Journal of Modern Education Review, ISSN 2155-7993, USA
February 2021, Volume 11, No. 2, pp. 187–191
Doi: 10.15341/jmer(2155-7993)/02.11.2021/005

http://www.academicstar.us

Innovation in the Classroom: Game-Based Learning by Creating a Business Simulator as a Teaching and Learning Strategy

Antonio Salazar Campos[1], María del Refugio Mendoza Rico[2], Lugardo Salazar Campos[3]

((1. Faculty of Business Administration, Universidad del Istmo, Campus Ixtec, Oaxaca, México;

2. Faculty of Administration, Instituto Tecnológico y de Estudios Superiores de Salvatierra, Salvatierra, Guanajuato. México;

3. Faculty of Economics and Finance, Instituto Tecnológico de Sonora, Ciudad Obregón, Sonora, México)

Abstract: Currently, the business' teaching within the classroom must be accompanied by intensive practice to manage decisions collaboratively. Gamification or serious games in the teaching of business promote creativity, interest, collaboration, competence and achievement, promoting the motivation for business' learning with positively impacting in teacher's teaching.

Key words: knowledge, educational innovation, business simulation, serious games

1. Introduction

Innovation is a concept currently used in business, corporation and individual circles, regarding what Schumpeter (1963) states, the definition of innovation is the action of endowing resources with a new capacity to create economic and social value; in addition, he mentions the process of creative destruction as part of the process of positive changes in
an organization.

Moreover, innovation is the key to the creation of new knowledge, products and processes, becoming an obligation in the life of organizations, as mentioned by Larrea (2006), by which a mechanism of strategic differentiation (Drucker, 1985) is achieved.

Innovation is not only a reference in the automotive, aerospace or technological industries, it is also a precedent within the educational sector. According to Lane (2007), from ancient Greece when Philip found in the knowledge of Aristotle the way to guide his son Alexander to directing the kingdom of Macedonia, the application of knowledge has been a benchmark in countries as a driver of growth and prosperity of the inhabitants of a society; however, nowadays applying knowledge within the classroom implies generating strategies that impact on the effectiveness of performance of the students.

The key elements in teaching are based on lecturing, focused on the analysis, and the elaboration of exercises and generation of group or individual assignments, the above represents the traditional teaching scheme.

Now, the purpose of involving innovative elements in teaching is to stimulate creativity, relate current issues generating group analysis in order to work on knowledge management through efficiency in decision making.

Antonio Salazar Campos, Ph.D., Faculty of Business Administration, Universidad del Istmo, Campus Ixtec; research areas: education and business & economics. E-mail: asalazar@bianni.unistmo.edu.mx.

According to Sanchez (2015), the implementation of information technologies to education requires the anthropological, cultural and pedagogical foundation for an efficient participation without forgetting the training process of teachers.

Now, through the use of programming languages to develop a serious game that includes concepts, examples, business case exercises related to the class, the student must study the related topics before starting with the serious game; in this way, previous knowledge is acquired to work as a team by answering the questions corresponding to the topic, such questions are random and free of concept repetition, which motivates interest in each position played. In the end, the team that scores most points, the equivalent of money in the game, will be the team with the highest productivity in knowledge.

2. Theories Related to the Topic

The current challenge of education is to transform the knowledge acquired into practical solutions that allow to manage decision-making in an assertive way, in a competitive environment such as business, decision-making should involve less time and involve various organizational areas. For a correct decision making with a minimum of error due to the same variation in uncertainty, it is necessary that theoretical knowledge is transformed into practical knowledge where teamwork, group decision-making, immediate response capacity and skills of analysis are encouraged. In the modern world, students trained in the classroom have grown up with the intensive use of disruptive technologies, calling that generation as digital natives. Based on the above, there is evidence in the educational literature of the intensive use of technological tools that support teaching. Purcell, Heaps, Buchanan, Friedrich (2013) showed that when interviewing 2462 teachers, 92% stated that the Internet has a positive impact on the tasks assigned to their students; however, 87% also assured that contemporary technologies are creating a generation that is easily distracted, with very short attention spans.

On the other hand, Carr (2011) affirms that intensive use of the Internet and its information search applications may be having a negative impact on deep and creative thought processes, training people who are efficient in processing information, but less capable of deepening the analysis of that data. It should be noted that the generation of knowledge is broader and the large number of technological distractors in the environment makes teaching in the classroom difficult.

