Chapter 4
A Framework for Promoting Knowledge Transfer in SNS Game-Based Learning

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ABSTRACT

This chapter focuses on an important issue in SNS game-based learning, that is, learners' knowledge transfer in the ill-structured domain. The chapter offers a discussion of instructional strategies in SNS game-based learning. The discussion presented here was framed around an extensive review of the literature pertinent to the strategies and approaches in serious games. Based on the discussion a framework was proposed for serious game design which revealed the interaction between and interrelationship among the variables in serious game learning. A pilot study was conducted to test the partial components of the framework. The results supported the framework showing students' progression in knowledge transfer in a game-based learning environment. Discussions were made regarding the implications of the framework and its application in k-16 education and professional training.

INTRODUCTION

Online learning game via Social Networking Sites (SNS) has increasingly been considered a viable platform for supporting learning and scientific inquiry (Conole & Culver, 2010; Shapiro & Ossorio, 2013). Studies have demonstrated the effectiveness of SNS serious games in engaging learners in community-based activities and developing deep level thinking and application (Gadgil, Nokes-Malch, & Chi, 2012; Fraughton, Sansone, Butner, & Zachary, 2011, Squire, Mutlu, Ferris, Shapiro, & Montague, 2012). It is believed that SNS-based game can increase learners' interest, improve their conceptual understanding and application, and influence their career choice in science (Jorgensen & Grushkin, 2011). While games' popularity in informal learning situations continues to grow, adoption in the K-12 classrooms

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remains stagnant. One of the issues in regard to integrating games into classrooms is the prevalent skepticism about "their value, use and appropriateness" (Muehrer, Jenson, Friedberg, 2012, p.783). Frank (2012) points out that the risk associated with the use of games in training and education is that players "game the game," instead of focusing on their learning goals. Kenny and Gunter (2011) also noted that most games aiming at educational settings failed to incorporate important pedagogic components and that lacking sound instructional design principles found in most games destined for the classroom has resulted in a player/learner base that is engaged and entertained, but does not learn the desired content. Huang, Johnson, and Han (2013) are concerned about lacking the design principles in serious game development. They maintain that failing to consider the design principles as well as cognitive and motivational support in games can result in serious consequences pertaining to learners' cognitive process and motivation in learning.

Recent efforts have been made to focus on how SNS serious games may promote learners' knowledge transfer in learning. These efforts include cognitive and motivational support in educational computer games which has been proven to positively affect learning outcomes (Roscoe, Segedy, & Sulcer, 2013; Schrader & Bastiaens, 2012). Specific approaches have been taken to integrate cognitive and motivational elements in SNS games that range from problem-based learning to self-reflection, social networking, and motivation (Barbour & Plough, 2009; Conole & Culver, 2010; Squire, 2008). Despite the efforts to make the SNS game a robust tool for knowledge transfer, much remains unknown in regard to the underlying principles and factors that affect learners' deep learning and knowledge transfer in serious games (Berthold, Nuckles, & Renkl, 2007; Liu, Toprac & Yuen, 2009). The goals of the current chapter focus on (a) the factors that impact learners' deep learning and knowledge transfer in serious games; (b) the cognitive and affective structures that support knowledge transfer; (c) the implications of the above structures in teaching and learning. The chapter starts with a review of the existing cognitive and affective approaches in SNS game-based learning, followed by the presentation of an augmented framework that supports knowledge transfer in SNS game-based learning, and ends up with a preliminary study with some promising results in terms of supporting students' knowledge transfer. Finally, discussions were made regarding the implications of the framework and its application in k-16 education and professional training.

INSTRUCTIONAL APPROACHES IN SNS GAME-BASED LEARNING

SNS games are one of the fastest growing elements of informal, virtual learning where learners seek to achieve their goals and objectives in some limiting context (Rice, 2007). With the increasing presence of SNS games in education, especially in informal learning like museum visits, researchers begin focusing on the cognitive and affective roles in SNS games to support deep learning and knowledge transfer. A review of the existing literature reveals that approaches like problem-based learning, self-reflection, social networking, etc. have been widely used in various situations to promote cognitive and affective learning in SNS games, particularly in relation to knowledge transfer. The following section offers discussions on the existing approaches and their implications in SNS based learning games.

Following the Trail of eSports: The Multidisciplinary Boom of Research on the Competitive Practice of Video Games
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