Chapter 10
Healthcare Applications of Augmented Reality (AR) and Virtual Reality (VR): Immersive Simulation in Medical–Clinical Education

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ABSTRACT

With the advancement of technology, digital gadgets have progressively become tools for educational pedagogy, enabling the widespread application of virtual reality (VR) and augmented reality (AR) in healthcare education. Neurological rehabilita-

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tion, telemedicine, psychotherapy, medical education, and surgical simulation are among the fields in which VR and AR are used. Studies have shown that VR and AR can reduce medical errors resulting from incompetent medical personnel, lessen the inconvenience of traditional medical care, and save medical education and training costs. The application has improved the quality of diagnosis and treatment, raised the bar for medical education and training, and strengthened the bond between clinicians and patients. In an effort to assist clinical professionals in enhancing the standard of care they provide, this study integrates VR and AR technologies into medical-clinical practice, utilizing Actor Network(ANT) model to develop a conceptual framework for the implementation of AR/VR pedagogy simulation on artificial intelligence training platform.

1. INTRODUCTION

In order to ensure the overall development of students in higher education, awareness of augmented reality (AR) and virtual reality (VR) based educational pedagogy explanations for quality assurance have been researched using a theoretical and practical approaches(Paiva, Golçalves, Rodrígues, & Rosa, 2024). Regarding the use of AR and VR tools for quality assurance in higher education, a thorough evaluation of prior studies and literature have been conducted. Content analysis was one of the study's research tools, establishing awareness of VR and AR-based quality assurance in higher education for students' holistic engagement and participatory interactivity. Higher education must become more knowledgeable about VR and AR-based quality assurance technologies in order to support students' holistic growth in the diverse subject areas(Oyekunle, Ugochukwu, Rosa, Rodriguez, & Fatai, 2024). A competitive race exists in education, but by raising the standard of instruction, this competition can be positively shaped to support students' actual growth. Using content analysis, a thorough and methodical examination of the material was conducted in order to highlight the necessity of genuine quality assurance in higher education for the students' overall development and growth. Modern technologies are used in conjunction with immersive learning methodologies to create engaging and dynamic learning environments(Matthew, Kazaure, & Okafor, 2021),(Matthew, Kazaure, Kazaure, Onyedibe, & Okafor, 2022). The effect of the engagement on education should increase as a result of this combination, making the learning environment more productive and immersive. Innovative technologies like VR and AR