MINDFUL MAKERS ASK THEMSELVES...

# Radical Change in Library Learning Spaces: Research on Maker Spaces

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This study examined **question prompts** as a scaffold for the development of critical technical practices in maker spaces for youth at public libraries, museums, and community-based organizations.

Maker Literacy

Critical Technical Practice

How might we help young people think creatively, critically, metacognitively, and with a deep self-awareness vis à vis their relationship with the technologies and media that they create and use?
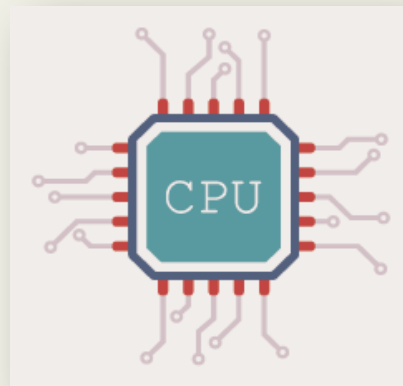
The humble question prompt!

- A socio-cultural tool.
- Skillful questioning from a teacher (or, in the case of the Maker Space, a mentor) can help learners analyze their own thinking processes, see connections, build new understanding, and support a disposition toward mindful and critical technical practices.
- With practice and modeling, learners may ask these questions of themselves, without the direct intervention of an expert.
- Question techniques are already familiar to librarians:
  - Storytelling: Dialogic reading
  - Literacy instruction: Reciprocal teaching: summarize, predict, clarify and create new questions about one's own comprehension of a text.
- Practical. Portable. Low-tech. Suitable for non-structured, informal learning.

The Fourth Knowledge

- Anderson & Krathwohl's revision of Bloom's Taxonomy, 2001).
    - Factual knowledge
    - Conceptual knowledge
    - Procedural knowledge
    - Metacognitive knowledge

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Deeper Learning
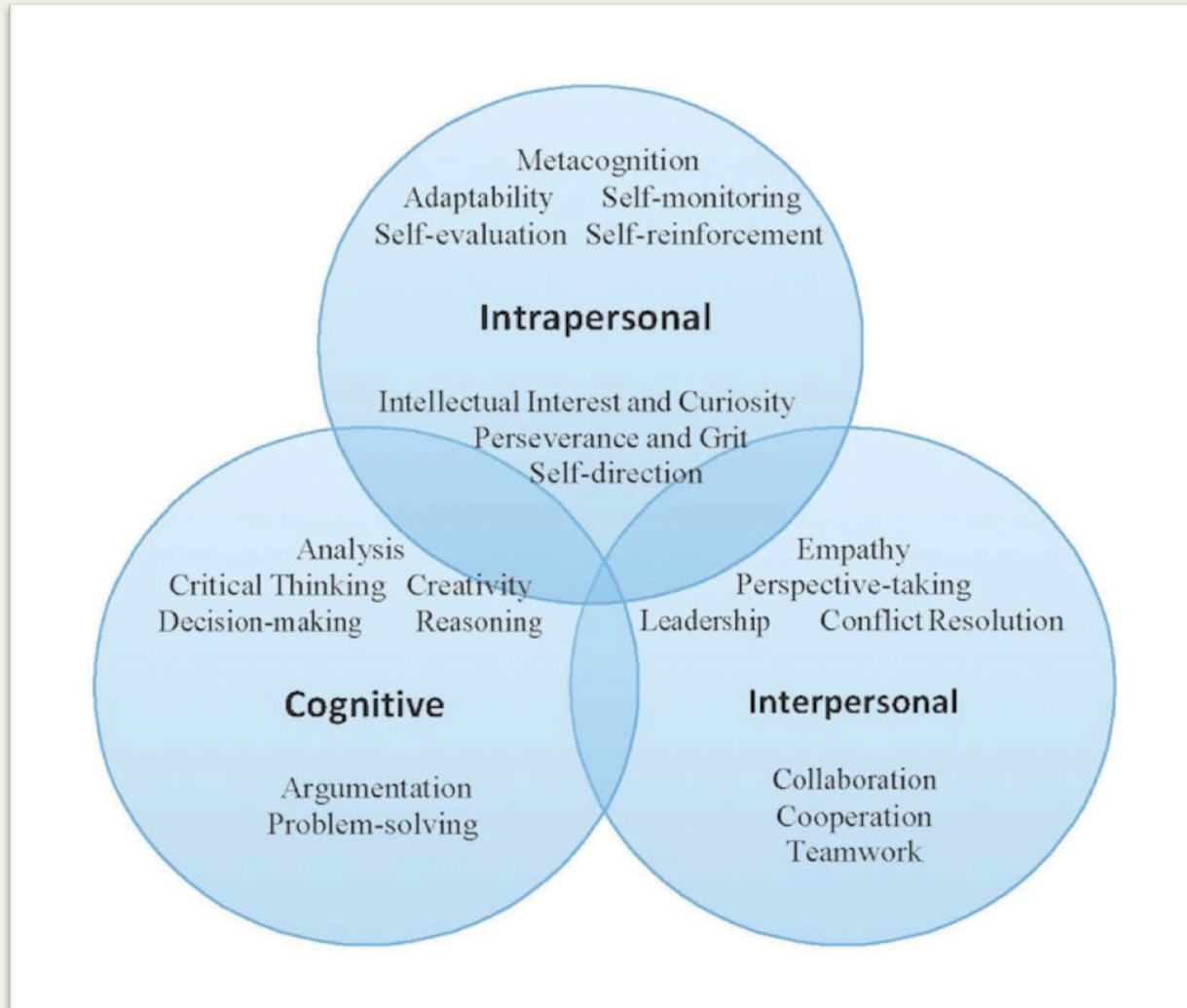
21st century skills and knowledge grouped into three broad domains.
Adapted from National Academies. (2012). *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*. Report Brief, July 2012, p. 2.

