Assignment One

Creating Preferred Futures

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for

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Virtual Reality is the computer-generated simulation in three dimensions of an environment that a user or multiple users can interact with using specialised hardware and software. Stereotypically, hardware consists of Virtual Reality goggles, however screens, when constructed to surround and immerse a user are also applicable. Other hardware used, but not limited to, are gloves, controllers, speakers or other audio equipment. Augmented Reality is similar to Virtual Reality however makes use of the user's surroundings by superimposing a digital image over the environment. Finally, Mixed Reality also superimposes a digital image onto the user's environment but also includes the use of physical objects in the virtual world. That is, objects that a user can interact with within the real world are also included in the virtual world, therefore blending the two environments together. (McMillan, et al., 2017). Extended Reality (XR) is the term used to encompass all three of these simulation environments together (Kaplan, et al., 2021)

The experiences that students will have the opportunity to experience, that they would otherwise not have, due to financial situation are extraordinary. Users are able to view environments that ordinarily are prohibited due to high costs of travel or requirements for specialised specific equipment. Whilst initial costs of the hardware and software for any XR platform is high and could be considered specialised equipment, it has significant versatility to explore various environments and conduct various functions. Whereas a single excursion to a unique location is both high cost and a one-time occurrence. (Kaplan, et al., 2021)

XR, at this point, does not replace the experiences that may be gained through authentic and hands on exposure. However, it would enable students a greater breadth of experiences of which would not cost the student anything to access, or in the least be significantly lower than the cost of repeated trips to unique locations.

XR and simulation-based training continues to develop as an effective, yet low-cost option for various organisations. For example, militaries around the world use computer

simulation to train combatants in high-risk environments that would otherwise be life-threatening. Also, pilots conduct numerous flight hours in simulation to augment practical training, reducing risk and cost. School and educators should not only be following in this trend to expose students in the use and function of XR but also in its development in the workplace and for future careers.

Potential opposition to introducing any kind of XR platform is the high initial cost, required training for staff and any required ongoing subscription and support costs. Whilst these costs and extra training requirements may be significant initially, this medium for training and to give people opportunities that they would not ordinarily by afforded, provides experiences that far outweigh the costs.

All learning styles can be catered for through the use of XR. Whilst, some preferred learning styles are likely to gain greater benefit through the experiential environment that XR provides, each learning style can be targeted through this tool. Further, the various types of learners exposed to VR when used in education are not hindered by a way of learning that does not preference their learning style. Rather through their genuine engagement they become a learner that the VR components fit with, as well as the type of learner that fits with the content that is being taught. (Wang, et al., 2015)

For students that are immersed in the curriculum, the opportunity to design user interfaces for people, specifically those with disabilities, in VR, allows them to fulfill the Australian Curriculum requirements in a meaningful and applicable way for the future workforce. Further, students can use existing VR programs and their elements, to explore how to manipulate them for reuse in similar or other application.

Current and potential future career and workplace applications are within building design and for conservation of natural environments and man-made structures. Some innovative building design firms are exploring the use of VR to allow a potential investor or

customer to explore the proposed product interactively. This allows those customers that are less capable to visualise technical drawings and how they could be applied in the real world. The application to conservation allows people to explore an environment that is inaccessible, due to risk damage to the area, to be able to explore and experience that ecosystem, without increasing the risk to its loss. Further, this can be used to further educate people on the risks to those ecosystems. Thus, raising awareness and potentially funds to support their restoration or protection. (Nelson, et al., 2020. Bednarz, et al., 2016)

The applications of XR continue across many facets of the curriculum. For example, the Royal Flying Doctor Service paired with an exhibit to place on display the bombing of Darwin. In part of this exhibit, there is a VR immersive experience where users can view the areas where Darwin was attacked and follow some of the stories of people that were involved (Royal Flying Doctor Service, n.d.). This facility allows users to "see, experience and learn through the wonder of technology as this facility brings history to life", showing how VR can have impactful and meaningful effects on facilitating people to learn about the history of the local area and significant events. As discussed above, the hardware is not limited to only this exhibit or application, unlike some of the other display pieces.

Due to the current high cost of most XR platforms, students are unlikely to be able to access this as a resource at home. However, there are alternatives to reduce the gap when students are unable to access the classroom or the XR devices. As most secondary school students are likely to have their own smartphone device, simple, cost-effective VR and AR device holders can make use of these commonly found devices as a suitable replacement for school-based equipment. This enables students to work through some of the content at their own pace, however, with some reduction in quality.

The breadth of application of XR in education and the wider community can almost be a negative asset, as the almost limitless choices may result in choice overload. However, with

careful planning and identification of key areas to address inequities within education or an area for the greatest gain, XR can be transformative for students' engagement with the content.

Part B Presentation - Extended Reality in Education

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