University of Texas at Arlington Libraries' Beta Maker Competencies

The "Maker-Literate" student:

1. 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.

1.a. Recognizes unmet needs that may be filled by making

1.b. Expresses curiosity about how things are made and how they work

1.c. "Hacks" and "tinkers" to learn how things are made and how they work

1.d. Evaluates the costs & benefits of making as an alternative to buying or hiring

2. Applies design praxis

2.a. Defines the problem

2.b. Analyzes the problem and breaks it into component parts acquires reliable and relevant background information identifies stakeholders

2.c. Specifies project requirements

2.d. Identifies and works effectively within project constraints, be they financial, temporal, proximal, or material

2.e. Brainstorms for a variety of solutions & chooses the best one

2.f. Evaluates the costs & benefits of using off-the-shelf parts or kits as opposed to making from scratch

2.g. Creates and tests prototypes

2.h. Revises and modifies prototype design over multiple iterations

2.i. Takes intelligent risks and learns from failures

3. Demonstrates time management best practices

3.a. Outlines project milestones and identifies dependencies

3.b. Constructs critical paths

3.c. Builds in extra time to allow for multiple prototype iterations

4. Assembles effective teams

4.a. Recognizes opportunities to collaborate with others

4.b. Evaluates the costs & benefits of "Doing-it-Together" (DIT) vs. "Doing-it-Yourself" (DIY)

4.c. Seeks team members with skills appropriate for specific project requirements

4.d. Joins a team where his/her skills are sought and valued

4.e. Solicits advice, knowledge and specific skills succinctly from experts

5. Employs effective knowledge management practices

5.a. Communicates clearly with team members and stakeholders

5.b. Restates technical and "maker" jargon in plain English documents work clearly

5.c. Uses version control to manage project outputs and documentation

5.d. Preserves project outputs and documentation for long-term access

6. Assesses the availability of tools

6.a. Elects the best tools for the job

6.b. Acquires the necessary tools or revises project to conform to tool availability

6.c. Seeks alternate tools when a required tool is not available

6.d. Creates necessary tools that can't be acquired or when an alternate is not an option

7. Assesses the availability of materials

7.a. Selects the best materials for the job

7.b. Acquires the necessary materials or revises project to conform to materials availability

7.c. Seeks alternate materials when a required material is not available

8. Demonstrates understanding of digital fabrication process

8.a. Recognizes additive and subtractive fabrication techniques

8.b. Applies 3D modeling principles

8.c. Creates 3D models using appropriate software

9. Understands many of the ethical, legal and socio-economic issues surrounding making

9.a. Demonstrates an understanding of intellectual property rights and protections

9.b. Identifies project outputs that may be protectable by trade secret, patent, trademark or copyright

9.c. Compares the costs & benefits of seeking intellectual property protections v. making project outputs open and freely available to others

9.d. Evaluates the costs & benefits of open source and proprietary systems

9.e. Recognizes and respects the intellectual property rights of other makers

10. Employs safety precautions

10.a. Seeks training for dangerous equipment and materials

10.b. Wears personal protective gear when appropriate

10.c. Teaches safety precautions to others

11. Transfers knowledge gained into workforce, community, and real world situations

11.a. Teaches what he/she knows to less experienced makers