CONCEPTUAL DESIGN FOR VIDEO GAMES AS AN EDUCATIONAL TOOL

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ABSTRACT

This study aim to explore the use of video games in education their advantages and disadvantages. So what is a Video game? But a set of problems in a certain area that needs to be solved in order to advance, for example the game Civilization is a set of problems in history, Fallout 4 is set of problems in survival. All video games have a different set of problems that need solving in order to win or advance. Strategy games are the hardest kind of games, due to their complex design and nature with hundreds of variables and many outcomes. If a kid finishes these games on hard after thirty hours of game play, we do not give them a test to assess their understanding of the game because we trust this complex design of the game (Gee J. P., 2011). We have evolved to design and teach this complex games, so the next step of our evolution is to create a learning experience that immersive, deep, and rich with information.

Keywords: Education. Game-based, Video games

Introduction

Most teachers have a problem helping students to engage with learning and keep them motivated, rising the need to use a new technology in education (Cojocariu & Boghiana, 2014). Game-based learning has been found to promote a positive attitude towards learning and develop memory skills, along with its potential to connect learners and help them build self-constructed learning. The theory behind using video games in education is not new, but a traditional and well-tested approach to deep and effective learning, often instantiated in the best problem-based and project-based learning (Gee J. P., 2013). The study aims to illustrate the benefits of video games in education and the criteria of successful educational video games.

RELATED RESEARCHS

The issue of the using video game has been a very serious one during the recent five decades. The advancement of technology used in creating video games has opened a new area to investigation possible of teaching through video games, despite the often-justified prejudices of many adults. Games have become so important within the concept of that some authors call "Ludic epistemology" (Cojocariu & Boghiana, 2014), whose role is to analyze the theory of traditional knowledge and identify the way in which it may give life in education through games (Castell, 2011). Video games are an expression of the ludic nature of the human being. From entertainment and recreation to learning and behavior change (Connolly, Boyle, Hainey, & Boyle, 2012), games are necessary and useful. Learning playing video games may be intended or unintended.

The fundamental needs of learning meet the by Video games provide us with enjoyment, involvement, motivation, ego gratification, adrenaline, creativity, social interaction and emotion (Prensky, 2001).

According to how the video game is built and the final product, there are educational video

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games and didactic video games. Educational video games are solely designed for educational purposes or have secondary or incidentally educational values. They meant to teach people about certain subjects, reinforce knowledge, understand historical events or culture, or assist students in acquiring skills while playing; video games involve human interaction with a user interface generating a visual feedback on a video device (Keesee, 2012).

The didactic video game is specially produced for instructive educational, integrated and exploited inside in this aspect, under direct supervision and monitoring of the instructor. From the perspective of didactic video games, video game learning is defined as a type of game play which has defined learning outcomes.

A video game for learning is designed to balance the educational subject with game play, and the player's ability to comprehend and apply the knowledge to the real world. It is achieved from various perspectives: educational method, didactic procedure, and organization of the teaching-learning activity.

The transformation of the educational game into the didactic game was done in increasingly fast pace, to the extent where the modern theories on effective learning have shown that learning process is most effective when it is active, experiential, situated, problem-based and provides instant reply (Connolly et al., 2012). Games appeared to offer activities which have these features.

Educational video games may allow for multiple classifications (Connolly et al., 2012), these being closely followed by the systematization of didactic video games. In relation to the unprecedented progress of technology, we may draw the distinction between traditional learning games and digital learning games (Anderson, Anderson, & Taylor, 2009).

Traditional learning games have been developed for more than 30 years, starting with the 70s, revealing the trainers' concern for using them for a variety of tasks and the lessons objectives: to facilities the understanding of knowledge, concepts illustrating, skills building, retention and transfer, evaluating acquisitions but also maintaining the

students strongly involved, motivated and engaged in the task.

Digital learning games or learning video games are the extensions of connecting the teaching process to the new learning technologies. Prensky (2001) identified and analyzed a set of 12 features characteristic of video games:

1- Games are a form of enjoyment and pleasure.
2- Games are a form of play "intense and passionate involvement".
3- Games have rules and structure.
4- Games have goals or motivation.
5- Games are interactive.
6- Games are adaptive or flowing.
7- Games have outcomes and feedback (learning).
8- Games have win states (ego gratification).
9- Games have Conflict, competition, challenge or opposition.
10- Games have problem solving and creativity.
11- Games have interaction or social groups.
12- Games have representation and story emotion.

