

Diverse Designs Create Liveable Cities: An Inquiry Learning Unit Utilizing VR/XR Platforms to Explore and Create

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Abstract. In their first inquiry unit of 2022, Year 5 students at Knox Prep investigated the big idea Diverse designs create livable cities. A study into how cities are creatively designed to enhance livability and support diverse communities. The students explored the immersive use of virtual reality and augmented reality platforms to help initially explore and then ultimately demonstrate the depth of their understanding of the topic. In the finding out phase of their learning, the students learn the skills of assessing the livability of a city and then research how they might go about improving sustainable and inclusive practices within a city. Case study of Singapore Students explored existing architectural designs and city planning considerations to ensure they develop the concepts of empathy and inclusivity when thinking of the world's diverse communities. Students looked at specific examples of designs that were diverse. The students explored virtual space with the guiding questions - what designs did you notice? What is the impact of these designs on the city? What makes this city appealing to the population? The big idea of this unit is Diverse designs create livable cities and that the concepts are design, creativity, and inclusion. By encouraging the students to use virtual environments we are further aligning the learning experience with one of the unit's concepts of inclusivity. The virtual environment of Frame VR enables students to demonstrate their understanding on a platform that all can access without the need for high-end VR headsets.

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

As a primary school learning community of 770 students, we value becoming an inclusive and robust global community for immersive learning. Many of our students are from diverse backgrounds, have family dispersed around the world, and many family environments are

made up of non-English speaking parents or grandparents. The 24/7 nature of WebXR spaces mean that visitors can engage with synchronous and asynchronous experiences. The use of WebXR platforms such as FrameVR has such a strong application in the education sector, especially in the response to the current COVID19 Pandemic. Students are able to access the platform easily during remote learning or whilst at school and this provides a consistent, low barrier entry platform that reduces the disruption brought about by periods of isolation. Innovation. As a school we promote the mantra of Innovation Wrapped in Tradition. This means we consistently look to review and refine the learning experiences of our students whilst still maintaining a strong vision and culture based on shared beliefs and values. We provide our students with inquiry-based learning units which purposefully use technology to deepened student understanding. We promote a growth mindset amongst the students and social learning theory to allow students to explore and apply themselves at a level appropriate to their stage of development.

2 Audience and Outcomes

1.1 Audience

K-12 educators who seek to design and implement a unit of work that aims to develop empathy in their students, enhance understanding of inclusivity and diverse perspectives share student learning through VR platforms, and enable student creativity using VR platforms.

1.2 Outcomes

The audience, students, and employers will have the opportunity to engage with authentic student learning via immersive platforms and gain professional development in use of VR platform for showcasing student learning. It will enable students to develop skills and experience with VR platform support students to share learning with a wider audience due to VR platform.

3 Educational Significance and Impact on Advances in the Field

The learning framework at Knox Prep has a future focus providing educational experiences relevant to our students' diverse lifestyles through engaging and personally relevant inquiry topics. We focus on developing a deep understanding of connected concepts rather than rote memorization of facts. As a school community we can use virtual environments to connect with our communities both local and globally. The school in recent years has a large community further abroad. This platform enables our boys to make connections with those they are unable to see on a regular basis and foster positive relationships with them. We

have also had student teams running workshops in extended reality spaces at global conferences throughout the last two years and the boys always provide such a rich and engaging range of perspectives, skills, and competencies beyond their years.

4 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 of 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).