**3D LEARNING IN WEB APPLICATIONS: ENHANCING USER ENGAGEMENT AND KNOWLEDGE RETENTION**

**ABSTRACT**

The advent of 3D technologies has significantly transformed various industries, and its integration into web applications offers new opportunities for interactive learning experiences. This paper explores the use of **3D learning** within **web applications**, aiming to enhance user engagement and improve knowledge retention. Traditional educational tools often rely on passive forms of content delivery, such as text and images, which may limit learner interaction and immersion. By integrating **three-dimensional models, animations, and interactive simulations**, web applications can foster a more dynamic learning environment, allowing users to engage actively with the content. The paper investigates various domains where 3D learning has proven effective, including medical education, engineering, architecture, and e-commerce. We examine key technologies, such as **WebGL** and **WebXR**, that enable the creation of 3D environments directly within the browser without requiring additional plugins. Additionally, the paper explores the impact of 3D learning on cognitive processes, highlighting how immersive experiences improve spatial understanding, problem-solving skills, and memory retention. The challenges of implementing 3D learning in web applications, including performance optimization, device compatibility, and accessibility, are also discussed. The paper concludes by proposing a framework for developing 3D learning web applications that prioritize user experience, accessibility, and scalability, making advanced interactive learning more widely available and effective.