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Infection Prevention and Control (IPC) Education Using XR (Mixed Reality) for Small and Rural Healthcare Facilities

Morgan Shradar[1], Tess McKinney[2], Jody Scebold[2], Lauren Hinkle[1], and Angela Vasa[1]

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Abstract

The development of high-quality, immersive educational content with extended reality (XR) technologies to address specific gaps in infection control practices is essential for small and rural hospitals. The need for specialized education for Infection Preventionists (IPs) in these settings to conduct risk assessments and evaluate sterile processing departments (SPD) and procedures emerged from a 2016 gap analysis and an IPC Needs Assessment in 2021. This education is designed to improve the IP's SPD knowledge, practices, and skills. The XR education offers three delivery modes: a virtual reality headset, personal computer, and mobile devices (e.g., tablet or cellphone), providing flexibility in how content is delivered based on user preference and organizational access. The XR environment is modeled after an active community hospital's SPD, providing a more realistic and immersive experience for the learner. Within this XR platform, the SPD environment can be customized to reflect the specific settings of the learner, including configurations of single or double-room SPDs with designated dirty, clean, and sterile areas. The immersed learner follows detailed steps to identify the intended learning objectives within each space. Each room offers unique interactions for the user to engage with, facilitating adaptive learning as they navigate each area. The educational content is based on Benner's theory of moving from novice to expert, with all modules featuring SMART objectives and a post-education assessment. Two modules have been completed and prepared for a pilot phase to evaluate the accessibility of immersive equipment, user experience, preferred content delivery method, and the effectiveness of the education. Following the pilot, adjustments will be made based on feedback, and additional modules will be developed to meet the identified needs of the target population.

[1]Nebraska Medicine
[2]University of Nebraska Medical Center

Corresponding Author: Morgan Shradar
Email: mshradar@nebraskamed.com