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IMMERSIVE TECHNOLOGIES IN HIGHER EDUCATION INSTITUTIONS FOR DESIGNERS

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Annotation. The paper investigates the introduction of immersive technologies, in particular virtual reality (VR), into the design and training process of designers. The key advantages of VR are considered, including improved spatial perception, effective interaction between designer and client, increased design accuracy, and the ability to make changes in real time. Particular attention is paid to the role of VR in creating an interactive environment that allows clients to immerse themselves in future projects, providing feedback and optimizing the decision-making process. The paper also focuses on the integration of VR into the educational process for designers, which contributes to the development of professional competencies and improves educational experience. The prospects of using other immersive technologies, such as augmented reality (AR) and mixed reality (MR), for the further evolution of design practice are noted. The conclusions of the paper emphasize the significant potential of VR in improving design efficiency, reducing communication barriers between project participants, and introducing innovative approaches to visualization and learning.

Keywords: *immersive technologies, virtual reality (VR), augmented reality (AR), mixed reality (MR), design, spatial perception, interactive interaction, educational process, modeling, visualization, iterative process, professional competencies, design innovation.*

Problem statement. Immersive technologies, including virtual and augmented reality, are innovative tools that are gradually gaining popularity in the educational process. In higher education institutions, particularly in the field of design, these technologies have the potential to change the approach to learning, providing students with new opportunities for hands-on learning and the development of creative skills. However, the introduction of these technologies into the educational process raises a few problems, including technical difficulties, the need to adapt curricula, teacher training, and high financial costs. There is a need to study the effectiveness of using **immersive technologies** in higher education institutions to train future designers, as well as to determine the best ways to integrate these tools into the educational process.

The purpose: to investigate the possibilities of introducing immersive technologies, in particular **virtual reality (VR)**, into the design and training of designers, as well as to determine their impact on increasing design efficiency, improving the interaction between the client and the designer, developing professional competencies, and optimizing the educational process.

Theoretical part. The modern development of digital technologies is changing approaches to education and training, and one of the most promising innovations is the introduction of immersive technologies. These are technologies that create the effect of immersion in a virtual or augmented environment, including **virtual reality (VR), augmented reality (AR), and mixed reality (MR)**. For designers in various specializations, such as graphic design, interior design, fashion design, and media design, these technologies are becoming not only relevant but also essential tools in their training and professional development.

Immersive technologies allow you to create and simulate real-world situations, experiment with shapes, colors, materials, and other design elements, which allows you to develop critical skills such as interactive thinking, prototyping, and creative problem solving. They allow students to immerse themselves in future professional scenarios, practically honing their skills while still in school. Students can work in a safe and creative environment. This stimulates their professional development and prepares them for the challenges of today's marketplace. Higher education institutions that train design professionals can use these technologies to develop new competencies, adapting students to the conditions of the digital age. The integration of immersive technologies into the educational process will be an important step in training a new generation of designers who will be able to effectively use modern tools to create innovative and competitive solutions. This will improve the quality of education and expand opportunities for the development of students' creative and professional skills.

Immersive technologies are technologies that provide full or partial immersion of the user in a virtual world or a combined environment that combines real and virtual reality. Such technologies are often referred to as augmented reality, which includes **virtual reality (VR), augmented reality (AR), mixed reality (MR), and 360° content**. They create the effect of being present in alternative spaces, changing the perception of reality and user experience in various areas of life.

- **RR (Real Reality)** is a real or objective reality that a person perceives with the help of the senses.

- **VR (Virtual Reality)** - virtual reality, which is a fully modeled environment using modern technologies. It includes not only three-dimensional images or 360° scenes, but also sound, tactile sensations, and even smells, making the experience as realistic as possible.

- **AR (Augmented Reality)** is an augmented reality in which elements of the virtual environment are added to the **real world (RR)**. An example is mobile applications with graphic objects overlaid on the physical environment.

- **MR (Mixed Reality)** is a mixed reality that combines the capabilities of VR and AR. It is an integrated environment where virtual objects are not only superimposed on the real world but also interact with it. Devices like Microsoft HoloLens are an example of MR technologies.

