Business Simulation Games as Digital Tools for Supporting School Entrepreneurship Education

Hercules Panoutsopoulos1,3, Maria-Anna Lykourentzou1,2, Demetrios G Sampson1,2

1Department of Digital Systems, University of Piraeus, Piraeus, Greece
2Informatics and Telematics Institute, Centre for Research and Technology Hellas, Thessaloniki, Greece
3Doukas School, Marousi, Athens, Greece

e-mail: herculespanoutsopoulos@gmail.com, may_lyk@windowslive.com, sampson@unipi.gr

Abstract— During the last few years there has been considerable interest for digital game-based learning. This interest can be attributed to the increased popularity of digital games among school students, as well as to their potential as effective learning environments for collaborative learning-by-doing activities. On the other hand, fostering entrepreneurial mindsets through teaching and learning has been a key priority for entrepreneurship education in Europe. The aim of this paper is to study the potential use of a commercial business simulation digital game, namely “Sims 2 – Open for business”, in school entrepreneurship education drawing links with standard curriculum math teaching.

Keywords-component; digital game-based learning; school entrepreneurship education; school math teaching

I. INTRODUCTION

Digital game-based learning is a research field within the wider area of technology-enhanced learning that has attracted the interest of both the research and educational community [1]. Connolly and Stansfield [2] define digital game-based learning as “the use of a computer games-based approach to deliver, support and enhance teaching, learning, assessment and evaluation”.

The interest of using digital games as learning tools can be first of all attributed to their increased popularity among school students [1]. Furthermore, digital games are considered to be effective learning environments, since they create authentic and meaningful contexts in which players have the opportunity to apply and develop higher order cognitive skills [3]. Such skills are strategic thinking, planning, communication, handling and application of data, negotiation, group decision-making, and problem-solving [1, 3].

Entrepreneurship is defined [4] as “a dynamic and social process where individuals, alone or in collaboration, identify opportunities for innovation and act upon these by transforming ideas into practical and targeted activities, whether in a social cultural or economic context”. European Commission has identified fostering entrepreneurial mindsets through education and learning as a key priority for entrepreneurship education in Europe. Thus, there is a need for technology-supported educational innovations at school education aiming at stimulating entrepreneurial mindsets among school students and facilitating them acquire relevant competencies required by the knowledge society [5]. To this end, engaging students in meaningful activities, which allow them to draw links between entrepreneurship and standard curriculum mathematics educational objectives, bares the potential for facilitating understanding of key mathematics concepts. Within this context, the aim of this paper is to study the potential use of a commercial business simulation game, namely “Sims 2 – Open for business”, in school entrepreneurship education drawing links with standard curriculum math teaching.

II. LITERATURE REVIEW

Research within the field of digital game-based learning is concerned, among others, with the investigation of methods of utilizing either general-purpose commercial, or specially-designed educational, digital games as tools for supporting learning in both formal and informal educational settings [1].

In particular, there are some efforts to exploit digital games in technology-supported teaching and learning of financial management and/or entrepreneurship. Whitton [3] describes a scenario of educational activities, built around an online game (namely “Marketplace”) and implemented as part of a university marketing course. Participating students were prompted to work in groups, make decisions regarding the management of a virtual enterprise, and perform actions such as undertaking market analysis, designing marketing strategies, and designing products for sale. Negotiation, group decision making, and strategic thinking and planning, are considered as key skills which are intended to be developed by the implementation of game-supported educational interventions targeting at enhancing entrepreneurship education [6]. Sandford et al. [7] describe an educational design, fully supported by a commercial digital game (namely “Roller Coaster Tycoon”), targeting at engaging secondary school students in activities related to the management of an entertainment park. In the context of school-based education, Chen et al. [5] also propose a game-supported learning environment (namely “My-Investment”) for the introduction of primary school students to issues related to financial management, such as bank deposits, interest rates, stock market investments, stock shares, and use of credit cards.
III. OUR STUDY

A. Selected Digital Game and Pedagogical Framework

For the purpose of our study we propose an educational design fully supported by a popular commercial business simulation game. This digital game is “Sims 2 – Open for business”, which allows players to adopt the role of a manager enabling them to perform activities related to shaping prices of products, assigning tasks to employees, monitoring data regarding the business’ status, and keeping customers satisfied. In other words, the game bares the potential to engage players in activities that constitute key objectives of entrepreneurship education [6]. Moreover, by grounding the game-supported activities with a project-based learning pedagogical approach, the features of the digital game can be aligned with the intended educational objectives and thus facilitate their achievement.

B. Describing the Scenario of Educational Activities

The main objective of the proposed game-supported educational design is to introduce junior high school students to the world of business and economics. To this end, students are asked to work in groups in order to undertake a virtual enterprise, perform specific activities as part of managing their enterprise and evaluate the results of their actions. The members of each group can select a certain type of business to start by providing a rationale for their choice. They are prompted to circularly adopt the roles of a sales manager, a marketing manager, and a human resources department manager, as well as to propose, negotiate, and decide specific activities to be performed, as part of their enterprise’s management. Feedback provided from game menus can stimulate activities targeting at providing explanations on observed results and evaluating their impact on the virtual enterprise’s status. Furthermore, by assigning students the investigation of relationships between certain game variables (e.g. wholesale cost and retail cost of a product), we offer the opportunity to work out arithmetic examples, handle numerical data in tabular form, and draw graphs, thus discover, by using multiple representations, the algebraic equations which describe these relationships.

C. Case Study

The purpose of our study is to investigate the potential use of a commercial business simulation game, namely “Sims 2 – Open for business”, in school entrepreneurship education and evaluate its impact on the achievement of related educational objectives. To this end, our case study investigates the following issues: (1) Is the proposed game-supported educational design more effective than a non-gaming approach with regard to the achievement of entrepreneurship educational objectives? (2) Is the proposed game-supported educational design more effective than a non-gaming approach with regard to drawing links between school entrepreneurship education and standard curricula math teaching? (3) Do students develop more positive attitudes towards school math teaching and learning when engaged in the proposed game-supported educational activities? (4) Does the proposed game-supported educational design significantly affect students’ attitudes towards entrepreneurship?

The method which is considered as appropriate for the investigation of the above research questions is field experiment with one experimental and one control group. Subjects of the research are secondary school students attending the second grade of a private junior high school in Greece and they are randomly assigned to the two groups. The employment of pre-tests and post-tests targets at gathering quantitative research data regarding participating students’ background knowledge, as well as the achievement of intended educational objectives after the implementation of the game-supported activities. Questionnaires are also used in order to investigate the impact of the proposed game-supported educational design on students’ attitudes towards school math teaching and learning, and entrepreneurship.

IV. DISCUSSION - CONCLUSIONS

Apart from the novelty and entertaining character of game-supported educational interventions that can motivate students, situating activities within meaningful contexts bares the potential for increasing interest towards specific subject matters [3]. The evaluation of the proposed game-supported educational design is expected to highlight issues regarding its positive impact on the achievement of entrepreneurship educational objectives, as well as the potential for providing an authentic learning context which allows for drawing links with standard curricula math teaching and thus leading to the development of more positive attitudes towards school math teaching and learning, as well as entrepreneurship education.

REFERENCES


