APPLICATION OF SERIOUS EDUCATIONAL GAMES IN TRAINING IN BULGARIA

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Abstract

The paper presents concepts for serious educational games and their use in the educational process. The entry of serious games in Bulgaria is in its initial stages, but it has already begun. One preferred educational game suitable for testing the knowledge used in our country is Kahoot. The use of humanoid robots for training purposes is considered. Students' opinions on the use of serious games and virtual learning are presented.

Keywords: serious games, educational process, medical training, humanoid robots, virtual reality.

1. INTRODUCTION

In today's technological society, innovation enters all spheres of public life. Information, communication and 3D technologies are now entering classrooms and changing methods of educational process [22]. Today, everything is changing fast, changes happen every year, monthly and even daily. Not only relevant, but also necessary was e-learning in 2020 in a number of countries around the world. Serious educational games in their various forms are suitable for supplementing and diversifying training. An important element in e-learning is the active participation of learners. It is important for teachers today to hold the attention of their students and look for ways to increase the level of knowledge and success of students.

The use of serious educational games in education in primary schools, secondary schools and universities provides these opportunities.

2. CONCEPTS FOR SERIOUS TRAINING GAMES

The use of serious educational games (SEG) in education has begun to increase in the last few years. Teachers and lecturers saw in them a way to motivate their students and to test students knowledge through them. Through learning games, participants can learn, explore, compete with each other or act together to achieve a common goal [1, 2]. The original concept of serious game play (popular in the 1990s) was "education through entertainment" [3]. Zyda gives the following definition of a serious game: "Serious game: a mental contest, played with a computer in accordance with specific rules, that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives" [4].

As is clear from this definition, M. Zyda emphasizes some of the conceptual features of serious games:

- mental competition (not physical, for example) - this implies a preliminary process of accumulation of knowledge, which in the process of the game, the user to use and compete through them;
- existence of rules to be followed by the participants;
- entertainment that is combined with some serious goal;
- Serious games can be used in different areas of training: education, health, government training, corporate training, training for public policy purposes and so on.

An interesting concept for serious games, which includes computer terminology, is given by [5]: "interactive computer application, with or without significant hardware component, that has a challenging goal, is fun to play and engaging, incorporates some scoring mechanism, and supplies the user with skills, knowledge, or attitudes useful in reality." This concept updates the understanding of serious play by emphasizing several features:

- the purpose of the game, which contains a challenge and thus engages the attention of learners;
- contains a mandatory method for assessing consumer knowledge;
- contributes to the acquisition of new knowledge and skills;
- the educational purpose is integrated in the game character of the created software application.

Today, serious educational games are a homogeneous whole of an element of entertainment, through which the activity and interest of students is maintained; elements of acquiring new knowledge that are integrated into the game; opportunities provided to learners to control the learning process (opportunity to repeat, to comply with their own course of learning and time). In some educational areas, such as health and medicine, the use of serious educational games makes it possible to reduce training costs.

3. INTEGRATION OF SERIOUS EDUCATIONAL GAMES AND ROBOTS IN THE EDUCATIONAL PROCESS

Training systems using virtual reality and robots in training

Serious educational games can be integrated into the educational process and with the help of the use of appropriate robots, which are accepted with interest by learners, attract their attention and are a means to achieve higher educational results. Learner-robot interactions are not yet part of students' daily learning, but they are beginning to enter people's daily lives, helping them to perform certain activities and thus making their lives easier. The use of robots in the learning process will be part of the learning process, along with the use of serious educational games and classical learning.

Today, teachers are still wary of using robots in the learning process [6]. Younger students perceive them as their peers, older students have the attitude to use them as tools in solving certain tasks [7].

The inclusion of robots in the teaching of foreign languages is especially effective, when the learners can learn to pronounce words correctly, to guess the names of the subjects indicated to them, to lead dialogues in the studied language. Robots are very useful when working with students

with special needs [8, 9]. Multimodal interfaces are used, including speech, gestures and various input devices [10]. Robots can be used as a stimulus in the learning process in students with learning difficulties, causing them to activate brain compensatory mechanisms in an effort to improve student behavior and learning [8].

The main goal in the use of robots in students with special needs is to improve the abilities of learners through non-invasive educational methods. Here it is important to note the importance of the appearance of the robot, which must be well received by learners and thus its use to lead to positive, effective results. The robot-learner interaction is extremely important. This interaction must be skillfully supported by the teacher. The main task of the robot-learner interaction is to attract the learner's attention, to keep his attention, to encourage imitation, repetition of words and actions. The robot can take on the role of a teacher, which role is authoritative, and so it will not be perceived simply as an attractive toy, but will be able to fulfill its learning role. Learners are positively influenced by the fact that robots behave similarly to humans. Important factors that improve the learning process are social interaction, the possibility of eye contact, the presence of voice and movement [11,12,13].

