USE OF VIRTUAL ENVIRONMENT AND 3D MULTIMEDIA ELECTRONIC TEXTBOOKS IN HIGHER EDUCATION

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Abstract
The purpose of this article is to provide an overview of the educational possibilities of the virtual world and metaverses in education, paying special attention to their pedagogical possibilities.

Keywords: communication technologies, virtual worlds, electronic textbooks, computer equipment,

At a time when our education system is constantly disconnected from reality, there is a growing need for students to experience rich experiences that lead to real academic achievement. The possibilities of the virtual world as a means of connecting students with the real world using communication technologies are multifaceted and are felt along with the real world in the learning process. Virtual worlds allow students not only to practice, but also to think creatively, study and conduct scientific research. At the same time, it also provides opportunities for many different learning styles through real-life learning opportunities. Virtual worlds are changing the way information is accessed and perceived, as well as the way information is transmitted and assimilated. While experience in the context of higher education explores in depth the potential of virtual worlds in education, there is a need to popularize experience that can serve as a key to future innovation in educational institutions.

3D environment is the natural environment for students . Most of the games they use in their spare time use this technology and are known as Massively Multiplayer Online Role Playing Games (MMORPG). These are video games in which a huge number of participants interact with each other in a virtual game world, and should not be confused with multiplayer virtual environments (muve), which are online multiplayer virtual environments, sometimes referred to as virtual worlds. Muve gives students the opportunity to participate in interactive learning at different stages. This allows students to "study together at the same time and in the same place" so that they can communicate with each other, exchange creative ideas and learn leadership for scientific research. They use 3D technologies such as software that allows users to have a unique learning experience, as well as immersive systems in large areas so that students can communicate with other participants synchronously and asynchronously [2]. In general, virtual worlds are also known as metaverses, a concept borrowed from science fiction. Virtual worlds - space modeling, three-dimensional representation of geographical objects and cities, as well as digital modeling of the real environment.

Second Life (SL) is a 3D environment that allows users to interact with images. Their main features are that they are easy to use, provide a range of collaborative objects, and have attractive 3D features . Overall, their new and highly immersive feel has turned virtual worlds into exciting scenarios for testing innovative educational technologies, and successful participants in the virtual world can deeply feel their presence in this world. The mirror world attempts to display (or reflect) the structures of the real world in 2 D or 3 D. GIS systems are often an example of Google Earth's 3D 2D mirror world SL helps students develop immediate and socially meaningful learning experiences and define their digital identity. The educational process is, in fact, a communicative process that takes place in a social environment. Therefore, Web version 2.0 tools , including SL , have such capabilities in terms of facilitating the learning process. Interactive learning requires social activities that evoke identities, awareness, relationships, connections, and interactions between learners [3].

Virtual worlds can be used to create very effective learning spaces. Since they are general and non-contextual, they can cover all disciplines. The social aspects of the virtual world are incredibly important for education. They are dedicated to creating role-playing games and scenarios that allow students to take charge without bringing up the temporary real world.

Metaversions and three-dimensional worlds in education: features and achievements

- providing a unique environment for learning and knowledge sharing;
- expand understanding of scientific and social experience;
-creation of great opportunities for group interaction and support activities, as well as providing meta-reflection to achieve educational results;
- improving cooperation and communication skills,
- allow students to easily transfer learning from the context of learning to the context of real life.
- encourage students to gain experience in practice;
- develop students' ability to create network and practical communities;
- develop problem solving and negotiation skills;
- help students to be purposeful, anticipate results and act to achieve them;
- formation of the ability to independently acquire knowledge;
-Supporting creativity, research and personal development through open learning methods;
- develop the ability and experience of understanding others;
- offering unique opportunities for self-expression [1].

Simulations and virtual worlds involve students in a higher level of cognitive thinking, such as interpreting, analysing, discovering, evaluating and, above all, problem solving by conducting their own experiments using 3D virtual worlds .

Education provides for the implementation of the following tasks to create a 3D virtual environment and multimedia electronic textbooks:

Pedagogical and psychological requirements for the structure and content of 3D multimedia electronic textbooks, such as an ergonomic description, the implementation of educational material of varying degrees of complexity, the possession of a high degree of clarity, reflection of a set of variable tasks, clarification of aspects of interactivity and optimality of learning based on direct consideration of the fact that it will have didactogenic productivity;

Such principles of creating and developing software for a 3D multimedia electronic textbook on the discipline "computer software" based on the Unity program , such as modularity, completeness, visibility, branching, manageability, flexibility, determine the identity with the algorithm for constructing a technological scenario for a course that requires computer implementation of information interactions of the subject-object type in the learning process. clarification by fixed markup;

Improving the creation of a 3D multimedia electronic textbook on the discipline “computer software” based on the Unity program by developing a mechanism for continuous correction of the multimedia component in the processes of collecting resources, optimizing quality, determining the structure, designing hypertext, forming an intelligent core, structuring the learning system, designing visualization stages;

Qualitative criteria for evaluating the effectiveness of using a 3D multimedia electronic textbook are compliance with educational standards, possession of the ability to fully assimilate educational material, improving indicators of consistency with the forms of organizing educational activities and diagnosing educational results based on the maximum consideration of the adequacy of the level of access to repeated feedback.

Based on these tasks, the following practical results are expected to be achieved:

The structure, content, pedagogical requirements for the creation of 3D multimedia electronic textbooks, evaluation criteria are improved within the framework of professional competencies that need to be formed among students;

for higher educational institutions, based on the subject “computer software”, a multimedia electronic textbook is created using the Unity program;

modules of the structure of a 3D multimedia electronic textbook on the discipline “computer software” in higher educational institutions are improved with the help of a motivational algorithm;

Efficiency of use is determined on the basis of consistency, continuity and succession of information and innovations presented in the 3D multimedia electronic textbook.

For training to be as effective as possible, it is necessary to implement:

- ensuring that the learning objectives of the Metaverse, 3D virtual worlds and assessment are consistent;
- providing an opportunity to reason through dialogue and discussion;

- placing aspects of learning and control in an immersive environment to test knowledge so that students can study on their own;
- development of realistic scenarios to move from exercises to real life;
- align assessment with learning activities so that it is effective.
- the introduction of a feedback system in educational activities so that learning is effective.

The results of the analysis showed that the electronic 3D multimedia textbook occupies a special place among the new pedagogical technologies, fundamentally different from the traditional (ordinary) textbook in the following features:

* the provider of methodological assistance closest to the teacher;
* theoretical and practical information related to each chapter, subject of science, organization of laboratory classes based on a virtual creature, the availability of demonstration opportunities using voice visual aids;
* manifestation of various information in motion;
* the presence of practical application in science;
* the presence of subject test questions, tasks, entertaining games
* data compactness;
* the ability to provide a lot of information in a short period of time;
* students who feel like they are in a virtual being;
* high efficiency of assimilation by students, etc.k.

In short, the Metaverse, 3D multimedia e-textbooks and virtual worlds are increasingly being used in education. In particular, the creation of immersive, authentic and multimedia learning provides an opportunity to structure distance learning in interesting ways and is rapidly becoming a key part of the entire learning space. Despite the growing interest of practitioners and researchers in the opportunities for learning and knowledge sharing in these unique learning environments, current virtual world technologies provide a number of opportunities that need to be developed further. Higher education institutions need to see the potential of these technologies and integrate them into their daily teaching and learning practices.

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