The Impact of Teacher Beliefs on Elementary Teachers’ Use of Scaffolding in a Technology-rich, Inquiry-focused Classroom

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Introduction & Background

- This case study is driven by the need to better align classroom practice with research in the field (DiGisi, et al., 1999).
- Research posits that an effective way to initiate change in the classroom is to better understand teacher beliefs (Milner, et al., 2012; Ng, 2011).
- The ubiquitous presence of technology in the classroom offers a means through which to better understand the impact of teacher beliefs on classroom practice.
- This case study looks at external and internal factors that influence a teacher’s decisions concerning the integration of Electronic Science Notebooks (ESNs).

- Of particular interest is the concept of scaffolding:

Research Questions

Primary Research Questions

- What are teachers’ self-reported beliefs that influence their pedagogy decisions and technology use?
- How do these beliefs manifest in the classroom through established learning goals, use of instructional strategies, and/or implementation of ESNs?

Secondary Research Question

- By comparing teachers’ expressed beliefs with classroom observation, how does this inform future Professional Development opportunities?

Frameworks & Literature Review

- There are internal factors that influence teacher beliefs:
  - self-efficacy (Newton, et al., 2012)
  - expectations (Jussim & Harber, 2005)
- There are external factors that influence teacher beliefs:
  - peer group & administration (Milner et al., 2012)
  - barriers, such as time constraints (Kopcha, 2012)

- Teacher beliefs interact with technology to shape the pedagogical strategies that are employed in a classroom (Milner, et al., 2012).
- The model below represents how external and internal factors affect one’s perceived usability and utility of a tool, which ultimately impacts the way that tool is integrated into the classroom (Venkatesh & Bala, 2008).

TPACK

- The integration of technology changes a classroom (Webb, 2013).
- Integration is not guaranteed to be flawless (Drayton, et al., 2010).
- The success of tech-integration is highly dependent upon the teacher (Urhanhe, et al., 2010), particularly teacher beliefs concerning tech-integration (Ertmer, et al., 2012).
- As technology becomes more sophisticated, it offers the pedagogy to not only provide content to the students (Anderson & Slough, 2012), but also the capacity to act as a pedagogical agent and scaffold the students’ learning (Sharma & Hannafin, 2007).

- The TPACK (Technological, Pedagogical, and Content Knowledge) framework (Koehler & Mishra, 2005, 2009) offers a way to formally recognize the aspects that a teacher must consider when planning and teaching a lesson involving technology.

Data Sources & Methods

Participants: 4th grade teachers in public schools in NC (n=6)

Phase One

Baseline Interviews – Teachers were extensively interviewed concerning their current practices for using technology and providing scaffolding. They were also asked specifically about factors that they felt most influenced their decisions concerning technology use, teaching science, and promoting writing in science.

Phase Two

Classroom Observations – Teachers were observed 3-4 times when teaching with the ESNs, and they were observed 3-4 times when not using the ESNs.

Phase Three

Follow up Interviews – Baseline interviews & notes from observations will be analyzed and coded, and teachers will be asked follow up questions concerning the decisions made when teaching science, with and without the use of ESNs.

Excerpts from Interviews

Individual Differences – “I try to leave enough time… if there is time… to make time for reflection.” “I do a lot of sentence starters.”

System Characteristics – “There are certain websites that we go on… there is so much more with technology that I could use; I just don’t.”

Social Influence – “The district gives us a pacing guide, and they have our CRT sit down with us and go over what expectations are for the school year.”

Facilitating Conditions – “While we do have a SmartBoard™, it does not currently work.”

References


