Computers & Education 69 (2013) 474–484

Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Students' attitudes toward playing games and using games in education: Comparing Scotland and the Netherlands

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ARTICLE INFO

Article history:
Received 22 June 2012
Received in revised form
17 July 2013
Accepted 18 July 2013

Keywords:
Computer games
Empirical evidence
Motivations
Comparative study
Education

ABSTRACT

Games-based learning has captured the interest of educationalists and industrialists who seek to exploit the characteristics of computer games as they are perceived by some to be a potentially effective approach for teaching and learning. Despite this interest in using games-based learning there is a dearth of empirical evidence supporting the validity of the approach covering the wider context of gaming and education. This study presents a large scale gaming survey, involving 887 students from 13 different Higher Education (HE) institutes in Scotland and the Netherlands, which examines students' characteristics related to their gaming preferences, game playing habits, and their perceptions and thoughts on the use of games in education. It presents a comparison of three separate groups of students: a group in regular education in a Scottish university, a group in regular education in universities in the Netherlands and a distance learning group from a university in the Netherlands. This study addresses an overall research question of: Can computer games be used for educational purposes at HE level in regular and distance education in different countries? The study then addresses four sub-research questions related to the overall research question:

- What are the different game playing habits of the three groups?
- What are the different motivations for playing games across the three groups?
- What are the different reasons for using games in HE across the three groups?
- What are the different attitudes towards games across the three groups?

To our knowledge this is the first in-depth cross-national survey on gaming and education. We found that a large number of participants believed that computer games could be used at HE level for educational purposes and that further research in the area of game playing habits, motivations for playing computer games and motivations for playing computer games in education are worthy of extensive further investigation. We also found a clear distinction between the views of students in regular education and those in distance education. Regular education students in both countries rated all motivations for playing computer games as significantly more important than distance education students. Also the results suggest that Scottish students aim to enhance their social experience with regards to competition and cooperation, while Dutch students aim to enhance their leisurely experience with regards to leisure, feeling good, preventing boredom and excitement.

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http://dx.doi.org/10.1016/j.compedu.2013.07.023

1. Introduction

Before investigating whether computer games can be used as a suitable mechanism for educational purposes in Scotland and the Netherlands at either distance or regular HE level it is appropriate to attempt to define what games-based learning actually is and discuss where it fits in relation to other relevant terms in the literature such as games, simulations, computer games, video games, simulation games and serious games. Hainey, Connolly, Stansfield, and Boyle (2011a) point out that defining the term "game" is very difficult as there is no real consensus on shared terms and as a result of the term "game" covering a wide range of activities. A large number of definitions of games have been proposed. For example, Juul (2005) states "A game is a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels emotionally attached to the outcome, and the consequences of the activity are optional and negotiable." Crawford (1984) states that a game is a "*closed formal system that subjectively represents a subset of reality.*" On the other hand, Dempsey, Haynes, Lucassen, and Casey (2002) define a game as "… a set of activities involving one or more players. It has goals, constraints, payoffs, and consequences. A game is rule-guided and artificial in some respects. Finally, a game involves some aspect of competition, even if that competition is with oneself." When considering all of the definitions of games proposed, the main characteristics of games are that they are voluntary, generally enjoyable, activities (mental, physical or both). They have particular goals and various methods of achieving these goals which are subject to rules and constraints. Games can be played cooperatively or competitively in groups, in pairs or individually. Games generally do not have any real life consequences outside the boundary of the game.

Complexity can be added when attempting to define a game when the term is prefixed with other terms such as "computer" or "video" to make the terms "computer game" and "video game". The term "computer game" generally refers to a game that is played on a computer and the term "video game" generally refers to a game that is played on a console. Smed and Hakonen (2003) define a computer game as "*a game that is carried out with the help of a computer program.*" Esposito (2005) defines a video game as "*a game which we play thanks to an audio-visual apparatus and which can be based on a story.*"

The term "simulation" generally refers to a representation of a real system, an abstract system, an environment or a process that is electronically generated. Crookall and Saunders (1989) view a simulation as a representation of a real world system that may focus on a specific aspect of reality. Grendler (1996) suggests that simulations can either be symbolic or experiential. Experiential simulations involve the participant being immersed in a complicated, ever altering environment where they play and active part and assume a particular role that requires them to execute problem solving strategies. Symbolic simulations are more for the purposes of prediction and projection. The learner may perform a number of tasks such as predicting the outcome of a particular course of simulation but are external to the events that evolve.

As the name implies a "simulation game" encompasses aspects of simulations and games and the overlap produces the term 'simulation games' although Kriz (2003) provides a more precise definition of simulation games as "*representing dynamic models of real situations (a reconstruction of a situation or reality that is itself a social construction). Simulation games help to mimic processes, networks, and structures of specific existing systems. In addition to mirroring real-life systems, simulation games incorporate players who assume specific roles*."

The terms "games-based learning" and "serious games" are sometimes used synonymously; however games-based learning is really a subset/branch of serious games. Kaufman and Sauve (2010) define a serious game as "*a mental contest, played with a computer in accordance with specific rules which uses entertainment to further government or corporate training, education, health, public policy and strategic communication objectives.*" Tang, Hanneghan, and El Rhalibi (2009) generally define games-based learning as "an *innovative learning approach derived from the use of computer games that possess educational value or different kinds of software applications that use games for learning and education purposes such as learning support, teaching enhancement, assessment and evaluation of learners.*" Hainey et al. (2011a) discuss some of these previous definitions and others in more detail to provide a useful diagram to disentangle the terms surrounding games-based learning in the literature and show where games-based learning and serious games fit in relation to games, simulations, computer games, computer simulations, simulations games and computer simulations. The diagram is presented in Fig. 1.

The potential of video games for education has captured the interest of academics and industrialists. Amplified by the successes of the video game industry, educational games have gained in volume and influence (Klopfer, Osterweil, & Salen, 2009). Games have demonstrated that they can provoke active user involvement through exploration, experimentation, competition and co-operation. According to Garris, Ahlers, and Driskell (2002) the gamer gets 'hooked' in a series of triggered cognitive processes that have been proven to be beneficial for learning. Games support learning because of increased visualisation and challenged creativity. Importantly, games have become widely adopted by new generations of users, the so-called digital natives, who have grown up immersed in new communication technologies (e.g. Aldrich, 2004; Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012; Garris et al., 2002; Gee, 2003; Prensky, 2006; Quinn, 2005; Salen &

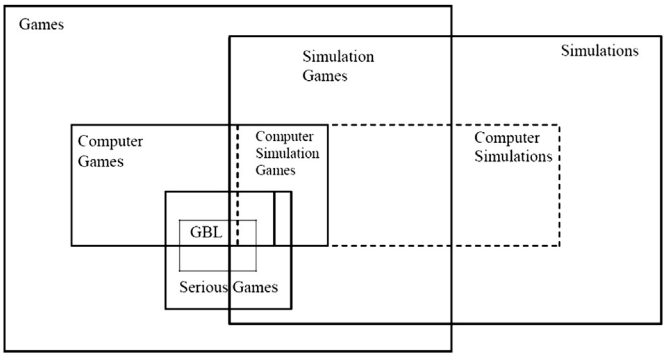

Fig. 1. Position of games-based learning and serious games in relation to related terms in the literature.