

Immersive Virtual Reality for START Triage Training in Health Sciences: Design, Implementation, and Initial Evaluation in Flood Scenarios

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Introduction

Virtual Reality (VR) provides safe, controlled training for emergency response. We present an educational intervention to train healthcare staff in START triage during DANA floods, evaluating its pedagogical and assessment value.

Methodology

A first-person VR scenario simulating a sudden urban flood was developed for health sciences training. Users navigate toward a safe triage area while responding to key decision points on scene safety, initiation of the START algorithm, prioritization, and patient evacuation. A multi-phase validation protocol was applied, including content validation by a panel of ten healthcare and education experts. The system automatically records decisions, response times, and errors, enabling its use as an objective assessment tool in educational settings.

Results

The scenario includes six simulated patients with profiles representing all START triage categories: black, red, yellow, and green. The immersive experience requires users to apply clinical reasoning in a disaster context, including scene safety, hemorrhage control, respiratory assessment, triage sequencing, and prioritization of care. User interactions transform the simulation into a performance-based assessment tool, automatically recording completion time, errors, decisions, and movement pathways. The expert panel supported the initial content validity of the scenarios. The platform also provides formative feedback, creating a standardized framework for comparing learning outcomes across health sciences students and professionals.

Discussion and conclusion

This VR-based educational experience integrates core START triage competencies within a realistic flood disaster scenario relevant to healthcare training. Its main innovation lies in combining clinical realism, learner safety, standardization, and measurable performance outcomes. The tool represents a promising resource for teaching and evaluating disaster response skills in health sciences education and supports future research on usability and competency-based assessment in emergency training contexts.

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Abstract as accepted by the congress, reproduced by the VR Balance consortium as related work of the University of Barcelona team: the immersive scenario was developed by MetaMedicsVR, the technology partner of **VR Balance: Advancing Gender Equity in Work and Home Life through Virtual Reality** (project 101191101, funded by the European Union under CERV-2024-GE). This communication is not an output of the VR Balance grant; its funding is the one stated by the authors. More publications and the course handbook: metamedicsvr.com/projects/vr-balance/dissemination/#research