


How Could the Use of Game Elements Help Students' Affective and Cognitive Engagement During Game Play?

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ABSTRACT

Researchers have posited different types of engagement, distinguishing between behavioral, cognitive, and affective engagement and theoretical frameworks have helped explain the psychological aspects of engagement. However, game researchers should examine all types of engagement using multiple methodologies as a means to understand what students are learning from educational games during game play. Conclusive results require psychological aspects and learning characteristics to be considered, but also require a deeper understanding of the intricate links between learning and game mechanics for engagement. This article presents the findings from a qualitative study with thirty participants that focuses on the importance of affective and cognitive engagement during game play with educational games. To do this, the researchers used Ferran Alsina, a game that would help to develop learning competences of primary education skills. Researchers obtained the experiences of students through a game play session, basic game metrics, think-aloud protocol, observation and focus groups. Results shows that the game provided participants an active participation associated with both affective and cognitive engagement. Without attention to cognition the authors risk losing valuable data that relate to a student's learning. Researchers should consider multiple qualitative methodologies and game play experience analysis as student experiences are qualitative.

KEYWORDS

Educational Games, Engagement, Game Play, Learning Competences, Learning, Primary Education Program, Qualitative Study

INTRODUCTION

The study of educational games has been ongoing. Gee (2003), McGonigal (2011), Boyle, Connolly, Hainey, and Boyle (2012) and other authors have discussed the potential of games for learning, and the multidisciplinary nature of games is what helps motivate and engage users. Games are in some way engaging and this higher level of engagement can help improve the intended outcomes. Engagement is a complex concept and a fundamental construct in the psychology of motivation and digital game play (Cairns, 2016). In the literature is possible to see the benefits (Poondej & Lerdpornkulrat, 2016) and to differentiate the term into three components: Behavioural Engagement, Affective Engagement and Cognitive Engagement. In simple terms, engagement refers to a person's involvement in a specific activity. One description suggests it is a complex meta-construct with behavioural, affective and

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cognitive components that vary both situationally and dispositionally (Mills et al., 2013). Engagement encompass varying components and the main intention of this paper is to report on outcomes from study examining engagement issues with an educational game called Ferran Alsina.

This paper presents the findings from a qualitative study that focusses on the importance of affective and cognitive engagement during game play with educational games.

Researchers were able to analyze the results from thirty students from the Barcelona metropolitan area. The GIE research team created a game that would help also to develop learning skills. The game used the Catalan education curriculum to work on primary education learning competences. Previous work related to this study and game has been reported elsewhere (Contreras-Espinosa, Eguia-Gomez, & Solano, 2017).

In addition, this article discusses some qualitative methodologies, including think-aloud protocol, focus groups and observation, that can help to examine types of engagement during game play. Combining multiple methodologies can often provide better results than a single methodology and will be better at producing different information. In addition, a change in a body language, unprompted utterances and facial expressions are usually good indication that a player is experiencing a strong emotional reaction to a game (Schell, 2008). These incidents are the focus for the observing researcher, and once the participant has overcome the scenario causing this response, the participant can provide an excellent insight into their experience (Knoll, 2018). It is vital to creating high-quality games for learning. In addition, basic game metrics were used.

Research questions of interest include:

RQ1: How could the use of game elements help students' affective and cognitive engagement during game play?

RQ2: How could the use of methodologies as observation, think-aloud protocol, basic game metrics and focus groups help us to focus on cognitive and affective engagement?

This article is divided into four sections. The literature review surveys some of the pertinent related research on video games, learning competences and engagement; the following section describes the method used to develop this experience. The next section discusses the game's theme, as well as the learning skills the students may develop using the educational game. The subsequent section mentions the analysis and findings obtained. Finally, the last section draws the discussion and references. The themes emerging from the study can be relevant for designers and researchers of educational games who may wish to have an alternative lens on engagement.

THEORETICAL FRAMEWORK

Games and Learning

For decades, authors such as Gee (2003) or McGonigal (2011) have discussed the potential of games for learning, and the multidisciplinary nature of games is what helps motivate users. The concept of engagement has been related to the notions of immersion, presence, flow and absorption (Brockmyer et al., 2009). In terms of gaming, an immersive experience relates to the game's capacity to induce the feeling of actually being a part of the game environment (Wirth, 2007). Engagement is a desirable state and outcome of digital game play of its own, an important concern in people's decision-making to purchase or play particular games and an important mediator of the positive social and individual outcomes of digital games, such as learning or productive outputs (Sarkar, Williams, Deterding, & Cooper, 2017), and is related further to a wide range of elements inherent in the games. Game elements are extremely important for a better experience (Fitz-Walter, Johnson, Wyeth, Tjondronegoro, & Scott-Parker, 2017).

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