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Personalised Learning. Diverse Goals. One Heart.

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Technologies in Tertiary Education

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Vision - A space for digital learning and exploring pedagogies: Virtual world education

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The Australian and New Zealand Virtual Worlds Working Group (VWWG) was established in 2009. Members of the group have written papers for ASCILITE conferences since 2010. Each paper's intention is to provide an overview on using virtual worlds in higher education, especially the practical aspects of incorporating 3D worlds to enhance student learning. This VWWG's paper looks at a virtual world as a space for digital learning and exploratory pedagogy – meaning, that the authors perhaps do not perceive virtual worlds as ordinary. However, they do acknowledge that those who do not regularly engage in virtual worlds may see it as new and innovative, perhaps even untested ground, but still with a degree of unfamiliarity. A survey was sent to the members of the VWWG in which the narratives have provided rich data for in depth understanding. The themes focused in the survey were 'disruptive thinking', 'emerging ideas' and 'lateral connections', from the perspective of the respondents' experiences in the implementation of virtual worlds in education. They discuss the idea of a virtual world used in education as a new treasure, or perhaps it has been in use for some time and now classified as traditional.

Keywords:

Virtual worlds, Second Life, disruption, emerging ideas, lateral connections

Introduction

The study is to investigate whether virtual worlds are a space for digital learning and exploring pedagogies. The paper discusses virtual worlds from the perspective of disruptive thinking, emerging ideas and lateral connections. A survey was sent out to The Australian and New Zealand Virtual Worlds Working Group (VWWG) community in which the 13 authors who responded provided rich data for further understanding current themes and issues. It is held that the respondents represent expert opinion. The paper was written by a team of researchers who had diverse backgrounds and viewpoints on the topic. What was found from the process is that it there still seems to be a perception that virtual worlds are untested grounds.

Context

The Australian and New Zealand Virtual Worlds Working Group (VWWG) was established in 2009 rapidly expanding to a steady membership of approximately 200 members. Since its establishment, the VWWG have conducted research and in which the results have been disseminated at conferences such as ASCILITE to provide

a longitudinal account of the members' experiences of using a virtual world in higher education. In this paper, we first provide an overview of past papers written by members of the VWWG, followed by an outline of this paper. In 2017, 18 members of the VWWG wrote a paper for ASCILITE looking at virtual worlds from the perspective of individuals, institutions and technology (Gregory et al., 2017). Twenty VWWG members presented the perspective of their students on innovation and design (Gregory et al., 2016). In 2015, 30 authors looked at critical perspectives of educational technologies (Gregory et al., 2015). In 2014, 32 authors discussed past, present and future uses of virtual worlds (Gregory et al., 2014). In 2013, 52 authors wrote a paper on remembering the past, understanding the present and imagining the future (Gregory et al., 2013). In 2012, 46 authors discussed sustaining the future through virtual worlds (Gregory et al., 2012). 2011 saw 47 authors exploring how virtual worlds were contributing to change through innovative teaching and learning (Gregory et al., 2011) and, in 2010, 21 authors outlined how virtual worlds were transforming the future (Gregory et al., 2010). There has been much insight and advice given via these papers, and it should serve to prove the path well marked.

Literature review

Online learning has become popular in higher education in Australia due to the advancements in technology, developments in the job market, and the geographic location of students (Murphy & Stewart, 2017; Xiaoxia & E-Ling, 2012). There is a different approach and set of skills required in online learning in contrast with face-to-face learning (Boling et al, 2017; Yamagata-Lynch, 2014). 'Digital natives' are "assumed to be more digitally adept and digitally attuned than previously was the case" (Henderson, Selwyn, Ashton, 2017, p. 1567). Factors for success in online learning comprise of socialising, support, interaction, flexibility and minimising technical difficulties (Schrum & Hong, 2002). The social side of university, including social networking, does have a positive impact for those learning online (Hamid, Waycott, Kurnia & Chang, 2015) through explorative pedagogy.

There are many uses of virtual worlds in learning and teaching in which the virtual world of Second Life is prevalent (Baker, Wentz, Woods, 2009). The virtual world has in some ways become an alternative way of learning and a viable option in learning and teaching spaces. Virtual worlds are seen as a new transformative and disruptive way in the teaching and learning context (Yee, Bailson, Urbanek, Chang & Mer-get, 2017).