Methods

- Three sites
- Participant observation;
- Four focus groups with tweens & teens;
- Semi-structured interviews with adults (mentors);
- A series of sketching exercises.

We engaged with approximately 45 teens, six adult mentors and six administrative staff during the course of the research project.

Results

- Outcomes derived inductively from an analysis of the questions highlighted by the participants. Results include:
  - a conceptual framework for understanding critical thinking during the process of making technological artifacts;
  - A set of root questions (and underlying problematics) that offer a meaningful pathway toward critical technical practice and which would, at the same time, be authentic to youth makers.

What are the core questions that makers (and the mentors who guide them) should ask?
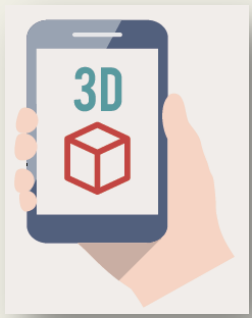
Eight core questions

- *What will make me happy?*
- *Who is my audience?*
- *What resources do I have and need?*
- *What will inspire me to give my time and effort to a project?*
- *What do I know?*
- *Can I let myself make a mistake?*
- *How will my creation affect other people?*
- *What kind of maker am I?*

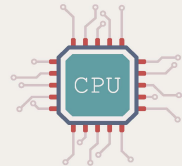# MINDFUL MAKERS ASK THEMSELVES...

WHAT RESOURCES DO I HAVE and NEED?

Mindful makers want to know what resources will serve as a muse to their imagination. Key to this is an understanding of the properties of materials.
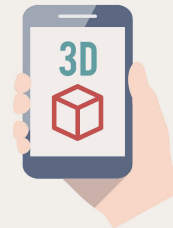
WHAT WILL INSPIRE ME TO GIVE MY TIME and EFFORT TO A PROJECT?

Sometimes we don't have the necessary skills to complete a project and need to make an effort to learn. Mindful Makers look for interesting projects that will keep them engaged and motivated (music, sports, a special cause?).

WHAT DO I KNOW?

Mindful Makers ask themselves this question throughout the making process. That way they can figure out what they don't know and take steps to learn.

WHAT WILL MAKE ME HAPPY?

A Mindful Maker is aware of the emotional connection between the maker and the objects that they make. If it makes you happy then you can have fun!

CAN I LET MYSELF MAKE A MISTAKE?

Mindful Makers understand that mistakes are ok and can make a project better. Sometimes this leads Mindful Makers to ask another question – What ways beyond the 'right' way can I make something?

WHO IS MY AUDIENCE?

Mindful Makers understand that some of their projects will be viewed, used, & shared by other people. Who are those people? Mindful Makers think about how their own interests and ideals interact with the needs of the potential audience.
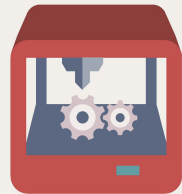
HOW WILL MY CREATION AFFECT OTHER PEOPLE?

Mindful Makers think about how their projects might affect people. Will it interest them? Will they learn something? Will they have fun? Will it make them happy or sad?
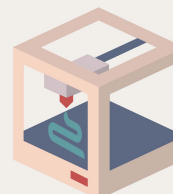
WHAT KIND OF MAKER AM I?

Maker self-awareness helps us anticipate the best way to tackle a design/build problem.

Poster and web site: http://www.mindfulmakerquestions.info/

Next Steps

- Take the "Mindful Maker" question prompts into the field and explore practical ways to insert them into the verbal interactions between mentors and young people, as well as the design of library programming in maker spaces for youth.

- Create specific guidelines, training tools, and examples for mentors, including librarians.

Acknowledgements

Many thanks to the young people and their mentors who participated in this study. Their contributions are invaluable.

Thank you!

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