

TRANSFORMING HEALTHCARE EDUCATION: ENHANCING COMMUNICATION SKILLS THROUGH IMMERSIVE VIRTUAL SIMULATION

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Introduction

Effective communication is essential for healthcare students to interact with patients and provide quality care. However, chances for students to practice these skills are often limited by time and clinical exposure. To overcome this, SCIMORT, a 3D immersive virtual simulation chatbot, was developed to provide radiotherapy students realistic practice with virtual patients. Virtual patient simulations offer safe, controlled, and lifelike training experiences. Thus, this study aimed to evaluate student acceptance and engagement with SCIMORT.

Methods

The development of SCIMORT was conducted in two phases. In Phase 1, a prototype virtual patient was designed using Blender and Bot Libre, incorporating both voice and visual cues to simulate authentic patient interactions. In Phase 2, a pilot test was conducted among Year 1 to Year 4 undergraduate students from the Diagnostic Imaging and Radiotherapy program at Universiti Kebangsaan Malaysia. Ethical approval was obtained from the university research ethics committee (JEP-2021-761). Student participation was voluntary, and they were required to complete as many scenarios as possible before answering the survey.

The survey consisted of three sections such as demographic information, user acceptance, and user engagement. Acceptance items were adapted from a telehealth usability tool, while engagement items were adapted from a validated instrument. Both sections used a five-point Likert scale ranging from strongly disagree to strongly agree. Data were analyzed using descriptive statistics, which was appropriate for the small sample size.

Results

A total of 28 students participated, with 13 in the novice group, with no prior clinical experience and 15 in the experience group, with clinical experience. Both groups reported positive perceptions of acceptance and engagement. The experience group recorded slightly higher mean scores in acceptance and engagement compared to the novice group (Table 1). Furthermore, both groups agreed that SCIMORT represents an acceptable and promising tool for communication skills training.

Table 1. Users' Acceptance and Engagement between Novice and Experience Groups

Users' Acceptance and Engagement	Novice Group (Mean $\pm$ SD)	Experience Group (Mean $\pm$ SD)
User's Acceptance	3.919 $\pm$ 1.245	3.953 $\pm$ 1.114
User's Engagement	3.526 $\pm$ 1.270	3.568 $\pm$ 1.142

Discussion

Findings indicate that students perceived SCIMORT as an acceptable and engaging tool for communication skills training. This suggests that prior clinical exposure may increase students' ability to appreciate and benefit from simulated patient interactions. The novelty and contribution of this study is the introduction of a 3D immersive chatbot that provides a flexible, safe, and scalable platform for communication practice in radiotherapy education. Limitations include the small sample size and single-institution, thus future studies should test SCIMORT with larger, and multi-institutional cohorts. In conclusion, further development should focus on incorporating advanced AI-driven responses, personalized feedback, and immersive VR features to improve realism and learning effectiveness.

Keywords: Virtual patient, immersive learning, user engagement, user acceptance, communication skill