Methodology

This is a mixed methods study using both quantitative and qualitative methodologies. A survey was sent out to academics working at universities in Australia and New Zealand who were members of the VWWG. The 17 questions of the survey were designed to acquire semi-structured responses as well as closed questions for statistical and thematic analysis. The survey was open for a fixed timeline, and the identities of the respondents were kept confidential. The main focus of the questions reported here were on disruptive thinking, emerging ideas and lateral connections. Through the analysis of the results, the authors discussed the notion that a virtual world is a new educational space, or, perhaps one that has been in use for some time and therefore an established space. The information was collated and reedited by the authors, forming a loose Delphi process. The qualitative method used for the study was through a thematic analysis. This was selected as it can identify, analyse, and code common themes from the data (Braun & Clarke, 2006; Rubin & Rubin, 1995). Narrative research analysis was also used to further explore their experiences in virtual worlds to represent this in a textual format. Rich data provided more detail and the complexities with working in the virtual world environment.

Results

Background of respondents

There were 13 respondents to the survey in which eleven were from Australia and two from New Zealand. Out of the 13 respondents, seven were from universities in capital cities, and six in regional centres. Four were also from institutes of technology. Due to the long distances between cities and towns, especially in Australia, virtual reality maybe regarded as a vital form of communication for those who otherwise would not be able to engage in learning.

Discipline areas taught

When members of the VWWG were asked to indicate the discipline they used virtual worlds for, the overwhelming response was in education with 57% (Figure 1). The other areas were in business (15%) and health, law, visual and performing arts and other with one respondent each of 7%. The response from law and visual and performing arts was from the same respondent. The high percentage of education respondents appears atypical of the active membership group of the VWWG.

One respondent described in detail the use of virtual worlds. They were not only used widely, but were seen as the norm:

In the past I used virtual worlds with foundation (bridging/enabling) students. I used virtual worlds with students from Level 2 to Level 4 (lowest foundation with little high school experience to certificate level) in cohorts from pre-degree nursing, teaching, engineering, social services, and trades. Currently, I am responsible for professional development and my students are lecturers. The work I do has a focus on elearning, tertiary teaching, embedding literacy and numeracy, and assessment and moderation.

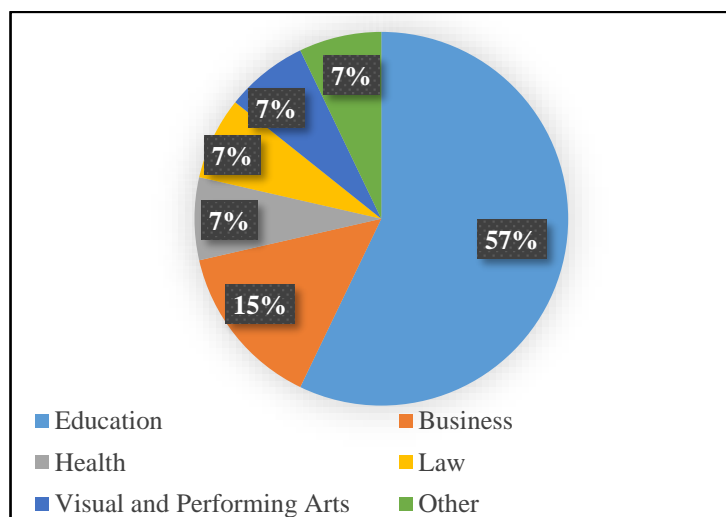


Figure 1: Discipline area where virtual world used

Another lecturer discussed how virtual worlds were used by students at all stages of their university experience: ‘Students, Initial Teacher Education undergraduate and postgraduate, master’s students studying educational technologies.’

Virtual worlds as a means for disruptive thinking

Members of the VWWG discussed a virtual world in terms of disruptive thinking. Virtual worlds, from the perspective of disruptive thinking, is how the world is transforming. They are transforming from being virtual to mixed and augmented. It is penetrating into health, business, logistics and teaching. In 2007, Hedberg and Freebody (p. 8) stated that while technology has been heavily invested in and implemented in the K-12 classroom “no such disruptive technological innovation seems yet to have challenged traditional pedagogies”.

