GUIDING PRE-SERVICE TEACHERS TO MAKING

This research explored a guided approach to learning and practicing maker pedagogical approaches with technologies and analyzed the impact to pre-service teachers' confidence, competencies, and teaching practices. A four-tiered conceptual framework guided this qualitative, interpretive case study that used an iterative abduction analysis process to interpret the findings. Research results and educational implications are described below and may be considerations for teacher maker- or technology-focused professional development courses.

Introduction
- Our knowledge society demands adaptive skills and global competencies, but the skill gaps are growing (World Economic Forum, 2020).
- Schools are investing in tech hoping to transform student learning (Rudd, 2013), but focus is on consumption vs. creation (Rosenick, 2002).
- Maker pedagogies could disrupt educational practices and reform education organically by focusing on the underlying pedagogy vs. tech alone (Datnow, 2020).

Research Question
To what extent does guided inquiry, coupled with hands-on facilitation, promote pre-service teachers' confidence and competence with maker pedagogical approaches and influence their mindset and teacher practices?
- What challenges do pre-service teachers face, and what risks do they take to implement maker activities in their own practicum placements?

Conceptual Framework
Four theories guided this research approach and analysis:
- Constructivism, theory based on work from Piaget (1936, 1957) & Vygotsky (1978).

Methodology
- Qualitative, interpretive single-case study design.
- Seven pre-service teacher participants representing Primary/Junior & Intermediate/Senior streams.
- Research design included three phases with 18 workshops over four months.
- All three phases started with guided support & progressed to self-directed.

Data Analysis
- Multiple sources of data collected from varied perspectives. Over 450 distinct data sources including: surveys, interviews, observations & artifacts.
- This study used an iterative abduction data analysis which involved several cycles of inductive coding, followed by deductive coding, and finally searching for patterns, resulting in six categories and three data themes.

Findings

Vicarious Experiences
Community Building
External Challenges
Mastery Experiences
Emotional Transitions
Agency Building

Conclusions
- In this study building confidence and competencies in maker pedagogies & developing maker mindsets was best accomplished through a progressive guided to self-directed journey with a supportive community and the opportunities to build capacity for agency.
- While time-constrained, this guided community approach can help teachers adapt to these practices as making involves productive struggle, failure, and frustration.
- Developing agency is key as teachers will face many school challenges with making.

Detailed Report & References
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