In an attempt to distinguish between traditional learning games and digital learning games or video games beyond the shared aspects, the mentioned author shows that, according to Erhel & Jamet (2013), "one of the medium's key characteristics is the "coming together" of serious learning and interactive entertainment. In other words, digital learning games can be regarded as an entertainment medium designed to bring about cognitive changes in its players".

The advantages of learning video games

Learning video games promote of positive attitude towards learning and developing memory skills, also it helps to connect learners and help them build self-constructed learning (Anderson et al. 2009, Whitton 2012); involving the entire students in a class in the active learning process (Anderson et al. 2009).

Learning video games form an efficient and effective tool to motivate students and engage them in active learning; besides active learning, learning video games also supports experiential learning, thus complying with the demands of the student-

centered approach to education; providing a transdisciplinary approach to education as students may work on multiple skills related to various aspects: researching, problem-solving, leadership, teamwork, creativity, logics, decisions making, adaptation, communication and interaction skills.

Other advantage of learning video games includes the player or learner, and expert in the activity, which enhances his self-esteem; the flexibility of digital games: the universe of the game responds to each of the player's actions; everything is possible in a video game; things are somewhat simpler compared to the real world; the video game working on a trial and error principle, the lack of risks; video games do not force children to learn but provide learning opportunities in every second, enhancing the learner motivation. Digital game-based learning involves the following four steps: being engaged in the activity; reflecting or looking back for discussing impartially; linking to ideas and experiences, seeing possibilities; judging or reviewing and deciding the next steps (Tam & Hui, 2011).

Video Games allow continuous monitor and control over progress through feedback. Players can develop cognitive, motor and spatial skills, and also improve their ICT skills. Video Games can be used to teach facts and principles of complex problem solving, creativity providing practical examples of concepts and rules that would be otherwise difficult to illustrate in the real world. Video Games also is useful in conducting experiments that could be hazardous or hard to implement in real life, such as the use of hazardous chemicals or astrophysics calculation (Simkova, 2014).

Disadvantages of learning video games

One of the disadvantages of learning video games are related to the time component involved - it is difficult for teachers to predict how much time students may need to accomplish all the levels of a game and to regard the educational game related task as completed, also establishing a deadline for the students to end the game may result in discouragement and low self-esteem for the students who would not be able to complete the task in the given amount of time; the different decisions taken by the students while playing the video game may lead to exposure to different learning material or content: this may result in difficulty for the teacher's to identify if and what the students have learnt, as well as possible flaws or gaps in the evaluation.

The other disadvantages of video games include excessive video games increases the risk of gradually eliminating interaction in the classroom; it may generate computer addiction and diminish social skills, interactional skills since all the information needed in the teaching or learning process are displayed on the screen (Keesee, 2012).

Game design

According to Garris, Ahlers and Driskell (2002) when studying games first you need to understand the model of learning. The goal when designing a game to incorporates certain characteristics and features which trigger a cycle that includes the user's reactions and judgments such as interest and additional system feedback. If the model is well-designed and implemented correctly, the instructional content will be paired with appropriate game features and this iterative cycle results in self-motivated and recurring game play. The result is an engaging game play that leads to accomplishing the specified learning outcomes and training objectives as depicted in the game based learning model from Garris et al., 2002 (figure 1). The main goal for game developers and designers is to create a process in which the users are engaged in repetitive play and return to the game over time. Research has revealed that learning can be more effective if the learner characterizes it as fun. In addition, to enhance and aide the learning outcome the educational assignment should be set in a motivating context. According to Cordova and Lepper (1996), a have a positive effect on the learner's motivation and learning the game should provide a meaningful context for the learner. For the learning process to be done effectively, the learner has to engage and actively interacts with the game. Garris et al. (2002) state that the goal is to get motivated learners, who are focused, enthusiastic and engaged. Another important factor is how specific clear and difficult the goals due to its influence motivation over active game play to enhance the performance (Locke & Latham, 1990).

