Introduction

The efforts to restructure America’s schools for the demands of a knowledge-based economy and to deal with the impact of globalization on America’s workforce have been redefining the mission of K-12 education and their teacher preparation programs (Partnership for 21st Century Skills, 2004). Many standards from professional organizations (e.g., INTASC, NCATE, NCTAF and NCLB) point to the importance of university faculty and quality teacher education programs in supporting the needs of pre-service teachers, particularly through pedagogies that better integrate technology into education.

Within university teacher training programs, the term pre-service teacher is commonly used to distinguish university students preparing to be teachers from the K-12 students they will ultimately serve. The improvement of technology integration in K-12 instruction has become a “national imperative” in the United States (Brown & Warschauer, 2006). Unfortunately, current professional development involving technology is inadequate to address the needs of 21st century teachers (Ansell & Park, 2003; Lawless & Pellegrino, 2007). Even within university settings where more technology is provided than K-12 institutions, many university professors often prefer antiquated means of developing lessons (Cuban, 2001; Fabry & Higgs, 1997; West & Graham, 2007).

ABSTRACT

This study evaluated the perceptions of pre-service teachers in their ability to integrate technology into a learning environment based on coursework and student teaching experiences. Pre-service teachers were surveyed using the 2008 ISTE/NETS*T standards as a framework. Results were collected across four academic years at a university that has identified technology as an underlying theme. Conclusions from the study provide an insight into technology savvy characteristics of pre-service teachers. Results also show that technology modeling and program design within a teacher education program can have a significant impact on pre-service teachers, thus improving their perceptions about their ability to integrate technology.

Keywords: 2008 ISTE/NETS*T Standards, Learning Environments, Pre-Service Teacher Training, Student Teaching, Technology Integration
Within the last decade, approximately 2.2 million teachers entered the teaching profession (Riley, 1998). However, limited exposure to technology and inadequate pedagogical integration continue to be reported as obstacles by classroom teachers (Ansell & Park, 2003; Lawless & Pelligino, 2007; Smith & Robinson, 2003). Since the goals of teacher preparation include increasing the comfort of pre-service teachers with pedagogical resources such as technology, instruction in technology is particularly important and needs to be included in higher education. Increased integration of technology in K-12 teaching is more likely to occur when prospective teachers are exposed to a variety of computer uses in the majority of their undergraduate courses (Wheatley, 2003) and integration of technology into their academic coursework (Dexter, Doering, & Riedel, 2006).

Unfortunately, the term “technology integration” has been used without a clear, standard definition (Bebell, Russell, & O’Dwyer, 2004; Belland, 2009; Hew & Brush, 2007). Many educators have used the term to differentiate between the uses of technology to make learning more effective and the use of technology to help students solve problems (Belland, 2009). Within this paper, the term is used to reference the use of technological tools in the classroom with an understanding of its relationship to pedagogy. That is, technology integration is part of the pedagogical process and instructional delivery of a set curriculum; technology does not cause learning, rather learning occurs due to effective teachers (Palloff & Pratt, 2000).

**Technology Integration in Teacher Training Programs**

The successful integration of technology has been shown to enhance student learning (Partnership for 21st Century Skills, 2004). The National Assessment of Educational Progress (NAEP) examined the frequency of computer use in schools, access to computers in homes and schools, professional development of mathematics teachers in schools, and the kinds of instructional uses of computers in schools. The study found that the greatest problem in the use of technology in schools was not how often the computers were used, but how they were used for instructional purposes by the teachers. The conclusions found within the NAEP study have been echoed by other researchers (e.g., Cradler, McNabb, Freeman, & Burchett, 2002; Pelgrum & Plomp, 2002; Wenglinsky, 1998).

While social learning theorists have pointed to the importance of modeling and imitation on learning (Bandura, 1969; Bandura & Walters, 1963; Lefrancois, 1982; West & Graham, 2007), pre-service teachers have not been receiving effective models of technology integration within the university setting (West & Graham, 2007). In addition to the lack of modeling opportunities, most of the basic instructional technology courses offered in many teacher education programs focus more on the hardware and software tools than on the methods of technology integration in teaching practices (Graham, Culatta, Pratt, & West, 2004). In fact, the majority (73%) of introductory technology courses within 53 researched higher education institutions were found to use a lecture and lab format for teaching technology integration with no prerequisite courses (Graham et al., 2004). Making the situation worse, pre-service teacher training is often disconnected from the actual use of technology within the K-12 classroom (Marion, 2003; Murphy, Richards, Lewis, & Carmen, 2005). That is, even though pre-service teachers are normally required to use technology in their teacher education program, they fail to continue to do so during student teaching as well as after they have obtained employment. While pre-service and in-service teachers’ willingness to use technologies in their classrooms would increase as their technology confidence increased (Bullock, 2004; Seels, Campbell, & Talsma, 2003; Wahab, 2009), they are less likely to utilize technology when they believe they lacked the necessary skills (Angeli & Valanides, 2004; Hong & Koh, 2002).
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