Conceptions and Instructional Strategies of Pre-Service Teachers towards Digital Game based Learning Integration in the Primary Education Curriculum

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ABSTRACT

Teachers’ digital literacy is part of the 21st century professional competences and is an essential part of the decision-making process leading to integrate the use of technologies in the classroom according to the curricular needs. This article focuses on the teachers’ competence to integrate technologies in the classroom by analyzing their integration strategies. The teachers’ curricular integration strategies are analyzed in this article by analyzing Digital Game Based Learning (DGBL) curricular integration strategies with a group of 73 pre-service primary teachers in Université Laval (Canada). The results show the pre-service teachers selected the use of existing resources instead of the creation of new ones. The majority of the selected resources were games in the area of Mathematics. The participants discussed this strategy as the easiest way to align the digital games in the primary education curriculum. The authors discuss, at the end of the paper, the limits of this strategy and the opportunities to develop alternative ways to integrate digital games in the classroom to develop the curricular objectives such as game repurposing and the creation of digital games as a learning activity.

KEYWORDS
Curricular Integration, Game Creation, Game Integration, Games, Gamification, Learning Activity, Pedagogical Innovation, Pre-Service Teachers, Serious Games, Université Laval

INTRODUCTION

Teachers’ digital literacy has a major impact on the quality of the teaching and learning process in the knowledge society (Cartelli, 2006). However, being digital literate is not enough. Teachers should be able to align the technology integration to the learning objectives and the competences of the formal education curriculum. Newhouse (2002) states that “teachers need not only be computer literate but they also need to develop skills in integrating computer use into their teaching/learning programs” (p. 45). For that reason, this article aims to focus on the specific area of pre-service teachers’ digital literacy competence related to the capacity to integrate technologies, in general, and also in the specific context of digital games, according to the learning objectives and the competence-oriented curriculum. The curricular integration strategies are analyzed in this article by focusing on Digital Game Based Learning (DGBL) curricular integration activity developed with a group of 73 pre-service teachers (65 females and 8 males) in Université Laval, the oldest French-language university in North America, located in Québec City, Canada. The pre-service teachers’ digital conceptions and instructional strategies in order to integrate Digital Game Based Learning (DGBL) in the primary education will be analyzed as well.

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The first section of the article introduces the learning potential of DGBL. The second section of the article describes four types of DGBL integration in the curriculum and the pre-service teachers’ experience in relation to these different typologies: (1) using serious games, (2) educational gamification, (3) educationalization of entertainment games for educational purposes or (4) creating digital games as learning activities. In the third section, we discuss the teaching innovation experiences that are introduced in the pre-service teachers’ training (n=73) in order to introduce them to DGBL and develop a collaborative learning activity. The goal would be to help with the integration of DGBL in the primary education curriculum in Quebec (Canada). In the last section, we will discuss the results, the limits and the opportunities of transferability of this experience in order to invite the educational and research community to take advantage of the critical analysis of this pedagogical innovation aiming to help pre-service teachers to better integrate DGBL in primary education.

LEARNING THROUGH PLAY AND GAMES

Playing is often considered as antonym of working or learning. While working and learning are considered serious activities involving an important and socially relevant effort, playing is considered as a diversion that should be earned after a hard period of work or learning. However, researchers in the field of educational sciences and game based learning (GBL) have pointed out the importance of play in the learning process, especially with children. Learning through play allows the exploration of different types of phenomena and concepts in a controlled environment. Game rules help to scaffold the social interactions in cooperative and competitive games. Overall, games offer an organized form of play that could be mobilized for learning purposes. Research conducted over the past decades allow us to see the interest of learning through playing for both young learners (Androussou, Kourt, & Askouni, 2013; Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012), adults (Pivec & Dziabenko, 2004; Romero, Usart, & Ott, 2015) and elders (Charlier, Ott, Remmele, & Whitton, 2012).

Games as Organized Play

The game is a form of “organized play” (Prensky, 2001, p. 119), “an activity, in which participants follow prescribed rules that differ from those of real life [while] striving to attain a challenging goal” (Heinich, Molenda, Russell, & Smaldino, 2002, p. 10). A game consists of rules that describe the principles of operation between the different actors (or players), activities and the scoring system. All the players know the rules of the game before it starts, allowing them to have a framework of organized actions. Making available the different objectives and game rules should favor the flow state, since the two requirements for its appearance identified by Csikszentmihalyi (1991) would then be fulfilled: having clear goals and a feeling of control over himself and its environment. Csikszentmihalyi identifies the playing activity as one of the activities that helps players’ “achieve an ordered state of mind that is highly enjoyable” (p. 72). The learners’ engagement has been considered as a continuum with different degrees of engagement, from disengagement to the experience of flow, described by Csikszentmihalyi (1991) as the complete engagement or the absorption in an activity. In the state of flow “the sense of duration of time is altered; hours pass by in minutes, and minutes can stretch out to seem like hours” (p. 49).

From Serious Games to Gamification

The use of games for educational purposes shows a great diversity. The DGBL spectrum ranges from ad hoc designed serious digital games which combine learning objectives in a game universe with a certain cognitive and visual immersion and gameplay to gamification as “the use of game design elements in non-game contexts” (Zichermann & Cunningham, 2011, p. 1).

Figure 1 shows the core elements of serious games and the differences between serious games and gamification in educational contexts. Both serious games and gamification aim to support the learning objectives of the player/learner through a positive learning and gaming experience. In both

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