- **XR (Extended Reality)** is an umbrella term for VR, AR, and MR technologies.

- **360° photos and videos** are content created by stitching together several images or videos to provide a 360-degree panoramic view. There are also 360° broadcasts that allow users to immerse themselves in real-time events.

Immersive technologies have their own unique features and differences that determine their effectiveness in various applications. Scientists note that augmented reality (AR) is more accessible and promising than virtual reality (VR). AR allows focusing on key aspects without being distracted by secondary elements of a fully virtual environment. This not only broadens students' horizons, but also increases their interest in the learning process, stimulating the active acquisition of new knowledge and the formation of the necessary competencies. On the other hand, virtual reality is more effective in areas that require full immersion, such as video games or simulations for developing professional skills in specialized fields. VR provides a deeper modeling of environments and situations, which is especially useful for training in conditions that are difficult or impossible to reproduce in real life. Thus, both augmented and virtual reality have their advantages: AR facilitates the integration of new knowledge into a real environment, while VR creates the most realistic training and learning environment for certain professional areas.

The main advantages of immersive technologies:

1. **Visibility** - the ability to visualize objects and phenomena that are difficult or impossible to see in the real world.
2. **Concentration** - minimizing distractions in the learning process by immersing yourself in a virtual environment.
3. **Involvement** - the ability to integrate gamification elements, which makes the learning process more interactive and engaging.
4. **Safety** - training in a virtual environment reduces the risk of damage to equipment or facilities to zero.
5. **Efficiency** - technology improves the quality and speed of knowledge acquisition.

Advantages of augmented reality (AR):

1. **Increased engagement and motivation** - AR helps to keep students' attention and supports their active participation in the learning process. By creating an immersive and interactive experience, technology stimulates interest in learning and exploring new information.
2. **Improved understanding and retention of attention** - AR allows you to visualize complex concepts, making them easy to understand. Historical events, scientific processes, or abstract concepts come to life, making them easier to learn.

To maximize the effectiveness of AR in the educational process, teachers should carefully select tools and integrate them into teaching strategies. Proper implementation of this technology creates an innovative educational environment that motivates students to actively explore the world.

Immersive technologies significantly improve the learning process, increasing the speed and quality of learning. Thanks to interactive visual environments, students retain information better because they actively engage the visual, auditory, and kinetic channels of perception. Research shows that people memorize:

- 20% of what they see,
- 40% of what they see and hear,
- 70% of what they see, hear, and do.

Immersive technologies allow you to create virtual spaces where information is dynamically updated, providing access to unlimited learning materials. They also contribute to the formation of a holistic information culture and can be used for inclusive learning, considering the needs of students with disabilities.

The introduction of immersive technologies in design opens new opportunities for creativity, design, and presentation. Thanks to virtual reality (VR), augmented reality (AR), and mixed reality (MR), designers can realize ideas that are impossible or difficult to implement in a physical space, making it easier to work on complex concepts. Below are **examples and case studies** of immersive technologies in various design areas.

1. Architectural design and visualization

Case study: Virtual tours of architectural projects.

- Architects and designers create virtual models of buildings where customers can "walk through" the facility before construction begins. VR technologies provide deep immersion and a realistic perception of space.

Example: Autodesk Revit + VR - the platform allows you to create interactive 3D models that can be viewed through VR glasses, such as Oculus Rift or HTC Vive.

2. Interior design.

Case study: Visualization of interiors in augmented reality.

- Designers use AR to create interiors where customers can see how furniture, decor, or wall color will look in their space.

Example: IKEA Place is an AR-based app that allows you to place virtual furniture in a real room using your smartphone camera.

3. Product design.

Case study: Prototype testing in VR.

- With the help of VR technologies, designers create digital models of products, which allow them to test their functionality, ergonomics, and aesthetics before they are physically manufactured.

Example: Ford and Gravity Sketch - Ford uses VR tools to create automotive prototypes, which significantly reduces development time and cost.

