# Enhancing disaster resilience through immersive tsunami evacuation training using virtual reality

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## ABSTRACT

Natural disasters, particularly tsunamis, pose significant threats to coastal regions. Traditional evacuation drills have limitations in terms of frequency and inclusivity, especially for transient populations. This research explores the use of Virtual Reality (VR) in conjunction with Google Street View to enhance tsunami evacuation training, making it more accessible for residents and visitors. This study utilizes Google Street View to create 360-degree virtual environment mirroring tsunami-prone areas in Patong, Phuket province, Thailand. Participants were briefed on tsunami history, inundation zones, and evacuation strategies before immersing themselves in the VR environment. Equipped with VR headsets, the five middle school students, who had never been to Patong before, navigated the virtual landscape to identify safe evacuation routes. The results showed that these participants took an average of 8 minutes to cover a 1-km path, which is twice as fast as in reality. Observations of signage varied, with some participants identifying none and others spotting up to three signs. In conclusion, combining VR with Google Street View offers an innovative and inclusive solution for tsunami evacuation training, addressing the limitations of traditional drills and providing a virtual experience for participants. This method can further enhance accessibility, especially for transient populations. Further research comparing virtual and on-ground drills is warranted to assess the comprehensive impact and broader implementation potential.

**Keywords**: Tsunami Evacuation Drill, Virtual Reality, Thailand

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