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Immersive Worlds: Inquiry Learning Through the Use of AR, VR, and XR

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Abstract. This presentation addresses the implementation of immersive learning in a K-12 STEM and Inquiry classroom. The creation of these spaces by students demonstrates the importance of the co-construction of learning experiences and the collaboration that can occur when even our youngest learners are introduced to the right tools in a carefully scaffolded framework. The skills demonstrated are vital for preparing the next generation for the immersive worlds of the future, whether it be education, social, recreational or workplace related.

Keywords: Virtual, Augmented, Extended, Blended, Reality, Technologies, Virtual Reality, Mixed /Augmented Reality, 360-degree photo or video, Robotics, Pedagogical / Learning-focused, Interdisciplinary, K-12 (primary).

1 Introduction

Over the past few years, the staff and students of Knox Grammar Preparatory school have been exploring AR and VR to enhance and deepen inquiry learning experiences. During 2021 the school has been further redefining virtual learning experiences through the creation of online workshop spaces on an extended reality (XR) web platform. This innovative approach allows the entire school community to engage with students in both synchronous and asynchronous experiences. Through this new medium, students can not only showcase online galleries of their final products but also explain the steps they followed in the inquiry process and demonstrate a wide variety of developing skills and competencies. Example of the extended reality platform developed by the Knox Prep students https://framevr.io/knoxpreppresentations.

The school has a focus on students being the creators and curators of the content in these virtual platforms as working collaboratively in this way develops future-focused dispositions and a highly agile skillset. Putting this into practice, students from across the grades recently ran live events in this virtual space, delivering tutorials to an audience of educators at a range of conferences around the world. They ran digital and design

technology workshops at the 7th International Conference of the Immersive Learning Research Network (iLRN 2021) and also at the International Society for Technology in Education Conference (ISTE 2021). The students were able to connect with participants in different parts of the world and ran engaging professional learning experiences which have since resulted in other schools adopting these technologies. Providing opportunity for our students to participate in virtual events such as these also forms an integral part of the school's drive to connect and form collaborations with communities in other parts of the world.

2 Audience and Outcomes

2.1 Audience

The target audience is K-12 educators, Software/Platform Developers. We will explore examples of creation within VR/AR current platforms and experience the future of extended reality as a way of engaging the school community at all levels. Kindergarten to Year 6 students will guide participants through a range of virtual, augmented, and extended reality projects. Sharing creativity in extended reality and coding simulations within virtual platforms will be discussed. Resources for implementing VR/AR and extended reality in an inquiry classroom will be provided.

2.2 Outcomes

The audience will gain an understanding of best practice methods of implementing virtual, augmented, and extended reality platforms into a K-12 education environment. A focus will be on inclusive activities which allow all students to engage and participate whilst allowing personalization and individualized learning to occur. This workshop is future focused, specifically targeting developing the skills and competencies within students ahead of their future endeavors in the interactive online immersive virtual spaces of the future.

3 Additional Information

To prepare for this presentation ahead of the hands-on workshop, please:

1. Check you have the latest version of the Chrome browser
2. Access the following site to familiarize yourself with how to move around https://framevr.io/
3. Check the top right corner menu (3 lines) containing all the links and resources you need

4. Sign-in to FRAME with the Single Sign-in option of your choice (Google/Microsoft)
5. Complete the ‘Your Info’ section of Frame so students and other participants can identify to whom they are speaking
6. Access and bookmark the following sites: https://learn.framevr.io, https://learn.framevr.io/resources, https://framevr.io/promoting student agency (Single user XR Frame- asynchronous, use Google Chrome), https://framevr.io/knoxpreppresentations (Multiuser XR Frame- synchronous, use Google Chrome).