Towards a Conceptual Framework of GBL Design for Engagement and Learning of Curriculum-based Content

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ABSTRACT

This paper aims to show best practices of GBL design for engagement. It intends to show how teachers can implement GBL in a collaborative, comprehensive and systematic way, in the classrooms, and probably outside the classrooms, based on empirical evidence and theoretical framework designed accordingly. This paper presents the components needed to design an innovative GBL platform, and it describes how to facilitate learning in a gaming environment, sustain continuous learning in the gameplay, and apply the successful methodologies. In this paper, the authors discuss the overall findings of pupils and teacher surveys and classroom observations in the context of primary education (pupils ages between eight and twelve). The findings helped with guidelines design instructions of GBL for engagement and learning. By using a game-based approach best practice, teachers can embed gaming and learning principles to create engaging learning experiences.

KEYWORDS

Case Study, Commitment, Engagement, Game-Based Learning, Instructional Design, Learning, Motivation, Survey

INTRODUCTION

Research (Girard, Ecalle & Magnan, 2012; Lieberman, 2010; Pivec, 2007) reveals that there is a limited range of effective GBL programmes and too few games are built around content appropriate for schools. Often, the dominant strategy for GBL settings in primary education is the digital game-based approach (Clark, Tanner-Smith, Killingsworth & Bellamy, 2013; Connolly et al., 2012; Wastiau, Kearney & Van den Berghe, 2009; Young et al., 2012). Accordingly, most teachers reported obstacles in terms of lack of technological resources, training and support when using a game-based approach for improving pupils’ performance (Wastiau et al., 2009). This is probably because when GBL approaches were created and made available, computer game popularity, advances in games and hardware technology were the specific focus. Learning and management aspects of GBL were less or not always thought through as part of the strategic planning (i.e. the overall environment and related constraints). Thus, these conditions need some creative solutions. One of them is designing GBL for engagement. That means creating a gaming environment that enables pupils to learn independently and that sustains a continuous learning.

Consequently, we intended to develop a framework of a GBL design for engagement and learning of curriculum-based content. The purpose was to determine how GBL instructional design should
proceed for effective classroom, extended and independent learning that is accessible to most pupils in primary education. Therefore, we attempted to make sense of learning and gaming activities, processes, approaches and resources. Through the organization of these components (i.e. learning activities, processes, approaches, and resources) in a GBL environment, it would help to outline the capacities of learners to become engaged learners, that is, to learn and learn continuously.

Hence, the general objective of this study was to explore engagement in gaming and whether gameplay engagement plays an important role in pupils’ learning processes and how does engagement in gameplay influence learning, within a GBL environment. In this context, the GBL instructional design focuses on outcomes such as retention, commitment and completion. However, the complexity in identifying engagement, and how it influences learning experiences makes GBL design difficult to explain. This is mainly because it involves two large research areas: engagement in gaming, and learning. Thus, the following review look at principles of engagement in both learning and gaming.

Research Background

What is Learning

Learning involves physical motions or behaviours, and within cognitive and psychomotor learning outcomes, that is, knowledge acquisition and comprehension, and skills development (Bloom, 1956). Moreover, according to Anderson, Krathwohl and Bloom (2001), learning involves emotion or feeling, within that is affective learning outcomes (Chen et al, 2012), namely the behavioural changes, attitudes or motivation. In addition, learning is also associated to experiences (Kolb, 1984). Viewed this way, the prevalence of learning across a broad range of learning theories, types of learning and learning outcomes demonstrate that learning is a form of information processing, physical activities, and emotional experiences.

Learning Engagement

From the review of literature in learning, we regarded that the complexity of understanding learning has to a great extent been concerned with ‘learning to do’ and ‘doing to learn’ expressions. Pupils ‘learn how to do’ (e.g. learning how to read, and write), so that with the ability (e.g. reading and writing), they can learn (i.e. gaining and building knowledge, skills and behaviours). Once they have learned (e.g. able to read, and write), they are ready to use these learning skills and strategies (e.g. reading and writing skills) in the learning process; automatically or consciously in order to understand and develop interests in almost any given subjects and topics. Unfortunately, pupils may be activated to use the strategies and participate in a classroom activity, but may not have engaged in learning, that is, to become motivated, seek conceptual knowledge, social and use strategies for learning (Taylor-Izumi & Lovelace, 2007; Swan, 2003).

Engagement and Learning in GBL

Accordingly, game-based learning approach is inspired by a variety of learning strategies based on well-established behaviourist strategies, including drill and practice, trial and error, stimulation and reinforcement (Wu & Richards, 2012), and constructivist principles of learning such as learning by doing, active learning, problem-based learning (Yang, 2012) as well as gaming elements of learning principles such as goals, choices, challenge and rewards (e.g., Gee, 2004; Prensky, 2001) along with Csikszentmihalyi’s (2008) perspective of flow theory: challenge and skill levels, with the goal to engage learners.

The expanded understanding of engagement processes for learning has resulted in widespread use of the term ‘engagement’ or ‘engaged learning’. One of the strengths of gaming is that its principles and techniques potentially have such a widespread application in engagement and learning. Much GBL research (Gee, 2008, Whitton, 2010; Connolly, 2012, Bouvier, Lavoue, & Sehaba, 2014; Boyle, Connolly, Hainey, & Boyle, 2012) regards engagement as the most significant measure of pupils’
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