4. Graphic and media design.

Case study: Visualization of projects in VR and AR.

- With AR applications, graphic designers can bring posters, books, or promotional materials to life by adding animation or interactive content.

Example: Adobe Aero is a tool for creating augmented reality, where static objects become interactive.

5. Design of environments in video games and media projects.

Case study: Creating immersive game worlds.

- Designers use VR to create fully interactive virtual environments for video games or media projects.

Example: Unreal Engine is a popular tool for developing games and VR environments that is used in both game development and architectural visualization.

6. Fashion and fashion design.

Case study: Virtual fashion shows.

- VR and AR allow you to showcase clothing collections in virtual environments or create a virtual fitting.

Example: Vogue and Balenciaga - brands hold virtual fashion shows where viewers can view collections in 360°.

7. UX/UI design.

Case study: User experience testing in VR.

- UX designers use VR to test interfaces in three-dimensional space, especially for AR and VR-related applications.

Example: Invision VR is a tool for creating interactive VR prototypes that allows you to test user interfaces in practice.

8. Educational design.

Case study: Immersive learning environment.

- Designers develop educational VR scenarios and AR interactives to teach complex topics.

Example: Google Expeditions is a platform for creating virtual tours used in educational institutions.

The introduction of immersive technologies in design allows not only to optimize work processes but also to create a unique experience for customers and users. The use of VR, AR, and MR makes it possible to visualize ideas, test them at early stages, involve consumers in the development process, and make the final product more functional and attractive.

Conclusions. The integration of virtual reality (VR) into design practice indicates a change in approaches to the design process and the interaction between designer and client. The results of the study show that the use of VR allows:

1. **Improve spatial perception** – clients and designers have the opportunity to understand an object or space more deeply through interactive visualization.

2. **Increase the effectiveness of interaction** – VR creates an environment where the client can directly «walk» through the future project, which facilitates discussion, clarification of details, and decision-making.

3. **Ensure design accuracy** – the technology allows you to make changes in real time and quickly test alternatives.

Implementing VR in design practice involves the following steps:

- **Standardization of VR tools:** design firms should choose software [3] that integrates with existing design tools and is accessible to clients.

- **User training:** to use VR environments effectively, it is necessary to conduct training sessions for both designers and clients.

- **Iterative approach:** Using VR for real-time modifications supports an iterative process where multiple concepts can be tested, ensuring optimal decision-making.

Prospects also include the integration of augmented reality (AR) and mixed reality (MR), which will allow for even more interactive and multifaceted visualizations. Accordingly, the use of VR not only solves the problems of traditional visualization, but also contributes to the development of new design methods that can significantly improve collaboration between designers and clients, ensuring high quality of the final product. In the educational process for designers, VR provides new opportunities for

developing practical skills in a virtual environment, preparing students for real market requirements. This helps to improve the quality of training of specialists who will be able to work effectively with innovative technologies in the future, changing approaches to design and collaboration in the field of design.

References:

1. Johnson, Alice, and Doe, Emily. (2020). "Exploring the Impact of Virtual Reality on Modern Interior Design Practices." *Journal of Innovative Design Technology*, 5(2), pp. 134-145.
2. Davis, Robert. (2019). "Immersive Environments: The Use of Virtual Reality in Client-Designer Collaboration." In *Proceedings of the International Conference on Digital Design and Manufacturing*, Berlin, Germany, March 22-25, pp. 202-210.
3. Lauren Eutsler and Christopher S. Long. (2021). "Preservice teachers' acceptance of virtual reality to plan science instruction." Published By: International Forum of Educational Technology & Society, National Taiwan Normal University, Taiwan. Vol. 24, No. 2 (April 2021), pp. 28-43. URL: <https://www.jstor.org/stable/27004929>
4. Magnus Penker, Gerry Purcell, Jack Roberts (preface), Christer Fuglesang (foreword). (2024). "Innovation by Design: Innovation Management Systems for Global Impact (The Complete Guide to Business Innovation)." Large Print, 287 p.