The theme, characters and context that buildup the game will stimulate fantasy (Garris et al.,2002) are also important in order to achieve educational effectiveness. To motivate the user to devote more effort and thereby learn more we need to incorporate good feedback as an assessment of progress in the game interaction (Garris et al., 2002). Therefore, the design of educational game needs to be done very carefully by increasing the relevance and motivational force of the game for the learner to achieve effective learning goal.
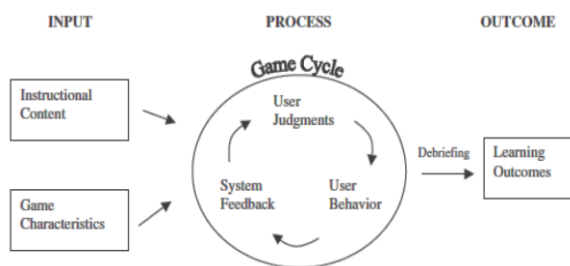
Game based learning model (Garris et al., 2002)

The educational content in the game can be a part of the game theme or it can emerge by interacting with the rules of the games. Since interaction adds realism and fun is crucial for learning, the content could also be considered for the story fiction dimension. That would open the opportunity for the use of multimodal representations in this dimension as well. The Interaction with the game rules forces the user to conduct a certain activity. Thus, the game rules can be educational content too and therefore, can also come from interacting with that specific knowledge. Technology is also one of the three dimensions of games design in terms of learning stated by Richard Rouse (2001), the game rules and the game story are bond by the technology used to represent them.
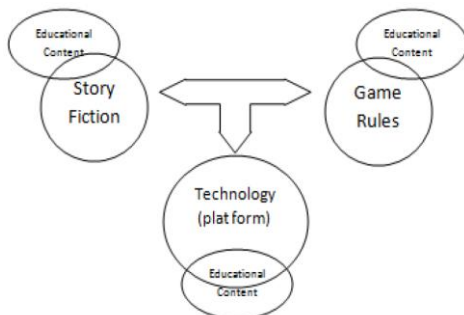

Game dimensions model (Richard Rouse, 2001)

Proposed Framework

In order to achieve the desired outcome of learning, this study focus on what the users' want in a game for learning or educational purposes and not only for entertainment reasons. Why a user will switch from the traditional learning methods, to game-based learning, we can answer this when we know what the requirements from users are for a game to be a called a learning tool. The three dimensions showed in figure 2 give an abstract idea about the games design, for educational content and learning. While considering several other factors of what users want, the dimensions can take a different paradigm. Rouse (2001) says several factors of "a never ending list" are out there, but when considering a design for games based learning, to achieve a better understanding of the user requirements for designing games for learning, some factors can be narrowed down and included into a framework. The proposed framework for developing games for learning is shown in figure 3.

This framework provide the developers or designers of games with a wide-ranging view, whether or not they are considering the important factors asked from the users' end, before and during the game development phases. The proposed framework can also be used as a verification tool to evaluate the success of any existing game as a learning tool.
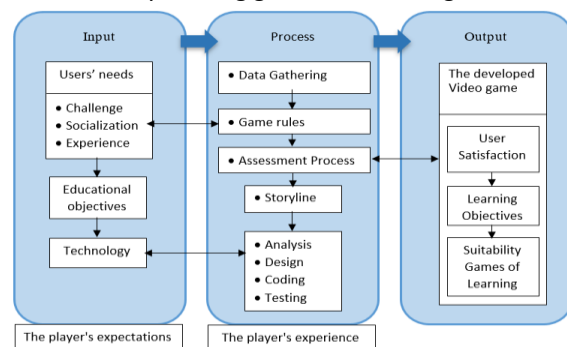
Proposed framework for developing games for learning

Conclusion

The proposed framework in illustrate the theoretical framework from Richard Rouse (2001) into a based model for designing games for learning. The parameters of the framework were not mentioned in previous game design dimensions, which gave an unclear understanding of what processes and procedures should be done to design

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a successful game for learning, or how to proceed in evaluating the successfulness of an existing game for learning.

To make the full use of a computer game as an educational tool, it is always important to remember to make sure that the users are active and motivated while playing the game. So, they can learn actively. Therefore, it is critical to consider their needs and expectations while designing the educational tool (games). This framework makes the foundation for successful design of games for learning.

This paper is theoretical work need to be further verified, but a similar study done by Mustaquim, M., Nyström, T. (2012) statistically verify the proposed framework in this paper.

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