

Chapter 39

Game-Based Learning with a Dialogic Teaching Approach: A Case of Deep Learning and the Use of Spore™ in A-Level Biology Lessons

Wee Hoe Tan

University of Warwick, UK

Sue Johnston-Wilder

University of Warwick, UK

Sean Neill

University of Warwick, UK

ABSTRACT

This chapter is an instance of the deployment of game-based learning (GBL) in an upper secondary school in the UK. A retrospective case study was conducted with sixth-form students (aged 17) and their teacher. The study examines their perceptions after the use of Spore™ in their biology lessons. The teacher integrated GBL with a dialogic teaching approach to promote deep learning among the students. A surface–deep learning matrix was created to extract the students' attributes as deep learners and to identify the teacher's characteristics. A comparison is presented between the perceived advantages of GBL, the normal learning approach, and how the students see teachers who use technology in teaching. The chapter focuses on the discussion of issues associated with the choice of focus group as a research method and the practice of GBL in the 14–19 context.

INTRODUCTION

The inclusion of games into the classroom is not a recent phenomenon. According to early

research conducted by members of Society of the Advancement of Games and Simulation in Education and Training (SAGSET), the use of games in the classroom became popular in the 1960s (Taylor & Walford, 1972). As computer technologies evolved, and changed many facets

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of education, the options and focus of games used in education gradually shifted from non-electronic to electronic, and then from non-networked to networked, and more recently from a stationary platform to a mobile platform. Along with these changes, many innovative ideas emerged such as edutainment, serious games, virtual learning environments, and game-based learning (GBL), to name a few. Among these innovations, GBL in education and training has captured the attention of academics in higher and further education and practitioners in the game industry since 2003 (JISC, 2007).

GBL is a form of learner-centred learning that uses electronic games for educational purposes (Tan et al., 2008). Adapting Yilmaz's (2008, p.36) definition of learner-centred learning, GBL "urges learners to actively construct meaning and understanding during every phase of the learning process". In other words, it serves as a means to achieve learning outcomes in the constructivist learning theory tradition. However, such use of electronic games in GBL usually follows a pragmatic approach, which claims no commitment to any one system of philosophy or reality (Merphy & Rorty, 1990). Instead of questioning the principles of GBL, the use of electronic games for educational purposes tends to relate to practicality and feasibility. In this sense, either serious games or leisure games might be used in education as long as the targeted learning outcomes could be achieved. Therefore, instead of investing resources to demarcate the boundaries between serious games and leisure games, this chapter focuses on an example of improving learning through using GBL combined with a dialogic teaching approach, which emphasises the need for pupils to take part actively in the dialogue of the classroom in order to learn more effectively. According to Wegerif (2006), the idea of dialogic teaching emerged from the use of dialogue as a shared enquiry, as a way of writing and as a way of knowing—ways in which both the processes

and the aims of education can be understood, as proposed by Bakhtin et al (1986).

Surface–Deep Learning Matrix

One of the key potentials of GBL combined with a dialogic teaching approach is its capability to promote deep learning. The concepts of surface learning and deep learning have been developed since the 1970s (Beattie et al., 1997). Surface learning emphasises rote learning and lack of reflection upon or understanding of the purpose of study (Simms, 2006). Standardised examinations in education are commonly criticised for overly promoting surface learning (Tan & Xu, 2009). Meanwhile, deep learning is an approach to learning in which learners gain a thorough understanding by making connections with previous knowledge and examining evidence (Entwistle, 2000). Learners are enabled to transfer knowledge and skills gained in one learning experience to other situations through personalization of the learning process (Simms, 2006). This personalization involves the transformation from passive recipient of knowledge to active inquirer. Entwistle (2000) identified deep learners as learners who

- play an active part in every facet of the change process, from design to implementation;
- approach knowledge and learning by relating new knowledge to previous knowledge; this is referred to as knowledge transformation;
- have the intention to gain a thorough understanding by making connections with previous knowledge and examining evidence.

These characteristics are echoed by Atherton (2005) who describes deep learners as self-motivated, flexible and independent learners, who associate theoretical ideas to daily experience; connect and differentiate evidence and argument;

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