engineering

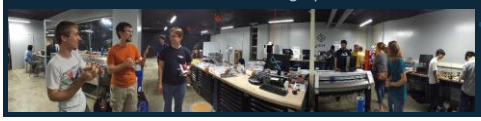
Scenarios

- Single-course
- Multi-course (and multi-disciplinary) collaboration
- Service learning models
- Faculty Fellows (teach the teacher)

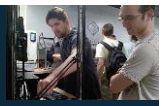


Lessons Learned (so far)

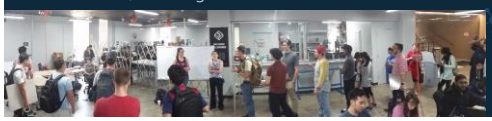
- More buy-in than anticipated
  - enthusiasm is wonderful!
  - every course requires prep time & support
- ML closely mirrors design-thinking principles
  - (education is a design process)



Challenges



- Diversifying courses beyond Engineering & Art
- Online courses
- Graduate courses
- Adding totally new skillsets to already full syllabi
- FabLab capacity
- Showing evidence of student success



Moving Forward

- Grant Opportunities
- Faculty Fellows (teach the teacher)
- Structure competencies around Bloom's Taxonomy for scaffolding
- Alignment with various accreditation criteria, statewide initiatives (60x30TX)
- Survey & focus groups
- Observational studies in the FabLab to determine teaching/learning thresholds

Questions?

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