Empowering Nursing Education with HoloLens: Enhancing Simulated Practice Learning at Anglia Ruskin University

3/10/2023 Sian Shaw [ss35@aru.ac.uk]

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Introduction to HoloLens: Augmented Reality Redefined

In the rapidly evolving landscape of technology, Microsoft's HoloLens stands as a beacon of innovation, fundamentally transforming how we perceive and interact with the digital world. HoloLens is not just a device; it is a gateway to a new dimension of reality, where the physical and digital realms seamlessly converge. Through augmented reality (AR), HoloLens empowers users to see, hear, and interact with holographic objects and information in their real-world environment.

At its core, HoloLens is a head-mounted display that blends the physical and virtual worlds, offering users an immersive and interactive experience. Unlike virtual reality (VR) devices that immerse users entirely in a digital environment, HoloLens enhances the real world with holograms, allowing users to maintain their connection to the physical space while overlaying digital information, simulations, and interactive elements.

What HoloLens Does

Spatial Mapping: HoloLens scans and maps the user's surroundings in real-time, creating a spatial understanding of the environment. This allows holograms to interact with physical objects and surfaces, enhancing realism and usability.

Holographic Display: HoloLens features a high-resolution, see-through display that projects holographic images into the user's field of view. These holograms appear as if they exist in the same physical space as the user, making them tangible and interactive.

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Gesture and Voice Control: Users can interact with holographic objects using gestures and voice commands, providing an intuitive and hands-free interface. This capability enables a wide range of applications, from gaming to professional tasks.

Remote Collaboration: HoloLens facilitates remote collaboration by enabling users to share their holographic experiences with others in real-time. This is particularly valuable for collaborative work and education.

Mixed Reality Apps: HoloLens supports a diverse ecosystem of mixed reality applications, from educational tools and medical simulations to industrial training and design prototyping.

Integration with Microsoft Ecosystem: HoloLens seamlessly integrates with Microsoft's suite of productivity tools, including Microsoft Teams, enabling users to collaborate and access relevant information within the AR environment. It is this functionality which requires the use of Dynamics Assist that Anglia Ruskin University is most interested in. This is because it is adaptable to meet the needs of simulating placement experiences for cohorts ranging from small, intimate

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Project outline:

Aim

The HoloLens project in the Faculty of Health, Education, Medicine and Social Work aims to integrate HoloLens technology into health care education at Anglia Ruskin University to enhance the quality of simulated practice learning for student nurses.

Objectives:

1. Integration of HoloLens: To successfully integrate HoloLens devices with existing nursing education resources.

2. Development of simulated scenarios: To create a library of simulated scenarios covering various nursing situations.

3. Microsoft Teams Integration: To seamlessly integrate HoloLens with Microsoft Teams meetings using Dynamics Assist for remote and collaborative learning.

4. Community Placement Experience: To enable students to engage in realistic community placement experiences through integration of HoloLens and Microsoft Teams

5. Interprofessional Learning: To promote interprofessional learning opportunities and collaboration by involving other healthcare disciplines in the simulation scenarios.

6. Benefits Assessment: To assess the benefits of HoloLens-enhanced simulated practice learning for students, academics, and service users.

7. Evaluation Plan: To implement a comprehensive evaluation plan to measure the project's success and identify areas for improvement.

Project update 03/10/2024

Integration with Microsoft Teams using Dynamics Assist:

The School of Nursing in HEMS currently owns three HoloLens. IT development services at Anglia Ruskin University have worked to integrate HoloLens into Microsoft Teams using the proprietary software Dynamics Assist and some additional bespoke in-house programing. This allows students and educators to participate in simulated practice learning sessions, view scenarios in augmented reality, and interact with holographic patients. Dynamics Assist enables real-time communication, feedback, and data sharing, enhancing the overall learning experience.

Integration with existing learning resources

Files including video, audio, images and documents uploaded into OneDrive in the ARU ecosystem can be opened by the HoloLens wearer as Holographic objects within the environment and engaged with by students during the simulated practice learning experience. This has facilitated integration with existing learning resources.

Further learning and debrief sessions are facilitated following the Holographic simulation outside the immersive environment.

Community Placement Experience:

We have successfully used HoloLens for a community simulated practice learning experience for student nurses in a service users' home.

We have demonstrated that HoloLens can replicate a realistic community placement experience, offering students the opportunity to apply their knowledge and skills in a community setting. We are currently exploring opportunities for collaborating with community placement partners to use HoloLens in diverse community settings working with interprofessional teams. These will expose students to various healthcare challenges, improving their adaptability and readiness for real-world situations.

GigXR Holloman is an innovative educational platform that holds immense potential for healthcare education. We have evaluated the use of Holohuman withing the Microsoft team's environment. HoloHuman leverages augmented reality (AR) and mixed reality (MR) technologies to create immersive learning experiences for healthcare students. It allows users to interact with detailed 3D images.

We have evaluated Integrating Holohuman with MS teams enabling multiple students to engage with a single deteriorating patient scenario simultaneously. This platform offers realistic clinical scenarios in a virtual environment. Students can practice diagnosing and treating patients, making critical decisions, and honing their clinical skills in a risk-free setting. Integrating HoloHuman into MS Teams allows for seamless collaboration among students and educators. They can engage in group discussions, share insights, and work together on complex healthcare cases, regardless of their physical location. We are now ready to pilot this functionality with groups of students.

Assessment and Evaluation: We are exploring how HoloHuman could also be used to create assessments that evaluate students' knowledge and decision-making abilities in real-world healthcare situations. These assessments could be integrated into the Canvas LMS for grading and tracking progress.

Initial benefits identified for Students, Academics, and Service Users:

Students:

- Enhanced practical skills and confidence.
- Exposure to a wider range of patient scenarios.
- Increased readiness for real clinical settings.

Academics:

- Improved teaching effectiveness through immersive technology.
- Enhanced assessment and feedback mechanisms.
- Increased student engagement and motivation.

Service Users:

- Better-prepared healthcare professionals.
- safety and quality of care.

Evaluation Plan:

The project's success will be evaluated using a mixed-methods approach:

- Quantitative Data: Assessment scores, student surveys, and usage statistics will be analysed to measure student performance and satisfaction.

- Qualitative Data: Focus groups and interviews with students, academics, and service users to gather insights on their experiences.

- Technical Performance: Continuous monitoring of HoloLens functionality and Microsoft Teams integration.

- Cost-Benefit Analysis: Evaluation of the project's cost-effectiveness.