

Concepts Of Serious Game In Education

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Abstract—using technology in Education is still very limited compare to other disciplines like medicine. In recent years ago researchers focus on serious game, because of the importance of game in learning and the enthusiasm of adults to play a game. Yet this process is in the research step. The model of a serious game shows its concepts, which is very important to match with the concepts of education. In this paper we try to suggest a model of serious game which includes most principles of an educational model. Then expose how a game can be used in education.

Keywords—serious game; educational model; adabted education

I. INTRODUCTION (HEADING 1)

Developing a game is a crucial issue, especially when there is a pedagogical objective in the background of the game or what we name “serious game”. Essentially there are questions left unclear, does a serious game is a video game basically designed for learning with a very little entertainment purpose? Or any game (physical or electronic) can be consider as a serious game? How can a game be used in education? What are the concepts of education to be taken in consideration in a game to be serious? What are the concepts of a game? What is the main difference between a general game and a serious game? Have an entertainment purpose in a serious game? If no, how can we attract users to play a serious games?

As defined by [1] a game and video games are contets played according to certain rules either with a computer in video games or without, and if there is a strategic objective to governorate it becomes a serious game.

But in general games have different characteristics other than fun and leisure. Because games are not just a way to communicate from distance but also have potential to foster children’s ability to learn how to communicate and interact with others [2]. If we look at serious games specially we can find a fundamental point. Because this kind of games are designed to entertain and educate players and to promote behavioural change via the incorporation of prosocial messages embedded within the game play [3].

Looking backward to the history, we can find that the notion of game comes from real life events. If we compare games with life “games consist of goals and rules. Players should comply with the rules in order to achieve the goals.” [4]. Even there are different opinion on the first occurrence of serious game, but upon [5] the term “serious game” for the first time was used in a digital context in 2002, with the initiative of starting the Serious Game lead by David Rejeski and Ben Sawyer in the US [5].

After this short presentation of serious game it must attempt to find a convenient answer of all above questions. For this purpose we have to look in detail at the process of

education apart and concepts of a serious game in another part. We think there is no game without an educational objective and there is no pedagogical method without entertainment. In next sections we will explain these two sentences and answer all above questions.

II. EDUCATIONAL PROCESS

Basically education is a process of learning a knowledge to a non-educated person. At first education has aim to control the behavior of learners, but in last century when the notion of education has been developed the process of learning also has been transformed to a new method of teaching concepts in a way that learners dependably is a center of the process and s/he takes the responsibility of teaching him/her self.

Today education is just to throw light on the way for learner to continue on it. Find the talent faculties of the learner to choose the common excellent way that is applicable for all learners.

The use of technology in education is new and still very limited. Especially the use of game in classroom is yet in the research step. There are many reasons, we can classify them into two categories; psychological and social. By psychological reasons we mean teaching method followed by institutions and teachers, curriculum selected for particular subject, and the learning objectives. And social reasons are the environment of learning, and the relation between actors of learning process.

Dewey [6] believed that the child's instincts and ability are very important in educating them. Although majority of child teach same subjects without asking them about their interest. May be because of the complexity of the educational process or because of lack of using technology in education. We can think about adaptive education by using new technologies and especially gamification. Actually this may be very difficult in real classes because curriculum developed for a physical class, but it is possible in near future in view of the fact that new technologies will affect deeply educational system.

Serious game will be a phenomenon in the coming years and the use of game in education will become a simple daily routine because of the simplicity and the expansion of using smart devices by children. Even if there is a limited use of this kind of game today because of social reasons. As most of parents want to prevent their child to spend his/her time by gaming. But, they will not have the same reaction for serious games if they are sure of its utility. With a serious game the player learn when s/he game. Also producers of serious game think about different design for their product to have a fun similar to general games. Because most of actual serious games are not very attractive.

III. SERIOUS GAME CONCEPTS

Serious game interested by researchers for using in learning basic concepts in different levels. Actually the use of this kind of game is not very popular, instead used in some fields like health care and business marketing. We think this may be because there is no solid model of such game that can be connected to the process of education. In this paper we define a model and we hope it will be the base for further research on this topic.

Once we defined the game and we give a short description of educational process, it is now time to explain concepts of serious game. We define six concepts of serious game which are used for educational purposes. These concepts are Scenario, Enthusiasm, Interactivity, User's traces, scoring and learning. In this section we explain each of them briefly.

