The Classroom of the Future

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1. ABSTRACT

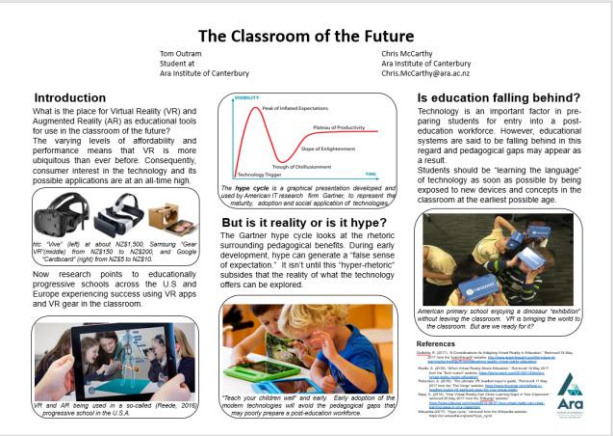
What is the place for Virtual Reality (VR) and Augmented Reality (AR) as educational tools for use in the classroom of the future? The varying levels of affordability and performance means that VR is more ubiquitous than ever before. Consequently, consumer interest in the technology and its possible applications are at an all-time high. Many developers have begun utilising VR outside of traditional realms like gaming or entertainment, into fields such as education. This poster aims to explore the application of VR in the classroom, and attempt to uncover a possibility of schools implementing this new and affordable technology in the classroom.

Keywords: Classroom, future, virtual reality, augmented reality

2. INTRODUCTION

The differences and similarities of VR and AR are outlined by McKalin, (2014), when he said that virtual reality is a system in which a user can interact with a virtually generated world - usually this is accomplished using a headset or goggles. Augmented reality involves the merging of virtual reality and real-life images or graphics so the virtual world is blended with the real world. This allows users to interact with virtual objects within their real-world surroundings. Although both concepts aim to immerse the user, the technologies achieve this in different ways. Users are still in touch with their surroundings when using AR, and their interactions are with virtual objects. VR however, completely immerses the user in the virtual world by isolating them from the real world.

Since Facebook's acquisition of "Oculus" in 2014, interest in virtual reality technology has sky-rocketed. Subsequently a myriad of different systems has emerged, offering various levels of performance and affordability. (Robertson, 2016) investigates the various platforms across their respective price ranges.



Now there are much more affordable options. Samsung's "Gear VR" has a cost of around NZ$200. This device involves coupling a smartphone with the device to create a VR experience. It utilises the phone's screen while providing a headset setup, a control system and a dedicated app store. Mid-range headsets include several low-cost models such as the Cygnet which sells at about NZ$40 to NZ$50. Lastly at the bottom of the price spectrum are solutions such as "Google Cardboard". This represent VR in its simplest form, combining a cardboard headset with a standard smartphone as the screen. These setups are often sold for as little as NZ$5. Consumers even have the option of ordering some cardboard and plastic lenses then printing a pattern from google. Now that these platforms have become mainstream, many are claiming benefits form their immersive experiences. Reede (2016) described growth in the market for educational VR technology with companies such as "Alchemy VR" and "Immersive VR Education" offering packaged curriculum and teacher training/support. According to Reede (2016) research points to educationally progressive schools across the U.S and Europe experiencing success using these 3D immersion and VR technologies in their classrooms. One such school is Sevenoaks in Kent, UK where according to Lawrie (2017) artificial reality is a tool for the classroom teacher of any subject, it gives the professional educator another avenue to explore with learners. It can be an effective new way to engage those that struggle, or it can just provide another opportunity to engage with a variety of learning styles.

3. LITERATURE REVIEW

Davis & Eicklemann (2014) discuss the co-evolution of education and digital technologies. They suggest that the two are linked and that changes in one tend to stimulate changes in the other. They point out that this co-evolution has very relevant implications for policy makers and practitioners. Gadelha (2017) also argues that education pedagogy must evolve to meet student's needs. He suggests that many educational systems are still applying old fashioned models of teaching. He asserts that post-education expectations for students to be workforce ready requires schools to shift toward a more technology focused curriculum. He believes that many students, particularly those with learning disabilities such as ADHD would greatly benefit from VR's engaging and immersive qualities.

Sapp (2015) argues the idea that educational systems have not caught up with advancements in technology. He contends that these disparities have resulted in pedagogical gaps in today's classrooms. These 'gaps' include issues such as shorter student attention spans. Sapp believes that gaming and simulation are effective at engaging students and improving focus. He also describes the idea that today's students are being taught

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information technologies using outdated methods such as text, often overlooking more relevant media such as video or immersive technologies.

Psotka (2013) suggests that the slower adoption of these devices isn't a result of their effectiveness. He believes the problem is that the technology cannot be effective until educational curriculum is changed to accommodate them. But if the curriculum will not change until the technologies prove effective, then no progress can be made.

Another emerging technology that is proving popular is Augmented reality. (Nesloney, 2013) outlines several ways AR can benefit education. Like VR, this technology allows students to interact with course content, further driving interest and engagement. Nesloney illustrates examples such as giving the students the ability to scan a page of homework to reveal a 3D clue or a video of the teacher that helps solve the problem. The University of Otago have applied this technology in a new learning tool (University of Otago, 2016). Their app allows students to see the 3D chemical structure of over the counter drugs using their smartphones. Dr Cridge of the university's pharmacology department says that this is essential information but traditional delivery of content can often be "dry" and difficult to absorb for many first-year students. The app however is an innovative way of engaging students. Dr Cridge expresses his excitement that the app utilises technology that students may already be familiar with from games or apps such as "Pokémon GO".

Bloxham (2013) identifies the fact that 71% of 16-24-year-olds own smartphones, which are often seen as learning distractions but could in fact be powerful educational tools. She proposes that AR has vast potential to enrich traditional educational media with digital content. She describes South Staffordshire College successfully implementing the technology in a brick laying course; "…improved the number of trainees cutting bricks right first time from 40% to a staggering 90%."

Gregory et al (2014) explores the use of virtual worlds such as "Second life" in real world classroom experiences. It discusses the idea of rhetoric surrounding a new technology versus the reality of its pedagogical benefits. Often during early development, the hype can generate a "false sense of expectation." It isn't until this "hyper-rhetoric" subsides that the reality of what the technology offers can be explored.

Iwaniuk (2017) points out that amongst the enormous hype for VR in the media, few people have commented on obvious issues. Problems like; motion sickness, discomfort, tech issues and the novelty factor fading away. Iwaniuk claims that these issues become very apparent after spending a significant amount of time with the devices. He predicts that this could result in a sharp drop in interest in the coming years.

4. ANALYSIS

Many researchers have acknowledged that technology is an important factor in preparing students for entry into a post-education workforce. Also, many seem to recognize the fact that educational systems are falling behind in this regard. Some researchers, such as Sapp (2015), go so far as to point out the pedagogical gaps that may appear as a result of these discrepancies. He acknowledged that mainstream implementation of the technology may be some time away but also stresses that students should be "learning the language" of technology as soon as possible by being exposed to these kinds of devices and concepts.

5. CONCLUSION

The importance of educational systems staying in touch with evolving technologies and concepts they introduce such as "learning the language" of technology is critical to a student's success in a post-education workforce. Many schools are already experiencing success implementing VR and AR into their curriculum such as "Sevenoaks" (Lawrie, 2017). Platforms such as "Google Expeditions" and "Nearpod" (Guadiosi, 2016) or the HP's AR "Aurasma" platform (Aurasma, 2016) have proven effective in increasing student interest and engagement.

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