Uniting technological means with classroom teaching is the challenge of a more inclusive education. It is noted that in the business environment digital games are used to increase training, communication in collaboration with the staff of a company (Petridis, Hadjicosta, Shia Guang, Dunwell, Baines, Bigdeli, Bustinza & Uren, 2015, p. 55).

In relation to the above, learning trends in the business environment are consolidating gamification, simulation or serious games in the corporate culture, companies such as IBM, Cisco and Deloitte are investing resources in using games to train their strength of work, because staff do not find motivation in the current traditional forms of training, the use of game-based learning enhances the involvement of employees in the improvement of organizational management (Petridis, Hadjicosta, Shia Guang, Dunwell, Baines, Bigdeli, Bustinza & Uren, 2015, p. 59).

In educational science, there is a difference in the definitions of serious games, gamification and simulation. Serious games are a mental exercise where they interact with a computer according to specific rules using entertainment to communicate strategic objectives in various fields of knowledge (Zyda, 2005). The term

gamification is defined as the use of elements of game design in non-playful contexts (Deterding, Dixon, Khaled & Nacke, 2011).

A simulation is closer to a virtual reality where there are experiences at an emotional and cognitive level, the three definitions seek to involve the user's experience in generating playful experiences to add value through diverse motivations (Huotari & Hamari, 2012). For the purposes of this research, we will be calling the simulation designed as a serious game.

In the educational sector, the use of games by the teacher to promote learning in the student is still incipient. Although it is true, there are indications of the use of games in elementary schools to high schools, these involve a primary cognitive thinking based on identifying forms or colors. However, there is still a negative connotation related to the term game as a waste of time (McGonigal, 2011).

In addition, Morris, Croker, Zimmerman, Gill and Roming (2013) argue that video games have the potential to be used by educational sciences, the above involves strategies such as game-based learning that involve the interaction of work teams through rules, structure, and applied knowledge on businessrelated topics, which requires an effort on the part of the teacher to transform traditional schemes to innovative incentives to promote student learning.

3. Methods

The use of a serious game in educational science is important to clarify the objectives, rules, rights and responsibilities of the members of each team. The implementation of serious games in class is based on the programming of specialized software in which the teacher is involved to establish the content in knowledge.

The dynamics of game application are as follows:

Figure 1 Initial Game Prototype

Figure 2 Software Based-Starting Game

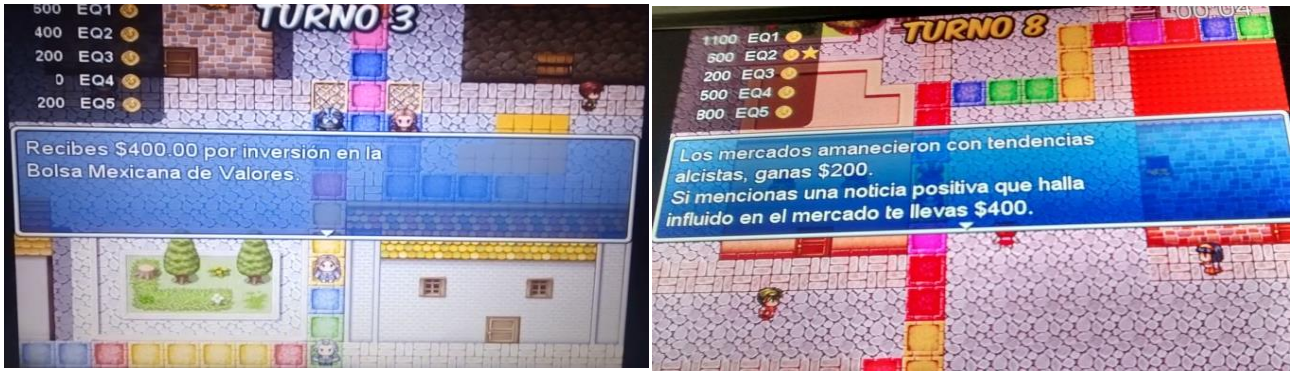

Figure 3 Sample Questions

In Figure 1, the development of an initial prototype of the game that would allow the interaction between the knowledge in class, group participation and motivation to self-study was started to advance within the serious game.

Figure 2 is the evolution of the prototype to the use of specialized programming to formalize serious play in the classroom.

Figure 3. Shows the way in which the questions are interrelated. If a team reaches a box, the corresponding question is released, depending on the answer, it can go forward or backward.

