Online Games as a Component of School Textbooks: A Test Predicting the Diffusion of Interactive Online Games Designed for the Textbook Reformation in South Korea

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ABSTRACT
Currently, the South Korean government is in the process of transforming school textbooks from a paper-based platform to a computer-based digital platform. Along with this effort, interactive online educational games (edu-games) have been examined as a potential component of the digital textbooks. Based on the theory of diffusion of innovations, this study examined how 4th, 5th, and 6th grade students perceive an interactive online edu-game and whether or not their communication attributes predict their willingness to diffuse the game. A hierarchical regression analysis revealed that four perceptions of the innovation – relevant advantage, complexity, compatibility, and observability – were statistically significant predictors of students’ willingness to diffuse an online edu-game as indicated by the theory of diffusion of innovations, while only trialability was not. Based on these results, this study provides some implications for the diffusion of interactive online educational games as a potential component of the digital textbook.

Keywords: Computer-Mediated Education, Diffusion of Innovations, Digital Textbook, Instructional Technology, Interactive Online Game

INTRODUCTION
Encouraged by the development of Internet and computer technologies, educators and scholars have examined the potential of these technologies to improve students’ learning process by incorporating online games into classroom activities. Based on this paradigm, the South Korean government has been testing and implementing a new type of teaching method in order to transform school textbooks from a paper-based platform to a computer-based digital platform. According to the Korean government, the digital textbook project, expected
to be completed by 2015, will enable students to access their textbooks from any computer, increase students’ motivation for learning, and, as a long-term outcome, contribute to the further development of the nation’s information technology (Ministry of Education, Science, and Technology, 2010). Along with this policy initiative, online games are now considered as an important component of the digital textbook project.

With the support of the governmental initiative, selected computer game companies in South Korea have produced online educational games (edu-games) to be included in new digital textbooks. In many ways, features of the edu-games are similar to those of the current entertainment-purposed online games. For example, players can choose their own avatars (in-game characters) and access game rooms separated by different levels of academic subjects. The players can also choose whether to play a game against the computer or against other human players in cyberspace. During the game, players can communicate with each other through a chatting function in the game. While edu-games share many similarities with entertainment games, their educational contents are innovative and set them apart from games created purely for entertainment.

The popularity and variety of online gaming products as well as their appeal to young people make online games worthy of careful scrutiny for enhancing students’ learning process (Colby & Richard, 2008; Ebner & Holzinger, 2007; Yip & Kwan, 2006). In particular, interactive online games using an advanced Internet technology offer a simulated environment where a player can interact with the game environment as well as other players and present contexts that also simulate real life or a real-world experience much better than traditional paper-based education materials. These strengths of interactive online games allow students to immerse themselves in a simulated educational content and apply new knowledge to practice without fear of real life consequences (Cameron & Dwyer, 2005). Moreover, interactive online edu-games are expected to provide further educational opportunities for a game player to be connected with other players all over the world. By talking, collaborating, and competing with diverse people in cyberspace, students are more able to intimately learn and expand their knowledge of different cultures, people, and the world. Although these educational values have been highly considered in the textbook reformation project, the success of the reformation ultimately depends on whether or not such online edu-games can be successfully diffused and adopted by students.

Considering the importance of the diffusion process, this study examined how students perceive an interactive online edu-game designed to be a part of digital textbooks, focusing on the predictability of factors affecting the diffusion of the edu-game developed to teach English vocabulary to Korean elementary school students. Specifically, this study investigated 4th, 5th, and 6th grade students’ perceptions of an interactive online edu-game and their communication attributes to predict their willingness to diffuse the edu-game. From the diffusion perspective, an individual’s perception towards an innovation and his/her communication attributes greatly affect the success of diffusion and implementation of an innovation (Rogers, 2003; Dearing & Kim, 2008).

ONLINE EDU-GAME AND DIFFUSION OF INNOVATIONS

Online Games and Education

A large amount of educational research has investigated the educational effectiveness of online games in many areas, such as writing (Colby & Richard, 2008; Thomas & Brown, 2007), vocabulary, language skills (Yip & Kwan, 2006), engineering aptitude (Ebner & Holzinger, 2007), and team-based training (Nam & Zellner, 2011). Many studies have supported the idea that online games are an effective learning tool in helping students memorize, synthesize, and apply knowledge. Krasilovsky (1996) claimed that young learners who are especially entertainment-oriented are captivated...
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