ORGANIZING PRACTICAL LEARNING PROCESSES USING VIRTUAL REALITY TECHNOLOGIES

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Annotation: This article explores the effective organization of practical learning processes using virtual reality (VR) technologies. It analyzes the possibilities of VR technologies in education and their role in developing students' knowledge and skills. Additionally, the advantages of organizing practical lessons in a virtual environment and the integration potential of this technology into the educational process are highlighted.

Keywords: Virtual reality, educational technologies, practical training, interactive learning, innovative pedagogy.

Introduction

The application of innovative technologies in modern educational processes is of great importance. In particular, virtual reality technologies enable students to learn in environments that closely resemble real-world conditions. Traditional teaching methods are mostly based on theory, whereas VR technologies allow for the organization of practical lessons in an interactive and engaging manner. This contributes to the improvement of students' comprehension levels. The use of VR technologies is especially significant in fields such as medicine, engineering, architecture, aviation, and the military, where practical training is crucial. It provides students with a safe environment to simulate real-world processes, allowing them to learn from mistakes and gain experience. Therefore, this article examines the impact of VR technologies on education, their advantages, and methods of application.

1.   The Role of Virtual Reality in Education

Today, virtual reality refers to three-dimensional computer simulations that create the illusion of physical presence without actual physical components. One of the applications of augmented reality (AR) is the use of so-called "augmented reality glasses." For example, Microsoft HoloLens can create holographic objects in a living room. More manufacturers are bringing technologically advanced augmented reality devices to the market, such as Google Glass or Sony Smart Glasses. These glasses completely cover the eyes—reality is no longer visually perceived, leaving only the virtual world. In a computer-generated three-dimensional environment, users can interact with the surroundings. Often, a smartphone acts as the computing device (in which case the phone is simply inserted into the glasses). Sensors in the glasses track user movements: if a person turns their head, the virtual reality image updates accordingly. In real time, virtual reality adapts to user actions, creating a 360-degree view.

New technologies frequently integrate into various aspects of our lives, and the same is happening with virtual and augmented reality. Currently, VR technology is being adopted in many fields, including:

- Assisting in the design of complex mechanisms (oil and gas industry, construction, technological facilities, etc.)
- "Remote control"—repairing complex equipment (aviation, automotive, communications, construction, etc.)
- "AR-laboratory"—virtual operating rooms, rehabilitation centers, simulations of physical and chemical processes, experimental research, and development
- Marketing and advertising—explaining complex concepts in a simple visual language, emotional marketing, mobile applications, virtual fitting rooms, exhibition marketing, large-scale innovative presentations, new engagement methods, and interactive catalogs

However, VR technology is now actively applied in education. In learning environments, VR offers multiple stimuli and the ability to broadcast various types of embodied materials. It enables the modeling of complex visual-spatial-auditory environments, allowing interactions with virtual objects.

VR influences education in the following ways:

- **Practical learning** – Students can directly test complex processes in their respective fields.
- **Experience-based learning** – Theoretical knowledge alone may not be engaging, but VR provides real-life experiences.
- **Personalized learning** – Each student can progress at their own pace in a virtual environment.
- **Expansion of distance learning opportunities** – VR allows students to participate in the learning process from anywhere in the world.

2. Organizing Practical Training with Virtual Reality

VR technologies make it possible to organize realistic and interactive practical training in various fields:

- **Medicine:** Students can enhance their skills by simulating surgical operations, gaining experience in patient interactions.
- **Engineering:** VR helps understand the functionality of complex technical structures and mechanisms.
- **Aviation:** Pilots train in virtual environments that closely resemble real-world conditions, preparing for emergency situations.
- **Architecture and Design:** VR facilitates working on building projects, interior design, and other creative fields, allowing designers to assess their work and identify flaws in advance.

Through such interactive training, students not only strengthen their professional skills but also prepare for real-world challenges by testing solutions beforehand.

3. Advantages and Challenges of Using Virtual Reality
Advantages:

- **Improved educational effectiveness:** VR increases student engagement and enhances knowledge retention.

- **Safety:** Practical training occurs in a risk-free environment. For example, medical students can use VR simulators to practice complex surgeries without real-life risks.
- **Interactivity and visualization:** Students gain a close-to-real-life experience by observing and interacting with processes firsthand.
- **Opportunities for distance learning:** VR enables students from different parts of the world to participate in educational programs.

Challenges:

- **High costs:** Implementing VR technology requires significant investment.
- **Technical requirements:** High-quality VR devices need strong computing resources and stable internet connections.
- **Adaptation of educators:** Teachers must acquire new skills to integrate VR into the education system effectively.
- **Health concerns:** Prolonged exposure to VR may cause dizziness, eye strain, and other physical discomforts.

Conclusion

Virtual reality technologies are becoming an integral part of modern education, offering significant opportunities for effective practical training. With VR, students not only reinforce theoretical knowledge but also gain real-life experience. In the future, further advancements and broader implementation of VR in education will enhance learning quality. However, optimizing the costs and technical feasibility of VR technologies remains a crucial task.

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