Virtual worlds have the capacity to stimulate disruptive thinking in students by putting them in learning spaces that are unusual to them. By asking them to attend class in a virtual space embodied as an avatar, students report that everyone is so used to ‘chalk and talk’ or teachers writing notes then talking for long extended periods of time about them. This new wave of innovative pedagogies opens up the classroom environment to a wider world of communication for a school and particular students to engage with. The students mentioned ways in which virtual worlds could be used, such as: virtual stores could teach students about commerce in spaces where they can trade goods and services for real rewards. Virtual governments could teach students about civics and responsibility. Historical characters could be brought to life and scenes re-enacted. Theoretical mathematics could be given real applications in the virtual world. Virtual teaching could be practiced prior to going into the real world to teach.

As Jacka (2018, p. 29) states, “the introduction of an innovative technology, like virtual worlds, into the conservative environment of education can be challenging because it has the capacity to disrupt the status quo.” She went on to state that “the lessons that can be learnt from observing the patterns in the adoption of disruptive innovations is that they often at first appear to be of little value to current practices. It is not until the practices have changed in an almost synchronistic manner with the technology adoption that the type of use, usefulness, and ease of use of the technology emerge as an obvious and integrated part of society and/or education” , (p. 32). If we can disrupt the norm through digital innovation that in turn becomes a disruptive innovation, then we can hope to begin to see changes in the level of engagement that both teachers, faculty and students will have for collectively coming together in traditional spaces for learning.

By allowing students to form narratives and control their content and output, virtual worlds afford greater freedom than might be easily achieved in a classroom setting. It can allow a level of anonymity so students could assess themselves or interact in ways that bolster their self-esteem and social interaction. Virtual worlds can be used to support roleplay in a way that cannot be afforded in a classroom setting. This may allow for students to develop empathy with communities or population they may otherwise have no buy-in.

The weight of 'pedagogical' thinking and decisions are being heavily led by 'student satisfaction' scores leaving academics to play in a very safe zone far away from disruptive thinking. The concept of using an avatar in virtual worlds frees up one's identity and 'permits' disruptive thinking in an academic world which is increasingly regulated and controlled.

The traditional approach to the use of narrative is either short disconnected text-based problems discussed in tutorials and/or references in lectures or tutorials, to literature (such as the Merchant of Venice or Bleak House). Machinima created using virtual worlds disrupts that traditional model: it enables the creation of engaging, multi-layered and dynamic scenarios that are tailored to the material being taught and, for a generation of students who have typically grown up in a world surrounded by films and television, makes that material more accessible by enabling them to put faces to names in situations which they can readily identify. In this way it helps them to appreciate the relevance of what they are studying to real world practice.

Virtual worlds provide opportunities in teacher education to disrupt student thinking in relation to the classroom and school learning spaces, to practice pedagogical approaches in such spaces, to go beyond limitations of real world physical spaces, i.e., for students to build large objects impossible in real, or a space station (Boyd, & Ellis, 2013). In addition, it provides a disruptive perspective on/off-campus learning through virtual excursions to virtual spaces, static 3D images, and streamed or recorded 3D video spaces.

One VWWG respondent stated that their first entrance into virtual worlds, a decade ago, left them feeling a sense of extreme discomfort. It originated in a fear of the unknown or possibly even a sense of inadequacy. They refused to fail and challenged themselves to get to a point where they felt comfortable operating in the environment. Without that sense of discomfort, they would have missed the shift to disruptive thinking. Virtual worlds provide a constant push towards disruptive and creative thinking and this can be seen in the students as well as lecturers. Those who persevere enjoy the benefits of learning in a unique environment. The technical limitations become fewer and fewer as time goes by and the possibilities for the future are endless.

Virtual worlds in 2003 and 2019 are very different. As technology develops, so too does the potential for educational engagement in virtual world pedagogy. The technology is now easier to use and less fraught with potential technical glitches. Students are more receptive to working in a virtual environment as life around them gravitates more and more online. Lecturers see the software as less frightening and the learning curve is not as steep as it was in the past. Disruptive, creative, challenging thinking leads to change. Virtual worlds are not immune to this change. The changes are exciting for education. The possibility of engaging with real world objects, or address real world problems while immersed in a virtual world, hold great potential (Boyd, & Ellis, 2013). The use of mixed realities opens up potentialities for engrossing learning experiences. The traditional lectures will soon be relics from the past. Digital reality is the natural progression from virtual worlds, virtual reality (VR), augmented reality (AR), and mixed reality (MR). Digital reality will allow students to see precise demonstrations, participate in training with 'real' equipment, and engage in accurate workplace scenarios far earlier than currently possible.