4. Results

In a first approach, students must study the topics taught in class. The teacher delivers a syllabus with content focused on management, business and finance issues. To validate the student's knowledge, the game is developed in a group dynamic that allows each student to be organized into a team of five people. Each team seeks to answer the questions according to the option in turn.

The question not answered correctly by a team can be answered by another team gaining points for their acquired knowledge. In contrast, the theoretical classes become dynamic classes where students get involved to answer the questions establishing competitive levels among them, motivating the improvement of participation in decision-making when answering. The implementation was carried out during the January–May 2019 semester once a week.

In the context of the application of serious play within the classroom, there are observations that highlight the importance of efficiency in classes, improving student performance and involving systemic knowledge, assertive decision-making and generation of self-study strategies.

To measure the progress of the use of serious games in the classroom, a preliminary test was developed for the students where teamwork activities, attendance, knowledge of the subject, group study and decision-making were evaluated.

The students who completed the test were 30, and were divided according to their studies, as follows: 5 finance, 1 marketing and 24 international trade.

5. Conclusions

To conclude this research, the following stands out:

The intensive use of applied technology within the classroom can motivate a paradigm shift by changing from a traditional teaching scheme to one that manages innovation in student learning.

The areas of creativity, logical thinking, decision making, collaboration, commitment, and application of knowledge within the classroom are strengthened, involving students to participate and encourage curiosity to learn.

The teacher tends to improve his teaching methods by means of technological tools, implementing new topics to show the similar relationship between classes and the business environment through simulation or recreation of reality.

There is potential in the use of serious games for education promoting skills, abilities, and self-esteem towards students.

Students have fun getting involved in serious games, which encourage their personal values towards the team, so that in a social, political or business reality with uncertainty, it will result in a management of solutions based on the intensive use of serious games.

Both the teaching on the part of the teacher and the learning on the part of the student become a fun experience.

References

Carr G. N. (2011). *The Shallows: What is the Internet Doing to Our Brains?* Editorial Taurus.

Drucker P. (1985). *Innovation and Entrepreneurship*, New York: Harper & Row.

Deterding S., Dixon D., Khaled R. and Nacke L. (2011). "From game design elements to gamefulness: Defining 'gamification'", in: *Academic MindTrek Conference: Envisioning Future Media Environments*, ACM, New York, NY, USA, available online at: https://www.researchgate.net/publication/230854710_From_Game_Design_Elements_to_Gamefulness_Defining_Gamification.

Huotari K. and Hamari J. (2012). "Defining gamification: A service marketing perspective", available online at: https://www.researchgate.net/publication/259841647_Defining_Gamification_-_A_Service_Marketing_Perspective.

Larrea J. L. (2006). *The Challenge of Innovation*, Barcelona: UOC.

McGonigal J. (2011). *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*, New York, NY: Penguin.

Morris, Croker, Zimmerman, Gill and Roming (2013). "Gaming science: The "gamification" of scientific thinking", *Frontiers in Psychology Review*.

Navarro Newball A. A. and Sánchez I. (2015). "Gamification in informal education environments: A case study", in: *Transforming Learning and IT Management through Gamification*, London: Springer.

Petridis P., Hadjicosta K., Shia Guang V., Dunwell I., Baines T., Bigdeli A, Bustinza O. F. and Uren V. (2015). "State of art in business games", *International Journal of Serious Games*, Vol. 2, pp. 55–60.

Purcell K., Heaps A., Buchanan J., and Friedrich L. (2013). "How teachers are usingtechnology at home and in their classrooms", accessed on February 28, available online at: https://www.pewresearch.org/internet/wpcontent/ uploads/sites/9/media/Files/Reports/2013/PIP_TeachersandTechnologywithmethodology_PDF.pdf.

Rubin L. F. (2007). The Classical World: An Epic of Greece and Rome. Planet Group.

Sánchez I. Peris F. J. (2015). "Gamification: Education in the knowledge society", available online at: http://gredos.usal.es/jspui/bitstream/10366/127205/3/S%C3%A1ncheziPeris_Gamificaci%C3%B3n.pdf.

Schumpeter J. A. (1963). *Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle* (3rd ed.), Mexico: Fund of Economic Culture.

Zyda M. (2015). "From visual simulation to virtual reality to games", *IEE Computer*, p. 2532, doi: http://dx.doi.org/10.1109/MC.2005.297.