



It's Snazzy, but is it Useful? Practitioner's Views on Meaningful Use Cases for Healthcare XR

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Abstract. The global virtual reality (VR) market size, valued at 21.83 billion USD in 2021, is expected to expand with an annual growth rate of 15.0% from 2022 to 2030. Virtual Reality, although massively known for immersive gaming and entertainment, has revolutionized education and training during the last years in many fields. In medicine, VR has been used from the simulated reconstruction of organs to preoperative planning and from teaching anatomy to rehabilitation.

eXtended Reality (XR) healthcare resources are enthusiastically accepted from healthcare learners and teachers alike. However, they still are not mainstream into formal academic curricula. The core precept for curricular integration is educational justification. In short, the question is whether the cost of an impressive VR resource will be returned as educational efficacy.

Pivotal for positive reply in this question is the correct design of the educational resource for each use case. Is XR appropriate for clinical, manual skills, or decision-making training? Would you choose an exploratory «Human Atlas» for anatomy teaching or an interactive case study? How much «game» do you need in your educational experience? These are all questions that so far have been answered ad-hoc based on intuitive needs of the practitioners.

This panel will present the results of the first healthcare practitioners' workshop that was co-organized by iLRN and several healthcare institutions to tackle these questions. Based on practitioner's feedback, a select group of panelists will open the discussion to the audience of the conference for identifying features and practices for optimal XR design for healthcare use cases.

Keywords: Virtual Reality, Augmented Reality, Healthcare Education, Curricular Integration, XR Use Cases, Immersive Resource Design.

1 Introduction and Relevance

In the area of healthcare education, virtual reality and other immersive media have established themselves as recognized immersive learning modalities. Its cognitive and affective effects are recognized [1–4]. Affectively, VR encourages participation, but it also excels at visualizing complex, occasionally abstract concepts and mechanisms to create a scientific paradigm [5, 6]. But there is a cost associated with this audiovisual immediacy.

Even with the COVID-19 financial hardship, the global healthcare market stabilized in 2021 at USD 1.207 billion, with an estimate for 2028 at USD 11.658 billion [7]. To put the financial aspect of these figures into

context, in 2019 a VR evacuation protocol training exercise cost \$106 387.00 [8]. Due to the material's reuseability and the ongoing costs of each live training exercise, this resource was made sustainable.

Technologically, means and methodologies have been evolving rapidly towards timely and cost-effective resource development. Toolkits like the MAGES SDK [9] and ubiquitous deployment game engines like Unity and Unreal3D have accelerated tremendously technical development alleviating technical overheads in implementing XR resource designs.

However, the issue of valid and streamlined design of XR resources in healthcare, still remains unanswered. Within the context of healthcare education co-creative frameworks such as ASPIRE [10] have been explored with promising but not prolific yet results. What we are currently missing is a cohesive and streamlined participatory methodology for educators, content experts and technologists to work together, swiftly create and iterate on a resource and finalize much faster than currently possible.

2 Aims and Target Audience

This panel will present results, outcomes and insights from the 1st MedEd VR workshop about Building Meaningful VR User Experiences in Healthcare Education that was jointly organized by the authors. In that workshop we presented the first iteration of a bespoke XR features framework for supporting modular, collaborative design of XR resources between all stakeholders both educational and technical. This framework can support the conceptualization of a multitude of XR resource types, based on a wide range of educational use cases and episodes (see. Fig.1). The aim of this panel is to engage the practitioners, kick-off a discussion about its usefulness and drive future iterations towards an effective framework of XR healthcare educational experience design.

The panel is aimed at all practitioners in the educational XR development pipeline. Educators, content experts, educational technologists and coders can offer their perspectives on what features drive the design of an XR resource, what educational and medical “components” define an healthcare educational use case and how these building blocks can facilitate quick and cost-effective XR resource development.

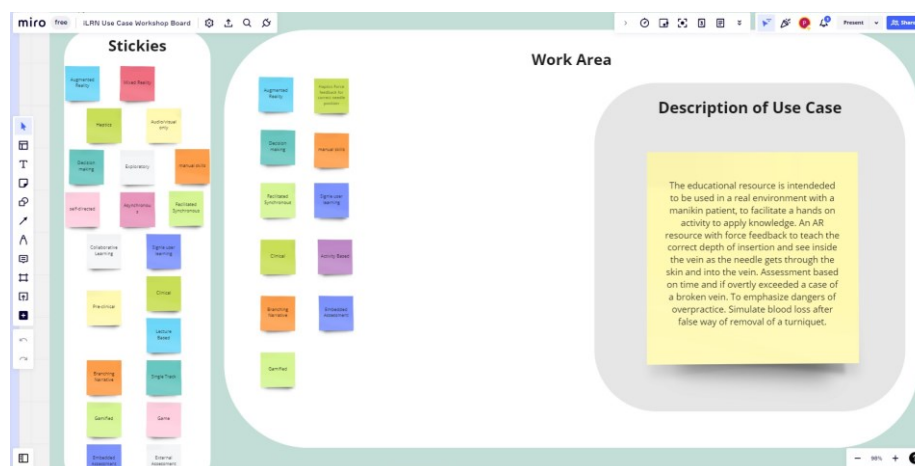


Fig. 1. A snapshot of the interactive features storyboarding that uses the XR features and components framework. The participants build their XR experience through sticky “tags” which later guide them on writing the actual concept and storyboard.

3 Panel Description and Expected Results

The panel will follow a mixed format. It will be coordinated by the 2nd author of this work. Its first part will offer a small introductory presentation from senior panelists (authors #5 and #6) for approximately 10 minutes each. Both talks will emphasize on the state of play in XR medical education both in general and specifically for the healthcare education space. After that, and for about 20 minutes the audience will be introduced by the facilitating team to the collaborative storyboarding approach through the use of online tools (namely a pre-prepared miro-

board). After this interaction the 1st contributor of this work will present the elements of the first iteration of the XR features and components framework that the participants already experienced in the previous interactive demo. Participants will interact in the presentation with the help of polling software in order to interact, grade and update elements and features of the framework.

Results from this activity are aimed to be both a deeper understanding of the expected use of the framework as well as giving power to practitioners for altering and augmenting its features.

4 Facilitators and Conclusions

The panel speakers and facilitators comprise a diverse pool of educators, academics and researchers with a strong technical background and extensive experience in crafting immersive experiences with focus on learning efficacy. The panelists have participated and collaborated in several transnational projects on creating technology enhanced immersive resources for healthcare. In that context they bring both their academic experience and their practical insights as kick-off points for the audience to discuss and reflect upon.

XR resource design and development used to be a mainly technical endeavor with “requirements elicitation” being an important but uncomplicated part of the process. After a maturation period, it has become apparent that a core challenge for XR educational content was proving their objective educational efficacy [11]. In that context this panel aims to expand upon existing work [12] and extend the discussion between practitioners on a common framework for participatory design and development of XR healthcare resources. Through this discussion, it is envisioned that a streamlined co-creative methodology will bring together medical teachers, content experts and coders to a cohesive rapid and iterative workflow for educationally impactful healthcare XR resource development.

Acknowledgements

This work is supported by the ERASMUS+ Knowledge Alliances for higher education “Evaluating Novel Tangible and Intangible Co-creative Experiential medical education” (ENTICE) (612444-EPP-1-2019-1-CY-EPPKA2-KA), INADVANCE also!

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