

Gamification Design Elements in Business Education Simulations

Torsten Reiners

School of Information Systems, Curtin University, Australia

Lincoln C. Wood

Auckland University of Technology, New Zealand & School of Information Systems, Curtin University, Bentley, Australia

Sue Gregory

University of New England, Australia

Hanna Teräs

Curtin University, Australia

INTRODUCTION

While there are many teaching methods available to modern educator, here we focus on one: the use of computer-based simulations. These simulations can be designed to effectively support business education in the Higher Education Sector (HES). Careful use of both information systems and technologies can create an immersive, engaging, and authentic environment in which learners are encouraged to participate in the educational process and therefore have higher knowledge retention from the learning process; it is well known that students retain more information when immersed in activities than they do from lectures.

It is nearly impossible to reflect the complex, diverse, and multi-faceted nature of real-world businesses in a classroom using textbooks and lecture slides. Multiple organisations are deeply interlocked within a supply chain and decisions can have unexpected consequences; changes to the system can have a destructive outcome with immense capital loss. The system is influenced by external factors; e.g., weather, accidents, or market shifts. Even if we assume that a decision could be based on a complete understanding of all variables including a deterministic prediction of the future, it would not be applicable as the transaction costs generally exceed the benefit. Still, business education has to train the skill to make good decisions. Simulation allows us to immerse the learner; including stressful situation as it is the case with pilot training. It

is crucial that the learner realise that decisions have to be made within short times with the danger of major (positive and negative) impacts; resulting in crashing a plane or causing a loss of millions of dollars and the lay-off of employees.

Simulation models are successfully used to train learners in business education. Nevertheless, we will demonstrate that simulation must encourage the learner to be engaged and motivated to explore the solution space being defined by the large variety of possible decisions that can be made (Jackson, 1959). Games provide an environment in which learners are encouraged to become better with every round, and failure is considered to be a learning tool rather than a risk for the survival of the business. Goldsmith and Mann (1948) created the first electronic game with the objective of hitting targets, reasoning that “skills can be increased with practice and the exercise of care contributes to success” (Goldsmith & Mann, 1948, p. 1). The games are often judged by experienced referees and focus on decisions that affect the day to day management operations of an organisation. Executive games and specialised decision-making games that deal with production scheduling, inventory control, and negotiating are discussed in detail. We assert that using these games in management training programs increases the work quality.

This article addresses the use of simulations in business education by discussing the role of authentic learning, gamification, and game-based elements in

DOI: 10.4018/978-1-4666-5888-2.ch298

the simulation design. Together, these elements can significantly enhance learner enjoyment while boosting learning and training outcomes.

SIMULATION DESIGN TO SUPPORT EDUCATION OUTCOMES

Simulation design is an important topic in contemporary education as the use of simulations has increased in popularity. It engages learners and provides new approaches to learning, extending existing active learning approaches (Wood & Reefke, 2010) and can be used in classrooms or between lessons. Simulations take many forms, from token-and-paper-based simulations to elaborate, virtual-worlds-based simulations. These approaches are not without controversy as, over the last decade, virtual worlds have struggled to distinguish themselves as distinctly different to ‘games’ (Constable, 2008) and mature enough for serious simulation (Wriedt, Reiners, & Ebeling, 2008). Gaming has been used to “aid the development of subject knowledge and learning collaborative skills such as problem solving and teamwork” (Edmonds, 2011, p. 20). An example of simulation in higher education settings would be when one is studying to become a surgeon. When a surgeon makes an error in a real surgery room there are serious consequences. However, if one were to train using simulations that are authentic (compared to theoretical learning material or studying on a corpse), where it is perceived to be a real life training environment, then learning occurs without negative consequences (Brookes & Moseley, 2012).

Businesses have set up in virtual worlds in order to increase their profits and HES institutions have used virtual worlds to demonstrate business management in authentic settings. Carr (2007) discusses how many business organisations have ventured in to the virtual world of Second Life in order to sell their products. HES institutions have followed suit to teach their students models of business in a virtual world without minimal outlay. Southern Cross University created several islands in Second Life to teach authentic business skills. Ellis, Hassett and Rowe (2009) describe the creation of an authentic virtual world based on their real campus, enabling students to interact with the tools in the island as they are able to on the real

campus. They also house a ‘Commerce Town’, used in business simulations (Gregory, Lee, et al., 2010).

Authenticity

Authentic education is a pedagogical model based on learning occurring within environments where practices and actions replicate those found in true-to-life situations, forcing learners to engage with similarly authentic materials and responses before receiving valuable feedback (Herrington & Herrington, 2006; Herrington, Reeves, & Oliver, 2010). Authentic learning is a complex integration that is profoundly different to traditional educational approaches; careful design processes are required that addresses all of design, creation, acquisition, presentation, evaluation, and assessment methods and strategies that may be used. The approach is valuable in contemporary education as it enables an environment to mould learners in a way that the information is transformed into knowledge, supported by complex communication, reflective judgement and expert thinking. Furthermore, traditional instructional education fails to address the higher levels of cognitive, affective and conative domains (Snow, Corno, & Jackson, 1996), which can be overcome with effective authentic business simulation. Authentic learning is contextual learning - that is, putting the learning into context. Authentic learning through gamification enables the learner to make mistakes in context without the real life consequences (Brookes & Moseley, 2012). Scaffolding takes places so that students learn before learning with real subjects or activities (Brookes & Moseley, 2012; Gregory et al., 2011).

Nine essential determinants describe authentic learning (Herrington & Oliver, 2000): authentic context, authentic tasks, access to expert performances, multiple perspectives, collaborative knowledge construction, reflection, articulation, scaffolding and coaching, and authentic assessment. Such learning is strongly influenced by the learning environment (i.e., the scenario that the instructor has selected to support the learning and the needs that are driven by this choice) and the established structures of educational institutions that were usually established for a different educational era (e.g., the industrial or post-industrial economy). Authentic educational design requires access to appropriate processes and resources (e.g., suitable training for

12 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/gamification-design-elements-in-business-education-simulations/112730

Related Content

3D Reconstruction of Ancient Building Structure Scene Based on Computer Image Recognition

Yueyun Zhu (2023). *International Journal of Information Technologies and Systems Approach* (pp. 1-14).

www.irma-international.org/article/3d-reconstruction-of-ancient-building-structure-scene-based-on-computer-image-recognition/320826

Automatic Emotion Recognition Based on Non-Contact Gaits Information

Jingying Wang, Baobin Li, Changye Zhu, Shun Liand Tingshao Zhu (2018). *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 132-143).

www.irma-international.org/chapter/automatic-emotion-recognition-based-on-non-contact-gaits-information/183728

3D Reconstruction of Ancient Building Structure Scene Based on Computer Image Recognition

Yueyun Zhu (2023). *International Journal of Information Technologies and Systems Approach* (pp. 1-14).

www.irma-international.org/article/3d-reconstruction-of-ancient-building-structure-scene-based-on-computer-image-recognition/320826

Health Information Technology and Business Process Reengineering

T. Ray Ruffin (2015). *Encyclopedia of Information Science and Technology, Third Edition* (pp. 3355-3365).

www.irma-international.org/chapter/health-information-technology-and-business-process-reengineering/112766

Target Tracking Method for Transmission Line Moving Operation Based on Inspection Robot and Edge Computing

Ning Li, Jingcai Lu, Xu Chengand Zhi Tian (2023). *International Journal of Information Technologies and Systems Approach* (pp. 1-15).

www.irma-international.org/article/target-tracking-method-for-transmission-line-moving-operation-based-on-inspection-robot-and-edge-computing/321542