DIGITAL GAME-BASED LEARNING: WHY, WHEN AND HOW

Pedro Neves Rito

Polytechnic Institute of Viseu (PORTUGAL)

Abstract

Studies on video games and teaching have been recurrent. Either in a perspective of being used as complementary elements in certain context of the program in a school curriculum or because they can help the teachers to encourage the students with some type of reasoning. Learning in the classroom using videogames can thus be enriched with the perspective of the design of a game by the students, on one or several themes that are approached in a school context.

Educators should be aware of the possibilities that currently exist in the use of videogames development engines where there is no need to program and that videogames are elements that most students recognize as valid to use in their learning.

The work that is presented here is a project that is related to the development of videogames in the classroom by the students. It is important to reflect on the course, what artifacts to use and how much. It is a work in development and here are presented some reflections that appear in the literature.

Keywords: Game-based Learning, videogames, educators, work in progress.

1 INTRODUCTION

Videogames have been around for more than sixty years. Learning through videogames is a topic that has been addressed by teachers and educators of which has been made various experiments at all educational levels, starting at the pre-school to higher education. However, this is a tool that not everyone knows how to use, for the vicissitudes of initial training, or even because private motivations about liking it or because of a strong motivation to not apply videogames in certain curricular activities.

For the videogame industry and developers, there is more and more a close relationship, even a union between entertainment and education. It is well known that there are great differences between listening, for example, to a history teacher, who narrates an episode according to his knowledge and plays a videogame on the same subject. The videogame allows the student to play the role of a historical character or a nation, making decisions and observing the consequences of their decisions in other characters or nations.

It is necessary to reflect upon the professionals who are coming out of the universities, and that will be the future teachers. There must be set up conditions for them (educators) to have these experiences of using videogames, perhaps incorporating in their curriculum activities with these tools.

With the evolution of technologies, support for playing videogames has also changed, and the digital format is increasingly accessible and multi-platform. When they emerged, videogames support tools were too basic and expensive but now with the resources of smartphones or tablets, we can have a group of students focused on developing activities on these platforms, through multimedia applications like videogames.

Moreover, nowadays the students are digital natives subjects who have a propensity to use any technology at any time.

Any learning that may be within the reach of education professionals will always depend on the strength of these professionals (educators) to change, factors related to the conditions that organizations provide for these activities and policies that are adopted to influence the use.

This is an ongoing work and is intended to present results of a literature review about the topic, showing the justifications that arise about the use of videogames in the classroom and how they can be a supporting tool to the teaching. It is also important to identify case reports and analyze how these tools can be used by those who are more resistance in the use.
2 THE VIDEOGAMES

All videogames express human values. They allow stories to be told, facilitate interaction between cultures, and potentiate the creation of myths, through the rituals of the players, the conventions that are established, the actions of the players or the music / sounds that emerge in these artifacts [1].

For some authors, videogames are not transmedia objects or just games [2]. Videogames "are an expressive medium that will continue to evolve over time as well as the habits of its players". The videogame is designed to provide an interactive experience for your players [3].

Technologies are part of the daily life of young people, and videogames are an artefact that is part of this universe of technology use. Young people consume part of their free time using technologies, computers and consoles [4]. Or we must be aware that videogames can also act as a gateway for young people to use technologies [5].

As videogames are rich in images, sounds and narratives (stories), they can be a way to "stimulate the fantasy and creativity" of young people [5].

On the other hand, in videogames we find objects that can have meanings. They may have meanings called denotative or connotative. In the denotative sense because videogames allow us to identify objects that have meanings that dominate our perception of the real world, because that is the way to use these objects, to use them to do our daily work, to survive, to be able to eat or to thrive. The connotative meaning may be those that are related to associations less clear to day to day tasks. For example. we use certain clothes in the day to day by the sensation of what these clothes can transmit in different situations and for different people [6].

Thus, videogames are a form of entertainment, information, culture, and the transmission of values and ideas [5].

3 GAME-BASED LEARNING THROUGH VIDEOGAMES

There are several authors who associate game-based learning with the ability of an individual to retain knowledge about a certain subject or theme and that is developed through the actions of playing a game [7].

We can identify two ways of using video games in the classroom: either acquire video games (commercial or otherwise) or place students develop the videogame.

The interest in this document is an initial reflection on the second aspect, using videogames in class, about a certain subject or theme, but that are developed by the students.

