Student Perspectives on the Use of Metaverse in Earthquake Teaching

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Abstract

The objective of this study is to examine in detail the situations that students may encounter in their learning processes and their experiences in this process through virtual reality-based earthquake simulations offered by Metaverse technology in teaching the earthquake topic in the "Natural Disasters" unit of the 4th grade Social Studies course. In accordance with this overarching objective, the issues, accomplishments, and student perceptions that arose during the course of the students' engagement with the earthquake subject in the Metaverse environment were meticulously analysed following the implementation of the application.

The study employed the conventional case sampling method to determine the sample. A group of six students enrolled in the fourth grade at a public school in the 2024-2025 academic year was selected for this study. Prior to the application, the necessary permissions were obtained from the parents.

In this study, the earthquake simulation platform, "Earthquake VR", was utilised as a virtual reality application that simulates natural disasters in the Metaverse environment. The qualitative research method was adopted in the study. Throughout the entire process, the researcher participated in the role of "teacher researcher" and the applications were executed directly with in-class interactive virtual reality applications. A semi-structured interview form was utilised to collect the data following the application, and the qualitative data obtained were evaluated with descriptive analysis.

The findings indicate that earthquake simulations in the Metaverse environment facilitate student comprehension of the subject matter and contribute to the conceptualisation of abstract concepts. Students acquire proficiency in appropriate behaviours to be adopted during an earthquake, while also developing an understanding of the subject. The interactive environment enhances students' interest in the lesson and renders the learning process more enjoyable. Initially, students experience difficulty acclimatising to the virtual reality environment and encounter technical challenges; however, over time, they adapt to this environment. Furthermore, students indicated that the absence of Turkish support for the language and instructions of the VR glasses served as a complicating factor.

In light of the research findings, the following recommendations can be put forward:

- The ergonomics of virtual glasses should be enhanced to minimise physical discomfort.
- The simulations in the application should be diversified, and students' reactions to different situations should be improved through the use of varied scenarios.
- The instructions in the virtual environment should be simplified, and distractions should be reduced.
- Students should be supported to gain practical experience in these processes before, during and after the earthquake.

It was determined that utilizing earthquake simulation-based teaching in a Metaverse environment resulted in a notable enhancement of students' knowledge, awareness, and skill levels. However, it was also concluded that this process could be further optimized through the implementation of certain technical and contextual modifications. The potential of technology-supported learning environments to enhance the efficacy of Social Studies courses is considered to be a significant contribution to the field.

Keywords

Earthquake, Metaverse, Virtual Reality, Student Perspectives, Earthquake Simulation.

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