

THE PROSPECTS OF AUGMENTED REALITY APPLICATION IN EDUCATION

Vinnitsia National Technical University

Анотація

У статті розглянуто перспективні напрямки застосування доповненої реальності в навчальному процесі вищих навчальних закладів. Запропоновано різні підходи використання доповненої реальності в освітніх, наукових та практичних цілях.

Ключові слова: доповнена реальність, середовище реального світу, сприйняття, візуалізація.

Abstract

The article considers the promising directions of augmented reality application in educational process of higher institutions. Different approaches of augmented reality use for educational, scientific and practical purposes are suggested.

Keywords: augmented reality, real-world environment, perception, visualize.

Introduction

The first commercial augmented reality experiences were used largely in the entertainment and gaming businesses, but now other industries are also getting interested about AR's possibilities for example in knowledge sharing, educating, managing the information flood and organizing distant meetings. Augmented reality is also transforming the world of education, where content may be accessed by scanning or viewing an image with a mobile device or by bringing immersive, markerless AR experiences to the classroom [1].

Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real-world are "augmented" by computer-generated perceptual information, sometimes across multiple sensory modalities including visual, auditory and somatosensory ones. The overlaid sensory information can be constructive (i.e. additive to the natural environment) or destructive (i.e. masking of the natural environment) and is connected with the physical world such that it is perceived as an immersive aspect of the real environment. In this way, augmented reality alters person's ongoing perception of a real-world environment, whereas virtual reality completely replaces the user's real-world environment with a simulated one. The primary value of augmented reality is that it brings components of the digital world into a person's perception of the real world. It is achieved not only by displaying of data, but through the integration of immersive sensations that are perceived as natural parts of the environment. The potential of augmented reality application in educational process is promising [1].

Augmented reality in education will soon affect the conventional learning process. AR has the potential to change the location and timing of studying, to introduce new and additional ways and methods. Capabilities of Augmented Reality technology may make classes more engaging and information more apprehendable.

Nowadays 80% of young people own smartphones. Most of them are active smartphone users that use these gadgets to access social platforms, play games and to be in connection with friends and relatives. In the meantime, much lesser part of the learners uses phones for studying purposes, for doing homework, for searching information in the Internet [2].

The potential of combining smartphones and augmented reality for education is therefore big, though it still has to be fully discovered. AR, in various ways, could grant students extra digital information about any subject, and make complex information easier to understand.

Ability to connect reality and digital content has been steadily improving, opening more options for teachers and students. Nowadays there are introduced some excellent examples of augmented reality application in European and Canadian higher education institutions. These approaches include:

1. The use of augmented reality in the classroom

Augmented reality animated content in classroom lessons could catch students' attention and motivate them to study. Adding extra data, e.g. a short biography of a person, interesting facts, historical data about sites or events, visual 3D models would give students a wider understanding of topics.

While doing homework, students may scan certain elements of a book and receive text, audio or video tips from teachers, find useful information about the course, which could lead to better communication [2].

2. Explaining abstract and difficult concepts

AR technology has an ability to render objects that are hard to imagine and turn them into 3D models, thus making it easier to grasp the abstract and difficult content. This is especially good for visual learners and practically anyone to translate theoretical material into a real concept. For example, Polytechnic Institute of Leiria in Portugal integrates AR into math lessons and students report it as helpful, easy and interesting.

3. Engagement and interaction

By incorporating Augmented Reality into lessons teachers are able to involve students into the process with 3-dimensional models. It may be just a part of the lesson, like a teaser, or the support of the main topic with extra info from a different perspective. For example, Canadian tech company CASE transformed the wall of the school gym into a ball game by adding Augmented Reality layer to it. The students threw balls onto a wall to hit floating shapes and thus had exciting physical exercises [2].

4. Discovering and learning new ideas

Visitors of museums could access AR via smartphones and discover historical content related to objects, get additional information about the exhibits. Yet due to space or budget limitations not all museums and landmarks can afford this application of technology. Once AR becomes more available, there will be new great opportunities for museums. The main advantage nowadays is that Augmented reality is already accessible to visitors through mobile devices.

5. Training for practical and professional purposes

In many cases, theoretical knowledge is not enough to obtain proper skills in professional areas. The learners shouldn't be mere listeners and passive observers. The students of technical faculties especially need practice and hands-on experience in their areas. Through interaction, unlike virtual reality, AR features could help perform a virtual practice – with augmented tutorials, digital modeling and simulations, and finally acquire some experience in science and engineering. It is believed that motivated and engaged students will understand a subject better and learn faster [2].

Conclusion

Despite the rising use of Augmented Reality in many areas of the modern era, augmented reality in education is still new and unsettled. Taking into consideration possibilities of AR in teaching and studying are great, this application provides new ways of learning. The teachers have the opportunity to catch the attention of students and motivate them better, while students get new tools to visualize their subjects and complex concepts, as well as obtain practical skills.

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Рудницька Тетяна Григорівна – старший викладач кафедри іноземних мов, Вінницький національний технічний університет, e-mail: rudnytska@vntu.edu.ua

Арсенюк Дмитро Володимирович – студент групи УБ-15(б) факультету Менеджменту та Інформаційної Безпеки Вінницького національного технічного університету, м. Вінниця, e-mail: dima23790@gmail.com

Rudnytska Tetiana Hryhorivna – an assistant professor of Foreign Languages Department, Vinnytsia National Technical University, e-mail: rudnytska@vntu.edu.ua

Arseniuk Dmytro Volodymyrovych – a student of Management and Information Security Faculty of Vinnytsia National Technical University, e-mail: dima23790@gmail.com