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Exploring the Possibilities for Connected Learning in Pre-Service Technology Education

Introduction

Preparing future teachers to integrate technology into their teaching in ways that support successful student learning is a priority for many schools of education in the United States. The 2016 National Education Technology Plan calls on "all involved in American education to ensure equity of access to transformational learning experiences enabled by technology" (US Department of Education Office of Educational Technology, 2016, para. 1). Teacher education programs that seek to infuse technology into their curricula have used a variety of strategies to do so, including: a single course that focuses on technology; integrating technology throughout the pre-service curriculum, perhaps through the use of multimedia and e-portfolios; training education faculty, often through voluntary or required workshops; modeling strategies for teaching with technology; collaboration with public schools to set up field-based programs, often involving a teacher mentor; increasing access to technology; and various combinations of strategies (Kay, 2006).

Regardless of the approach, our current system of technology instruction in pre-service education tends to focus on functional technology skills – the ability to "do something" with technology, to know what keys to push to make something happen – an approach that has been criticized for leading to ineffective technology integration once in the classroom (Harris et al., 2009; Polly et al., 2010). This brief paper outlines a research project that I am currently conducting that explores the possibilities for connected learning as a model for the design of rich, technology supported learning in a formal, traditional education context: pre-service technology education.

Connected Learning and Teachers as Brokers

The connected learning framework views learning as powerful when it bridges three spheres of learning: peer supported, interest powered (student-designed), and academically oriented (Ito, Gutierrez, Livingstone, Penuel, Rhodes, Salen, Schor, Sefton-Green, & Watkins, 2013). Although connected learning is often associated with informal learning, Garcia (2014) argues that connected learning provides teachers with a means of shifting their teaching practice to better support students, including through the transformative use of technology.

Pre-service technology education courses are an interesting potential site for connected learning, for several reasons. Production with digital tools – the focus of most pre-service technology courses – is also one of the core properties of connected learning experiences. Assignments and projects with which the pre-service students engage in the course may provide opportunities for interest-driven learning, especially where pre-service students are encouraged to create technology-supported projects that connect to their content areas (social studies, math, early childhood, etc.), in ways that support the development of their emerging professional teacher identities.

Additionally, teachers have the potential to be learning brokers along with informal educators (Ching, Santo, Hoadley, & Peppler, 2015) and parents (Barron, Martin, Takeuchi, & Fithian, 2009, as cited in Ching et al., 2015). Instructors of pre-service technology education

courses assist their pre-service teacher students in developing not just technical proficiency, but in understanding what technological practices and positions are powerful and valued within the context of their future profession. In turn, once graduated and teaching in their own classrooms, the pre-service teachers have an opportunity to act as learning brokers for their own young students. The research project outlined below seeks to explore the potential for pre-service technology education as a site for connected learning.

Research Project

Broadly, I am interested in what it means to situate connected learning within the formal setting of the pre-service technology education course, from the perspectives of the course instructors and the pre-service teachers who are enrolled in the courses. Of the three spheres of learning, the formal classroom is the space that has the fewest natural design features of connected learning, which may present challenges for creating peer supported and interest driven experiences that cross the boundaries of academic sphere. I am also interested in how course instructors and pre-service teachers perceive their role as learning brokers within this context and, for the pre-service teachers, in their future classrooms.

Thus, the project seeks to explore the following questions:

- What does it mean to situate connected learning with a formal classroom? In what ways can the pre-service classroom (the academic sphere) be a "site of translation" for the other spheres (peer-supported, interest-powered)?
- How do course instructors understand/envision the potential for digital media to connect their students' interests, academic spheres, and peer-supported learning?
- How do course instructors understand/envision their roles as brokers of digital learning opportunities for their students?
- How do pre-service teachers understand/envision the potential for digital media to connect their own and their future students' interests, academic spheres, and peer-supported learning?
- How do pre-service teachers understand/envision their roles as brokers of digital learning opportunities in their future classrooms?
- What identities do pre-service teachers leverage within and across spheres of learning (peer supported, interest powered, academically oriented) in a connected learning classroom experience?

To examine these questions, I am currently undertaking a multi-site, multi-case study in two, stand-alone technology courses in a Mid-Atlantic College of Education. One of the courses focuses specifically on technology integration strategies for young children, and enrolls early childhood education students. The other course caters to the rest of the pre-service education majors, including elementary education and secondary/middle education. Both of the courses are required for the pre-service teachers, and each section typically enrolls approximately 18 students, primarily sophomores, juniors and seniors. I am collecting data in two sections of each course, for a total of four sections.

Over the summer, I worked with the three course instructors[1] to re-design a unit of instruction in their courses, drawing on the connected learning design principles articulated in Ito

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[1] One instructor teaches a section of both the early childhood course, and the general technology integration course.

et al.'s (2013) white paper, in order to create a connected learning experience for their students. Two of the instructors chose to re-design a unit on digital storytelling, in which students create a digital story to support the teaching of content related to their field. One instructor chose to re-design a unit on computational thinking, in which groups of students create a computational thinking game. In addition, students in all sections are creating a resource (either a screen capture, list of links, or FAQ sheet) about the process of creating their projects, to share online with students who take these courses in the future. We also built opportunities for peer support, social connection, shared expertise, and collaboration into the instructional design of the class sessions.

These connected learning experiences provide the boundaries for the case study design. Data collection includes classroom observation throughout the unit; interviews with the instructors, at the beginning and end of the semester; student learning reflections (exit tickets) at the end of each connected learning class session; a pre-service teacher focus group interview at the conclusion of the connected learning experience, in each section; and artifacts such as instructional materials, digital stories, computational thinking games, and other products created by the pre-service teachers during the connected learning experience. Data analysis will be inductive, using open coding to explore themes from the entire data set, and Gee's (2014) Discourse Analysis to explore the social identities enacted by the pre-service teachers during the connected learning experience.

Conclusion

In pre-service technology education, the connected learning framework has the potential to provide design support and direction for creating learning experiences that resonate with our digital students and our digital society. This type of learning would empower our future teachers to meet the goals of the National Education Technology Plan through technology-supported learning that connects their students to opportunities and resources within and beyond the classroom. However, little research to date has focused on the pre-service technology classroom as site for connected learning. The research described in this brief paper seeks to understand what it means to situate connected learning in this particular environment, from the perspectives of course instructors and pre-service teachers. Project results will inform the design of future connected learning experiences for pre-service teachers, as well as provide avenues for future research.

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