

# Could extended reality haptics be used for healthcare education? A survey

Marc Gilbey<sup>1</sup>, Professor Shea Palmer<sup>2</sup>, Dr Christopher Newton<sup>3</sup>, Professor Louise Moody<sup>4</sup>, Dr Ksenija Maravic da Silva<sup>5</sup>

**Abstract—** Extended Reality (XR) haptics education is an evolving area, but little prior research has evaluated end users' views of the application of this technology in healthcare education. This survey explored healthcare educators', clinicians', and students' knowledge of XR haptics, and their views on potential applications, barriers, and enablers to its use within healthcare education. Preliminary findings suggest a lack of awareness of XR haptics but adequate interest for use within healthcare education. The barriers and facilitators to this technology are presented. Further results will be reported in future publications.

## I. INTRODUCTION

When developing the manual skills of professional touch, healthcare students learn by observing and copying an expert tutor performing the techniques on healthy individuals, with no history or clinical context in which to test and expose them to real world scenarios. Current approaches have been criticised as inadequate (1, 2). It is therefore essential that new methods and approaches are developed to provide a more enriching, immersive, and realistic learning experience. XR haptic healthcare devices are already being used, but mainly within surgery and application to other aspects of healthcare has received little attention. This study sought to better understand the use of XR haptics in 'hands-on' care, such as professional touch (examples include palpation, joint mobilisation, and taking pulses). Specifically, it explored the potential application to hands-on care such as professional touch as well as barriers and facilitators to inform the development of an XR simulation scenario.

## II. SURVEY AIMS AND OBJECTIVES

This survey aimed to explore the views and knowledge of healthcare academics', students', and educators' of XR haptics use in healthcare education.

The objectives were to:

- Determine participants' knowledge of XR haptic technology and their understanding of applications to healthcare education.
- Explore the barriers and facilitators to implementation in healthcare education.
- Explore participants' ideas on clinical simulated scenarios of value.

## III. DATA ANALYSIS AND REPORTING

A preliminary analysis of the survey data has been completed and is described here. Demographic data of participants is reported descriptively. Survey data was reported using frequencies and percentages. Content analysis of all free text data has yet to be conducted, but results will be reported in future publications.

## IV. RESULTS

176 Participant completed the survey (43 students, 99 clinicians, and 34 educators) (43 male, 133 female).

Preliminary key findings indicate:

- 67% (n=118) unaware of XR haptic technology and 88.6% (n=156) had never used XR haptics in healthcare simulation before.
- 88.6% (n=156) want to see XR haptic technology within healthcare education.
- 95.5% (n=168) report touch is an important part of XR education and that XR haptics would provide a fun (95.5%, n=168) and safe place to learn (90.9%, n=160).
- Interestingly, the majority of participants would feel safer and more comfortable practicing professional touch in XR compared to traditional approaches.
- Qualitatively the barriers included lack of educators, lack of simulation resources and lack of opportunity to use them.
- Qualitatively the enablers included access to educator support and training and use within the curriculum.

## V. CONCLUSION

The results are pivotal for the next step of creating and implementing an evidence based XR haptic user case that meet the needs of the users.

## REFERENCES

- [1] Jhaveri, V., Currier, F., & Johnson, J. (2020). Bridging the Gap between "Do One" and "Teach One": Impact of a Procedural Objective Structured Teaching Encounter on Resident Procedural Teaching Proficiency. *Medical Science Educator*, 30, 905-91
- [2] Missen, K., McKenna, L., Beauchamp, A., & Larkins, J. A. (2016). Qualified nurses' rate new nursing graduates as lacking skills in key clinical areas. *Journal of clinical nursing*, 25(15-16), 2134-2143.

1. School of Health, Coventry University, UK (ad3678@coventry.ac.uk)  
2. School of Healthcare Sciences, Cardiff University, UK  
3. Centre for Care Excellence, Coventry University and University Hospitals Coventry & Warwickshire NHS Trust, UK  
4. Research Centre for Arts, Memory and Communities, Coventry University, UK  
5. Research Centre for Healthcare and Communities, Coventry University, UK