Chapter 22
Student-Centered Teaching with Constructionist Technology Tools:
Preparing 21st Century Teachers

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ABSTRACT

Using the theoretical framework of "craft" highlighted by Richard Sennett (2008) in The Craftsman, this chapter focuses on constructionism and the implications of project-based learning in an undergraduate-level pre-service teachers' technology integration course. The chapter evaluates an approach to teaching undergraduate pre-service teachers to teach children to use constructionist technology tools, including Web 2.0 technologies – wikis, blogs, podcasts, etc. Data were collected and analyzed to document pre-service teachers' experiences with these tools as well as to gauge their level of confidence in teaching with the technology in their future classrooms. Data collected included pre-post concept maps, pre-post preinternship interviews, and learning artifacts. Analyses show an increase in pre-service teachers' complexity of knowledge and awareness of Web 2.0 tools and skills, and a moderate impact on their beliefs about student constructionism in their future classrooms.

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INTRODUCTION

Situated in the theoretical framework known as "craft" (Sennett, 2008), this study examined the use of constructionism as an instructional design method in an undergraduate-level technology integration course for pre-service teachers at a major research university in the southeastern United States. Throughout the course, pre-service teachers experienced constructionist pedagogy by creating digital artifacts that represent their understanding, learned more about themselves and others and what they knew through the art of creating digital objects, and also gained the confidence necessary for them to integrate constructionist pedagogy and associated technology tools in their future classrooms.

The course places undergraduates in the role of creators with open-ended technology tools, addressing several challenges in digital-age teacher education. First, most undergraduate students entering teacher education programs today were born after 1985; thus, they are not only comfortable using a range of technology in their learning, but they expect technology to be seamlessly woven throughout their educational experience for meaningful and engaged learning. In support of this notion, Lippincott acknowledges that "[h]igher education needs a new framework for promoting the value of information and technology skills for undergraduate and graduate students" (2007, p. 16). Second, new teachers graduating from teacher education programs today will be expected by their students and other stakeholders to integrate an ever-evolving array of educational technology tools into their teaching. Therefore, pre-service teachers need a range of technology skills, a comfort with classroom technology integration, and the habits of mind that result in valuing innovation and experimentation with new teaching and learning tools. The intent of the course was to develop the teachers' skills in technology integration as well as a pedagogical philosophy that values student-centered tool-based teaching.

The course itself is the second of two technology courses required by the university teacher education program. The first course is taken during the pre-service teachers' sophomore year and the second is typically taken at the end of their senior year, before they enter a field experience to complete their certification requirements. In this course, the teachers are taught practical skills to use when developing curriculum for their future elementary school classrooms.

The remainder of this chapter will provide background information on the theories that helped frame the course design, and discussion of the methods and findings of the study, followed by conclusions and implications.

BACKGROUND

This section highlights the broad definitions that support the value of project-based learning with constructionist technology tools. The first subsection explains the theoretical framework of craft as it pertains to this topic.

Theory of Craft

The theoretical framework for this chapter is that of "craft." Sennett (2008) identifies craft by way of the Enlightenment period, a time when people saw a craftsman in everyone, and understanding of self was achieved by creating objects (Sennett, 2008). As Sennett says, "Every good craftsman conducts a dialogue between concrete practices and thinking; this dialogue evolves into sustaining habits, and these habits establish a rhythm between problem solving and problem finding" (Sennett, 2008, p. 9).

In this regard, teachers are craftsmen, teaching students to craft in the process of developing skills and knowledge for their futures. Teachers are rhythmic and expressive of themselves and their beliefs and philosophies, allowing them to think on their feet and make changes to better the