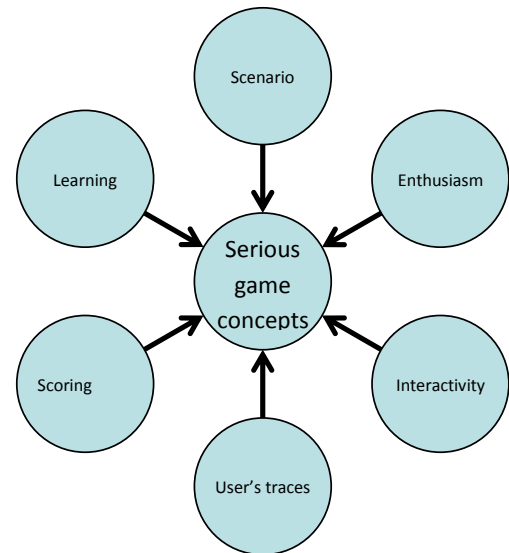


Fig. 1. Figure 1: Model of concepts of serious game

A. Scenario

The main purpose of serious games is to use game technologies for non entertainment purposes [7]. When we design a serious game we think about learning a concept by players. i.e., there is a curriculum to be taught through a scenario. This concept is much related to the study program in classical classrooms; learn a set of simple concepts in different levels through distinct techniques. The problems in serious games are well ordered [8] which facilitate writing scenarios.

May be we can say that there is a basic difference between scenario and curriculum. By scenario we mean a very short curriculum to give an idea about simple concept. And there may be no more curriculums related to it. But in classrooms there is a solid study program which is related to other programs in different levels. Even taught that, it is possible to have levels in a serious game related together.

B. Enthusiasm

We think about a game in educational process to make learners more enthusiastic in teaching. Today most of students does not like learning from classical method by using papers and pens. But the

Federation of American Scientists shows that kids spend about 50 minutes per day playing video games on average. Adult males, instead, spend 7.6 hours per week playing videogames and females spend 7.4 hours per week using different electronic devices [9]. If we can profit their challenge in the process of learning it will be a great step in the design of new educational system. We know the main aim of using serious games is not for entertainment, but it is very important to develop a very attractive game to engage players by using very popular game techniques to be played by most of teenagers. We must be careful about action games, because it may helps violence.

C. Interactivity

Interaction between player and game's user interface is a matter of many researches. To engage players with a game it is very important to have an interactive interface. In the same time it helps communication not just between user and the interface but also between users. Interaction between users helps improving different skills in addition to which players learn during the game. For example, practice another language, or learning new social aspect. This sometimes is the main objective of the game itself, as in games for learning language.

During the game, player thinks that s/he has an avatar in the simulation world and forms a goal that the player attributes to his or her surrogate in the world [10]. And then follow rules and regulations of that world to achieve it. This helps learning that regulation in addition to the notion in which the game has in its background.

Basically all games are interactive. But it must organize this feature in serious game to help learning not just to have a fun. Today it is so simpler to have such interface especially because of the wideness use of touch screens in new electronic devices.

D. User's traces

Education is a very hard responsibility. In learning process everything must be documented like student's exam copies, marks...etc. if we can also analysis some of these data for example, marks of students in one question in one subject in one stage, sure we will find an interested information that may be help the tutor and the educational institution to improve the quality of teaching such subject. This is very essay when we use serious game, because we have all user's traces in electronic format which can be analyzed quickly.

And if a tutor uses the game in the class, s/he can have a detail analyze of his/her class's traces instantly. And profit it in chining his/her strategy of learning.

One of strong point in success serious game is the ability to trace all players' actions. Scoring (next section) is one of the fundamental concepts of any game. Traces used for scoring players level as well as analyzing their actions. If we think about adaptive education, we have to analyze elements of player's in one level of the game to indicate him/her into the new step and giving adapted content. For example if we have a game to learn a language, if the player does not recognize letters, we cannot give him/her complex words. But if a player can write all letters and recognize some words, we can give him/her simple sentences.

