Chapter I

Introduction to Games-Based Learning

Stephen Tang
Liverpool John Moores University, UK

Martin Hanneghan
Liverpool John Moores University, UK

Abdennour El Rhalibi
Liverpool John Moores University, UK

ABSTRACT

Games-based learning takes advantage of gaming technologies to create a fun, motivating, and interactive virtual learning environment that promotes situated experiential learning. Many researchers now believe that this approach can better motivate present day entertainment-driven learners to more thoroughly engage in learning through meaningful activities defined in the game context as opposed to those offered using more traditional didactic approaches. This chapter describes games-based learning, the related terms and scope, current approaches, embedded pedagogies and challenges for providing high-quality education in the 21st Century.

INTRODUCTION

The 21st Century has witnessed emergent cultures such as ‘blogging’ (Khan & Kellner, 2004), file sharing (Lessig, 2004) and gaming (Pearce, 2006). These digital cultures have significantly changed the ways humans work, communicate, socialise and play and they are also affecting the way younger generations learn. It is crucial that learning is congruent to lifestyle for effec-
tive learning to take place (JISC, 2004). These changes in lifestyle are inevitable and have since introduced additional challenges to teachers in providing high-quality education.

One of the significant changes experienced in the education sector is the change of learners’ attitude and their motivation towards learning. Prensky (2005) describes these learners as the ‘engage me or enrage me’ group that comprises most of the present day learners who believe that education is a waste of time and irrelevant. Such attitudes and motivation towards learning is worrying and is one of the many factors contributing to the decline in applications to science and engineering courses experienced by education establishments worldwide despite the growing requirements for more scientists and engineers worldwide (OECD, 2006; Sjøberg & Schreiner, 2006). Other known challenges include increased diversity of learners and their learning styles, increases in what must be learnt by learners and also the highly constrained resources in education and training (FAS, 2006a).

Many believe that computer games can be used to address the aforementioned issues (FAS, 2006a; Gee, 2003; Prensky, 2001) borrowing success stories from the use of computer games in corporate and military training (Buckley & Anderson, 2006; Jayakanthan, 2002; Nieborg, 2004). The idea of using computer games in learning is not new but has been negatively affected by apocalyptic ideology on the effect of video gaming in the 1980’s (Aguilera & Mendiz, 2003; Squire, 2003). Such thoughts can be linked to the early work of Malone (1980) but only recently made popular by Prensky (2001), Gee (2003) and Aldrich (2003). Findings from initial research studies showed that computer games can be used to acquire certain cognitive abilities and improve learners’ understanding in topics presented (Aguilera & Mendiz, 2003; BECTa, 2006; Jenkins, Klopfer, Squire, & Tan, 2003). These preliminary results are convincing and have gained tremendous interest from different sectors including government, academia and industry to further explore the benefits of such opportunities (BECTa, 2006; FAS, 2006a). Many also agree that it is now appropriate to take advantage of gaming technologies to create a new generation of educational technology tools to equip learners of all ages with necessary skills through experiential learning (FAS, 2006a). It is crucial that the education sector is well-informed of the development of such innovative learning approaches and its benefits to offer high-quality education to all types of learner.

This chapter provides an overview of games-based learning by describing computer games, their application in education and training, and related terms used to describe the approach. Educational theory underpinning games-based learning, its approaches, pros, cons and challenges are then discussed before concluding the chapter with a glimpse into the future of games-based learning.

WHAT IS GAMES-BASED LEARNING?

Computer (video) games are interactive software applications created primarily for participatory entertainment purposes (Rollings & Adams, 2003). The terms ‘computer games’ and ‘video games’ were formerly referred to as PC-based games and console-based games but are now used interchangeably due to the blurring state of technology. Computer games as software artefacts combine multimedia and other computing technologies such as networking to clever use to enable the game player to experience goal-directed play in a virtual environment. A computer game can be represented by the three primary design schemas defined by Salen and Zimmerman (2003) in their conceptual framework as;

- **Rules**, which formally represent the ‘mechanics’ or operational constraints within the game construct, which in turn governs the level of interactivity within the game.