3.1 Why

According to the author Marques [4] the videogames beyond the question of being playful, allow the interaction between different variables, allow the development of selective attention, have educational potential and contribute to the cognitive development of youngsters and adolescents [5], because they imply a speed in the taking of "decisions, dexterity and coordination".

Videogames require players to play them in a strategic way, they also enable them to actively acquire knowledge, and boost the development of abilities to solve everyday problems [4]. There are also reports in the literature of situations where videogames allow stimulate fantasy and creativity in the players.

To the author Carita [8] the use of videogames by their players is because they consider videogames an artefact of fun, challenge, fantasy, socialization and learning.

Zea et al [9] refer that videogames are attractive to students, they improve cognitive abilities, that is time spent learning, motivation for learning, and their concentration and attention while playing / working with video games.

3.2 When

There have been several experiences of using videogames from the perspective of game-based learning. Most commercial videogames are used, that is, they are acquired.
In the research work carried out by Marques [10] he identified that the four genres of videogames that the respondents most enjoy playing are related to: first person shot (FPS); racing games (RC); action adventure (AA) e simulation games (SG). This identification of genres is also related to the identification of the main videogames that respondents play, whose list is ordered by preference: Counter Strike (FPS); Pro Evolution Soccer (SG); the Sims (SG); Fifa (SG); Killzone (FPS); Mahjong Quest; Super Mario Galaxy (AA); Call of Duty: World War (FPS); Street Fighter; Puzzle Arcade; Split/Second Velocity; Far Cry (FPS); and the Ghostbusters (AA). In this work it was also highlighted that 63% of respondents play on PC and preferably online.

3.3 How

It is the educators of today who have to create interesting experiences, since the pupils' brain structure can be modified through new learning. These educators have to make the right choices and realize that video games are part of everyday students' lives [11].

Before starting game design, it is necessary to define learning and teaching objectives in a given didactic situation, so that adequate digital resources can be planned and correspond to the objectives [12]. Whoever builds this planning has to pay attention to: the kind of knowledge students are expected to build; what type of learning situation students are confronted with; and what kind of learning the videogame will provide students.

There are currently on the market a series of tools that allow the development of videogames for the most diverse platforms. In parallel, there are also several repositories on the internet with resources that can be used in a freewheel.

These computer tools require little or no programming knowledge and provide a pleasant working environment for the construction of videogames. Some of the examples of these tools are: GameMaker; Unity; Unreal or the Blender Game Engine. There are others that could be applied in the first school years and used by students like Scratch or Alice.

4 CONCLUSIONS

To the author Mayer [7] Videogames are interactive artifacts, simulated systems that are rule based (they represent the system simulated or a model based on causal rules), responsive (the actions that are triggered have effects), challenging (the environments being simulated allow to be successful in activities recognized as difficult), cumulative (the environment reflects the decisions taken during the progress of the player until reaching the goal), and inviting (they are a pleasant experience for the players).

Videogames foster learning in a direct or indirect way. Direct because there are different levels of interaction, production and interpretive creations and that allow a multiplicity of solutions during their progression. Indirectly because most of these solutions are related to approaches that show values such as teamwork or mutual aid [8].

Also, and as the author Marques [10] refers: students who play videogames on a recurrent basis can increase the development of the level of extracurricular skills and may also play a determinant role in acquiring school success and new learning. From this research also was emphasized that the students who play show more attitudes of pleasure for discovery and greater capacity for reasoning and problem solving.

On the other hand, teachers and educators must adopt videogames in an educational context because they allow students to internalize content, attitudes and values [4]. There are no problems in the frequent use of videogames as these do not affect the students performance [13].

For Pereira [5] teachers have to be able to understand what motivates young people to play videogames and by that use these videogames as a reference for the development of certain activities, from a creative writing exercise to young people describing and sharing their experiences and what they learned from playing videogames with other students. It is not only educators who have to recognize the importance of videogames in classrooms, but also institutions and managers of those institutions must devise policies that allow such inclusion [14].

Students recognize that videogames are tools that teach them things related to culture, teaching learning and test learning [15].
ACKNOWLEDGEMENTS

This work is financed by national funds through FCT - Fundação para a Ciência e Tecnologia, I.P., under the project UID/Multi/04016/2016. Furthermore we would like to thank the Instituto Politécnico de Viseu and CI&DETS for their support.

REFERENCES