Chapter 12
Immersive Whale Odyssey: A 360° Underwater VR Adventure for Eco-Tourism

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ABSTRACT

Virtual Reality (VR) technology immerses users in simulated environments through specialized headsets and sensory equipment, offering highly interactive experiences. This study, conducted at Christ University, Bengaluru, between December 2023 and January 2024, focused on the Blu: Whale Encounter 3D 360 VR App, utilizing the Meta Quest 2 headset. Purposive sampling recruited 205 students aged 18-25. The Virtual Experience Questionnaire measured virtual experience as the independent variable, while feedback, concentration, and challenge were assessed using the EGameFlow scale. Correlation and linear regression analyses explored the relationships between variables. Results revealed positive correlations between virtual experience, feedback, challenge, and concentration. Virtual experience strongly predicted feedback and challenge, while also significantly influencing concentration levels. However, a weak negative correlation between feedback and concentration suggested limited practical significance.

INTRODUCTION

Virtual Reality (VR) is a groundbreaking technology that immerses users in a simulated environment, typically through specialized headsets and sensory equipment. By transporting individuals into digitally crafted worlds, VR offers a highly immersive and interactive experience, capable of simulating real-life

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scenarios or creating fantastical realms (Kunnumpurath, Menon, et al., 2024). This technology allows users to explore and interact with their surroundings in unprecedented ways, blurring the lines between the virtual and physical worlds. In eco-tourism, VR presents a unique opportunity to enhance environmental awareness and conservation efforts. By leveraging VR's immersive capabilities, eco-tourism initiatives can provide virtual experiences that showcase the beauty and importance of natural habitats, such as the oceanic realm home to majestic creatures like whales. Through virtual encounters with marine life, users can develop a deeper appreciation for the marine environment and understand the significance of preserving it for future generations. This study aims to evaluate the effectiveness of immersive virtual environments, specifically through a 360° Incredible Close Whale Encounter Underwater VR Experience, in promoting sustainable tourism and fostering conservation awareness. By assessing the level of immersion and engagement participants experience during the virtual whale encounter, researchers can gauge the potential of VR as a tool for environmental education and advocacy. Understanding VR's impact on participants' perceptions and behaviors towards eco-tourism can inform the development of future initiatives that harness technology to support conservation efforts and promote responsible travel practices. The objective of the book chapter is to investigate the linear relationships between virtual experience and feedback, challenge, and concentration in the population.

Review of literature

Traditional methods of assessing user satisfaction in virtual learning environments have proven inadequate (Aguirre et al., 2014). Consequently, the experimental group in this study will receive more specific feedback based on data obtained through virtual reality simulations (Jeong et al., 2021). It is important to consider various factors influencing the formation of flow, including the intrinsic characteristics of the mediated environment, users' assumptions and perceptions before entering the flow state, and the consequences of the flow experience (Cheng et al., 2014). Interestingly, research by Loureiro Krassmann et al. (2020) found that the sense of presence and immersive tendencies did not significantly impact learning gain. Goal-based tasks and interaction with the environment can enhance attention and increase immersion in virtual experiences. When users have clear objectives or goals to achieve within a virtual environment, they are more likely to focus on relevant tasks and activities. This goal-oriented approach encourages active engagement and cognitive involvement as users strive to accomplish specific outcomes or complete designated challenges (Radianti et al., 2020). Interaction with the virtual environment further intensifies engagement and immersion. Allowing users to manipulate objects, navigate through spaces, and interact with virtual elements enhances their sense of presence and agency. This hands-on engagement fosters a deeper connection with the virtual world, as users feel actively involved in shaping their surroundings and influencing outcomes (Dwivedi et al., 2022). The combination of goal-based tasks and environment interaction creates a sense of purpose and relevance within the virtual experience. When users perceive their actions as meaningful and impactful towards achieving overarching goals or objectives, they are more likely to remain engaged and invested in the experience. This sense of purpose enhances motivation and encourages sustained attention over time (Morrison-Smith & Ruiz, 2020).

Goal-based tasks and interaction with the virtual environment have been recognized as strategies to enhance attention and potentially increase immersion (Sweeney & Adams, 2009). When users are presented with clear objectives or goals within virtual environments, they are more likely to focus on relevant tasks, deepening engagement and cognitive involvement. The structure of tasks and the provision of feedback