An Exploration of Pre-Service Teachers’ Intention to Use Mobile Devices for Teaching

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ABSTRACT

Teachers in the US have been increasingly adopting mobile devices for teaching, but little research has examined how pre-service teachers perceive mobile device integration in classrooms. To address this issue, the study developed a research model that explained factors affecting pre-service teachers’ intention to use mobile devices and the relationship among the factors. A total of 386 pre-service teachers participated in an online survey, and the model was tested using structural equation modeling. The results showed that 72.5% of variances in pre-service teachers’ intention to use mobile devices were explained by perceived usefulness and self-efficacy for technology integration jointly, where perceived usefulness was the strongest predictor. The findings also demonstrated that constructivist beliefs and perceived ease of use indirectly influenced pre-service teachers’ intention to use mobile devices for teaching.

Keywords: Constructivist Belief, Mobile Learning, Pre-service Teachers, Self-Efficacy for Technology Integration, Technology Acceptance Model

INTRODUCTION

Mobile technologies such as smartphones, iPods, iPads, and other tablets offer a promising and cost effective way of learning in K-12 settings and individualized assessment opportunities (Ifenthaler & Schweinbenz, 2013; Martin & Ertzberger, 2013). They also provide information-rich ubiquitous learning environments that build positive attitudes and engage teachers and students in the learning process (Ciampa, 2013; Kucirkova, Messer, Sheehy, & Panadero, 2014). A recent literature review of mobile learning studies from 2007 to the present by Liu, Scordo, Geurtz, Navarrete, Ko, and Lim (2014) found that student achievement increased with the use of mobile devices in a collection of nine studies. They also found that

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teachers showed positive attitudes toward the use of mobile devices especially in the areas of increased communication and collaboration among students. Such positive outcomes have encouraged many schools to adopt mobile devices in classrooms. For example, the Wisconsin State Journal (2014) reported that the Madison school district superintendent made a $27.7 million technology plan that gave each child in 2-12 grade a mobile device.

Researchers have claimed that an important issue is not how much technology is available in classrooms but how the devices are used to improve student learning (Ertmer & Ottenbreit-Leftwich, 2013). Teachers’ pedagogical use of technology directly determines the impacts of technology; many researchers have argued that a critical factor for successful technology integration is the teacher (Chen, 2008; Ertmer, 2005). Pre-service teachers’ mobile acceptance is particularly paramount to their successful preparation as they would play a vital role in how mobile devices would be integrated in future practices (Ifenthaler & Schweinbenz, 2013). However, despite its significance, little research has examined how pre-service teachers perceive mobile device integration in classrooms. Most current studies on mobile use investigated college students’ mobile adoption for personal learning (e.g., Cheon, Lee, Crooks, & Song, 2012; Park, Nam, & Cha, 2012), or the impacts of mobile device use on student learning (e.g., Hung, Lin, & Hwang, 2010; Lin, Wong, & Shao, 2012). Liu et al. (2014) noted that there is a need for more empirical studies about mobile learning that allow us to develop theoretically based pedagogical approaches for teachers. Although teacher education researchers have called for new models to be explored to improve our understanding of the issues around pre-service teachers’ technology integration efforts (Ertmer, 2005; Hew & Brush, 2007), factors affecting pre-service teachers’ mobile adoption are not fully examined. Thus, this study investigates key technology acceptance determinants and explores the relationship among those factors.

**LITERATURE REVIEW**

Teacher technology adoption, especially that of pre-service teachers, is a complex interaction of different influences. Studies have demonstrated a variety of factors that facilitate or hinder teachers’ technology use in classrooms such as pedagogical beliefs (Teo, Chai, Hung, & Lee, 2008; Sadaf, Newby, & Ertmer, 2012), facilitating conditions (Chen, 2010; Freidhoff, 2008; Hew & Brush, 2007), subjective norms (Cheon, Lee, Crooks, & Song, 2012), and self-efficacy (Sang, Valcke, van Braak, & Tondeur, 2010; Teo, 2009; Wang, Ertmer, & Newby, 2004). These factors are likely to be related to each other and directly or indirectly influence teachers’ decisions on technology use (Teo, Chai, Hung, & Lee, 2008). One way to examine this complicated phenomenon is to analyze possible factors based on a valid theoretical model. This study used the technology acceptance model (TAM) by Davis, Bagozzi, and Warshaw (1989) as a theoretical lens to explore pre-service teachers’ mobile adoption.

**Technology Acceptance Model**

TAM aims to explain users’ perceptions and behaviors of using information technology. According to TAM, the variables of perceived usefulness and perceived ease of use are hypothesized to be the fundamental determinants of users’ behavioral intentions to use technology (see Figure 1). Perceived usefulness is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance,” and perceived ease of use as “the degree to which a person believes using a particular system would be free of effort” (Davis, 1989, p. 320). TAM has been widely used, tested, extended, and compared with other models over the past two decades (Sun & Zhang, 2006; Teo & Noyes, 2011; Venkatesh & Davis, 2000). With the growth of mobile technology, recent studies have used TAM to examine mobile device adoption. For example, Motta, Cattane, and Gurtner (2014) have studied vocational students’ mobile de-
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