



Factors influencing students' beliefs about the future in the context of tablet-based interactive classrooms



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ABSTRACT

With the distribution of easy-to-use tablet computers, tablet-based interactive classrooms have become popular environments for innovative learning activities in recent years. However, little research has investigated the relationship between technologically enhanced learning environments and students' beliefs about the future and self-efficacy for learning. In this study, young students' perceptions of tablet-based interactive classrooms, beliefs about the future, and self-efficacy for learning in rural areas of Korea were examined after the students engaged in tablet-based interactive classrooms. To develop the theoretical framework, we created a structural research model of ease of use, usefulness, satisfaction, deepened experiences through tablet use, beliefs about the future, and self-efficacy in tablet-based interactive classrooms based on a partial least squares (PLS) method. The results indicate that (1) students in tablet-based interactive classrooms perceive frequent experiences with tablet-based instructions as easy and useful and (2) student satisfaction is significantly influenced by their perceptions of deeper learning experiences through tablet use, which are significantly influenced by their future expectations and self-efficacy for learning. This study provides relevant implications for educators who design learning activities for students in rural schools in tablet-based interactive classroom environments.

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1. Introduction

As a social equalizer that democratizes the production, dissemination, and use of information, technology can fill the educational gap between urban and rural schools by delivering education to students in rural areas with limited resources (Carnoy & Rhoten, 2002; Gee, 2009). Integrating tablet computers with a typical rural school environment may provide new opportunities and innovative experiences for students and teachers to promote motivation and positive attitudes toward students' lives. The recent popularity of tablets (e.g., the Android-based Galaxy Tab or the iOS-based iPad), which are portable and easily distributable, has created newly imagined possibilities and challenges for teachers in the classroom. In a school context, these mobile handheld devices have great potential to provide pedagogical advancements in education in rural areas (Kim et al., 2011; Zurita & Nussbaum, 2004), such as supplementary educational resources for rural schools or for lower-performing students (Attewell, 2005; Kim et al., 2011; Stead, Sharpe, Anderson, Cych, & Philpott, 2006).

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Globally, support for integrating tablets and relevant systems into classrooms has increased (Clarke, Svanaes, & Zimmermann, 2013). Governments in multiple countries have eagerly commissioned research and trials to use tablets in schools as a national project to enhance educational environments. The recognition of tablet computers as effective and efficient learning tools has led to the provision of tablet computers for individual students and the development of relevant content and apps. Some global initiatives include the following: Australia (e.g., Smart Classrooms Strategy by Queensland), the United States (e.g., Virginia, Maine), France (e.g., the Correze project), the United Kingdom (the Tablets for Schools initiative), and Turkey (the FATIİH project).

To decrease the education gap between urban and rural areas in Korea, the government has tended to support and create technology-enhanced learning environments. Providing tablet computers in schools for minimal or no cost is one strategy for decreasing digital inequality. Local school districts and governments in Korea have supported the building of tablet-based classrooms and infrastructure, including wireless capability, which is the beginning stage (Kim & Kim, 2014). A national educational project known as digital textbooks promotes a connected and interactive classroom that includes tablet computers and interactive boards. Additionally, a digital textbook consists of a variety of instructional resources (e.g., dictionary, multimedia, quizzes, and learning sources for review) and provides a multimedia learning environment that includes videos, animations and virtual-world exercises. Students and teachers can download science and social science textbooks to their tablets and personal computers from a government server using registration codes. A digital textbook is not simply a digitized paper-based textbook that expands the limited functions of paper textbooks (e.g., learning support systems, multimedia content [movie clips, animation, virtual reality, or hyperlinks]) (Kim & Kim, 2014). A major objective of successive administrations in South Korea has been to reduce inequality in access to education, and information and communication technology are regarded as critical to achieving that goal (OECD, 2011). The Ministry of Education expects digital textbooks to improve students' learning efficiency and decrease inequality between urban and rural areas and between high-income and low-income students (Kim & Kim, 2014).

Digital experience with a tablet-based classroom environment may influence students' learning processes and perceptions regarding academic engagement and attitudes. Students who are more digitally literate may have greater opportunities to improve their quality of life as well as the efficiency of social and economic organizations (Li & Ranieri, 2013; OECD, 2001, 2011; Venezky, 2000). Although tablets can be effective educational tools in a wide variety of learning environments, particularly in communities with poor educational infrastructure, little research has examined the influence of engagement in tablet-based classroom environments. Students' experience using tablets and relevant and innovative activities may improve their beliefs about the future and self-efficacy. Few studies have investigated students' perceptions of tablet-based classroom activities, including their beliefs about the future, which are known to be powerful motivators of current decisions (Nurmi, 1991), or self-efficacy, which is a critical factor driving students' academic success (Bandura, 1986a; Pintrich & DeGroot, 1990; Pintrich & Schunk, 1995). Therefore, the objective of this study is to examine how student perceptions of factors that include satisfaction, ease of use, usefulness, frequent use, and desire for learning in a tablet-based interactive classroom influence their beliefs about the future and self-efficacy.

This article is structured as follows. First, we review the literature on the effects of the aforementioned predictors of belief about the future and self-efficacy, and we propose a model. Second, the methodology used in this study, the PLS modeling approach, is presented, followed by the results and discussion sections. Finally, the conclusion summarizes our major findings and identifies future research opportunities.

2. Background and hypotheses

2.1. Learning experiences in tablet-based interactive classrooms

Recent research has emphasized that mobile technologies have great potential for creating interactive learning environments (Chan, 2010; Dede & Richards, 2012; Johnson et al., 2013; Sessoms, 2008; Terras & Ramsay, 2012). The emergence of mobile handheld devices in classroom environments can create more interactive classrooms that encourage students to actively engage in the learning process and prompt their own contributions to the learning experience (Sessoms, 2008; Terras & Ramsay, 2012). More interactive and cooperative digital learning technologies have been applied in classrooms, such as cloud service-based learning management systems, n-screen-based classroom systems, touch-screen electronic white boards with shared classroom materials, authoring tools for digital textbooks, and mobile learning resources for mobile handheld devices (Kim & Kim, 2014). Classroom activities using networked technologies can augment constructivist learning to capture the richness of the knowledge and meaning constructed and to access influential discourses and practices in the learning community (Kirschner, Sweller, & Clark, 2006; Kong, 2011; Richardson, 2003). In fact, tablet computers have recently been recognized as particularly innovative and versatile devices for learners in an educational context. The potential for tablet computers can build upon various learning experiences (Johnson et al., 2013; Terras & Ramsay, 2012). As a mobile computing device, the tablet computer is a multifunctional personal device that offers a wide range of services, such as communication, entertainment, news, social networks, and multimedia, which can be used at any time and any place using an internet connection (Poslad, 2009; Terras & Ramsay, 2012). The specialized features of tablet computers make them appropriate tools for instruction in underserved rural areas, enabling improvements in learning activities. Using these innovative devices for educational content delivery or learning support may help overcome traditional barriers and may be more engaging for

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