Critical Making and Experiential Learning with 3D Printing

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Why not 3D Print?

1. 3D prints are just ‘toys’

2. 3D printing is too expensive or difficult to sustain

*Not True!!*
Product vs. Project

**Product**

Students engage with a customized 3D printed object. These created **products** are typically made by faculty or staff ahead of time and intended to shape and enhance students’ engagement with course content.

**Process**

Students engage in the **process** of 3D printing themselves, problem solving to overcome obstacles and engage with course content in new, innovative ways. Students must learn new skills (e.g. 3D modeling, 3D printing, iterative design, etc.)
Experiential Learning

Learning is the process whereby knowledge is created through the transformation of experience

D. A. Kolb, 1984
Molecular Models

David Blauch and Felix Carroll, Davidson College

Photograph by and courtesy of Felix Carroll
Viking Archeology Site

Jennifer Grayburn, UVA

Photographs by presenter, models by Snorri and Creative Tools
Critical Making

A mode of materially productive engagement that is intended to bridge the gap between creative, physical and conceptual exploration

Matt Ratto, 2011
Reproducing Ancient Monuments

Sue Ann McCarty, JMU

Photograph by and courtesy of Sue Ann McCarty
Information, Materiality & 3D printing

David Perry, St. Joseph’s University

Source: St. Joseph’s University News: https://www.sju.edu/news-events/news/3d-printing-class-communication-magic
Icons of Russia Exhibition

Kathleen Thompson and Jill Martiniuk, UVA

Photograph by and courtesy of Kathleen Thompson

Photograph by presenter, model by tc_fea
Upcoming...

Innovative Teaching with Makerspace Technology Grant

- **Biology/Medicine**: Anatomical models from CT scans
- **Architecture**: Iterative design projects to explore shape and fabrication
- **Geography**: 3D printed visualizations of networks
Upcoming...

HACLab Hall of Architecture: Copy + Paste

and

The Copy Shop

Image by Tom Little, courtesy of Carnegie Museum of Art, Pittsburgh
Getting Started

- 3D printing resources at your institution
- Relevance to course content/objectives
- Scaffolding/skill development
- Evaluation
- Number of students
  - Time/Cost
Getting Started

• Be flexible and open to learning yourself!

My first failed print