Other factors that are essential in the use of robots in the learning process are emotions [14]. The ability to demonstrate emotions from robots has already been realized in some modern humanoid robots. The main common human emotions (happiness, anger, sadness, fear, disgust and surprise [15]) are programmed to be able to be expressed through the movements of the head, eyelids, hands of the robot. The humanoid robot NAO is a modern development that offers the opportunity to express emotion and this creates a more immediate environment between robot and learner. The movements of robots, based on the similarity of human gestures, lead to the possibility of robot-human interaction, which is close to human interaction. This improves both the communication of the trainees with the robot and the efficiency of the conducted training.

The use of robots in the education of children with special needs has a very important role, given the fact that it is extremely difficult to work with such students. It requires patience, perseverance, a positive emotional attitude. It is necessary to repeat elementary things many times, which is tiring for the teacher. Research shows that the use of robots can lead to better socialization of children with behavioral problems. Children can begin to treat the robot as their peer [16], which contributes to their engagement and develops their social skills.

4. THE USE OF SERIOUS EDUCATIONAL GAMES IN THE LEARNING PROCESS IN BULGARIA

Optimizing medical education using of video methods, virtual simulations, serious games and robots

The use of serious educational games, virtual simulations, and robots in the medical educational process in Bulgaria is still in its early stages. Our medical education already has traditions in the use of video methods - the video algorithms created by the University of Ruse "Angel Kanchev" are used successfully in many medical universities in Bulgaria. The transition to e-learning in March 2020 shows how long our education has come to meet global demands in this regard. This time, however, must will be walked, such are the modern realities. The experience of

e-learning has shown that students are better prepared and more adaptable to it than their teachers. This shows the need for training courses for teachers so that they can effectively teach their students in the next periods of e-learning.

Many teachers have managed to adapt and even started using serious games in the educational process. For example, the educational game Kahoot [17] is suitable and easy to use in school. Kahoot is a free educational platform that is used worldwide to create and conduct educational games [18]. It combines two things at once: in a short time it is easy to make a learning game and the game is fun and perceived with interest by students.

The game can be made in the form of a quiz by asking a question to which several answers are given, only one of which is correct. In this way, students' knowledge can be tested quickly and easily. It is possible to give the option to play the game several times, thus, in addition to testing, the game becomes an opportunity for training, to fill the gaps in training. Kahoot is especially useful in foreign language classes, but can also be used in medicine, health care, math, history, geography, and any other subject. The platform allows you to set a limit of thinking when choosing an answer and evaluate a given answer with a number of points. The correct answer is set in advance with a check mark.

Serious educational games, as well as robots, can be used to teach students with visual impairments. People with visual impairments, as well as other people with disabilities, need special treatment for them and their needs. These issues are the subject of various scientific studies [19, 21, 23, 24].

5. EXAMINATION OF THE CONSUMER OPINION

Studying effect of serious games and virtual reality in learning process of medical students in Bulgaria

The made survey (June 2019) shows the attitudes of medical students about virtual learning and the use of serious educational games in Bulgaria. The survey was conducted by Ruse University "Angel Kanchev" (the Faculties of Public Health and Health Care) [20], and the answers were given by those wishing to participate in the survey. The study involved 96 students and 47 teachers. According to respondents, the biggest advantage of virtual learning (including the use of educational games) is the ability for users to determine when and where to learn (62.90% of respondents give this answer).

A large percentage (50.30%) of respondents indicate the possibility of not being with their teacher at the same time and in the same place as an advantage. Disadvantages of the virtual training are the lack of direct contact with the teachers (67.80%), problems of technological nature in the implementation of the virtual training (44.10%). Only a small number of respondents (2.10%) believe that virtual learning is not suitable for them.

A high percentage of participants declare that they are willing to use virtual reality (the working in a virtual environment through serious learning games creating virtual reality) in their training (46.70%).

Study of impact of SEG on the motivation, success and future career development of students in the medical specialty

The study shows that students studying in medical specialties believe that serious educational games can increase their motivation to learn, improve the quality of their education and increase their academic success. Students report that the use of serious educational games, the creation of opportunities for acquiring skills and habits in virtual reality will contribute to their successful future career development in the field of medicine.

CONCLUSION

The paper addresses issues related to the concepts of serious educational games and the evolution of this concept over time. The modern understanding of serious game and the main characteristics of serious game are presented. The report points out the peculiarities of the integration of work in education, an issue that is already on the agenda in the educational process and is becoming increasingly relevant. The use of serious educational games and humanoid robots for educational purposes outlines an interesting trend in the development of education and reveals the prospects of a new type of education, for which to date students are better prepared than their teachers. The modern generation of learners is born ready to use new technologies, teachers of this generation must adapt to their way of learning.

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