E. Scoring

Make concurrence between different players and give different levels for same player may be is the key to attract users play a game. Scoring is to give points according to each correct action and deduct for all incorrect ones. As mentioned in previous section, user traces used in scoring and selecting next scenario's content. One of most popular techniques available today is the ability to publish player's score on social networks. This is very important because the concurrence becomes worldwide which encourage players to achieve highest level. And also helps in communicating [8] especially in serious games for learning languages, publishing player's level on the web will helps practice speaking or any other type of discussion like chatting. This is a borderless process to communicate and collaborate between players or playing in groups.

Therefore scoring in serious game is one of main concepts which can be taken into consideration to make a game very enthusiastic. There is no game without scoring, and there is no any educational system without grading. Publish scoring inside the same institution or school make challenges between students more important when s/he try to be first name in the list.

F. Learning

One of the very important concepts of serious game is learning. Even as we mentioned in the introduction, there is no game without educational objective. But the learning concept in a serious game is different in such a way that this game is developed for learning. While a simple game can

learn the player but basically it is not developed for learning.

These goals can be different for different users. For example, in business the learning objective can be to teach a new employee how to work in his/her new post. Or to teach employees of a company how to present new product to clients. But for educational institution, the objective can be how much learners were taught by the game.

Learning can be seen both as a result and as a process [8]. By interacting with digital games player's level will change because of interfering with different notions during the game. And all steps of the game have been putted sequentially so that the player will learn during the game process.

By definitions of serious game given in previous sections, serious game can help learning process in two ways. The first way is by improving player's skill in a specific topic during one step or level of a game and a set of topics in different levels. And the second way is to control the behavior of player in the simulation world by creating a virtual object that has to follow rules of that world and thus learn something by the consequence.

Nowadays serious games used for learning as outside school activity. We anticipate a big change in the near future in using serious games for learning as a school activity.

IV. CONCLUSION AND FUTURE WORKS

In this paper we presented concepts of serious game which can be used in education. We tried to find the answer of some crucial questions which have been left unclear or not answered yet. Our future objective is to develop this model to use it in the adaptive education. We think it is possible to talk about serious game as a tool for developing adaptive education. Because in the near future this last concept will be the phenomena in educational system.

This is a model we designed inside the project for developing a serious game "Jojo" for learning Kurdish language using Arami alphabets¹. Jojo will be the first serious game developed for learning Kurdish language. Our objective is to provide the first version in primary schools for learning adaptively Kurdish language by children.

Acknowledgment

This paper is prepared in the context of the project Jojo, a serious game for learning Kurdish language. This project is now in development and not testing on real students.

References

- [1] M. Zyada, Michael. From visual simulation to virtual reality to games. *IEEE Computer*, vol. 38, no 9. PP. 25-32, September 2005.
- [2] L. A. Annetta. The "T's" Have It: A framework for Serious Educational Game Design. *Review of General Psychology*, 105-112. 2010
- [3] K. E. Dill. (Ed.). *The Oxford Handbook of Media Psychology*. New York: Oxford University Press. 2013
- [4] Klearchos Douvantzis. *Serious Games – The Future of Learning*. <http://www.cs.yu.nl/~eliens/serious/local/essay/12/24.pdf>. 2012.
- [5] A. De Gloria, , F. Bellotti, and R. Berta. *Serious Games for education and training*. *International Journal of Serious Games*, vol. 1, no 1. 2014
- [6] O.P. Dhiman, *Foundations of education*. A.P.H. Publishing Corporation, New Delhi (2008)
- [7] B. Huynh-Kim-Bang, J. Wisdom, and J. M. Labat. *Design patterns in serious games: A blue print for combining fun and learning*. Project SE-SG, available at <http://seriousgames.lip6.fr/DesignPatterns>, 2010.
- [8] B. Holm Sørensen. *Concept of Educational Design for Serious Games. Research, Reflections and Innovations in Integrating ICT in Education*, 2009, pp. 278-282.
- [9] D. Derryberry. *Serious Games: online games for learning* San Jose, CA: I'm Serious.net. Adobe Systems Incorporated. September 2007. https://www.adobe.com/resources/elearning/pdfs/serious_games_wp.pdf
- [10] J. P. Gee, *Are Video Games Good for Learning? Digital competence*. *Nordic Journal of Digital Literacy*. (Universitetsforlaget, Oslo, 2007)

¹ <http://www.kurdishacademy.org/?q=node/37>