The technical and social settings in virtual environments are constantly evolving, paving the way for new ideas and developments in education. The demand for more improved features will drive the need for research and development. The developments will also attract more users to 3D virtual spaces, creating a virtuous circle of learning and teaching. Virtual worlds provide spaces to encourage brain storming and the discussion of emerging ideas. They are a space for molding emerging ideas. Microsoft HoloLens and Oculus Rift are examples of how the virtual world is transforming the use of technology in various domains.

It seems that as an emerging idea, the technology of a virtual world itself, has not really progressed if we focus on virtual worlds such as Second Life. However, the development of other parts of the technology such as virtual reality and augmented reality that combine with virtual worlds and extend the idea seem to be moving us in a direction that will eventually show that adoption in education is as likely as in the area of entertainment. Having access to virtual worlds (and the extras; VR, AR) mean that we can experiment with ideas in a fairly 'low-fi' way. That is, we do not necessarily need a lot of money to put into place exploratory pedagogy and learning. This is what is exciting about virtual worlds, one can create the spaces they are imagining without employing a designer

or programmer. It opens up potential for teachers and students to do the same and to have a place to prototype various ideas in a simulation of the 'real world'. This way, we can test out 'emerging ideas'.

From the design and construction perspective, the use and accuracy of virtual worlds in building modelling begins to blur the lines between the virtual and the real world. Improved modelling capabilities that increase the accuracy and ability of the virtual world to 'replicate' the real world where not only does art imitate life, but art influences life. Virtual worlds provide spaces in which to integrate VR experiences and sandpit environments in which learners can engage with exploratory pedagogy – for example, design and construction, physical learning space creation and experimentation.

Lateral connections of virtual worlds

Virtual worlds have always had the capacity to create cross-disciplinary work. It can connect people from a range of disciplines and expertise which more easily enables lateral connections. For example, the use of the virtual world in design modelling has increasingly been merging architecture and drafting with cost engineering, or quantity surveying fields; as a social space in which lecturers, students and researchers come together and experience the same thing at the same time, and work together. It also lends itself to having collaborations in order to fully develop some of the more complex ideas researchers and lecturers are trying to investigate. In some ways it is found to flatten hierarchy. This may be because all are embodied as avatars and many come in with the same level of 'skills' in terms of navigation and building.

Building communities, as well as virtual artifacts, are highly significant and necessary in virtual worlds. Virtual environments can be seen in 3D versions of the popular social media sites. In an open world context, the student may form large social networks, however with the same constraints put on learning within a virtual world that is present in real life learning spaces, the student's ability to form these connections is retarded, thinking that constraints in real life learning spaces need to be reconsidered and the affordances of virtual worlds given space to develop.

Learning in a virtual world cannot occur in the traditional sense of gathering knowledge (e.g., accumulating facts). Learning within a virtual world incorporates 'things' lateral to the central act of knowledge gathering. This involves concepts such as collaboration, building relationships, problem solving, navigating and existing in not one but two worlds, i.e., through social presence. The nature of learning in a virtual world enables these lateral connections to flourish as learners who are unencumbered by their 'real self/real world' norms may have enhanced experiences and outcomes of learning.

Virtual worlds are bringing forth lateral connection by merging various fields and endangering a fusion of technology and business. A virtual world such as Second Life offers so much flexibility and possibility from a storytelling point of view that it enables even mundane study programs to be redesigned as vibrant learning experiences. It also facilitates the building of bridges not only between different parts of one subject but also between different subjects in a way not possible using traditional approaches. Virtual worlds often provide examples of the use of spaces and activities within virtual worlds, particularly as exemplars, that students and academics may not experience in the real world. i.e., approaches used in drama education for science educators and students.

Finally, an example of the importance of a collaborative group, such as the VWWG, was outlined by one respondent where they describe how they were first involved in a virtual world project, Second Life Education New Zealand (SLENZ) in 2009. They were an educator for the foundation (bridging/enabling) project. The respondent was impressed by the collaborative nature of education in Second Life. Later, this person joined the VWWG. This group of educators shared their projects, ideas, and research. For several years she has used Second Life for a role-play assessment for her pre-degree nursing students. The role-play 'patients', who also functioned as assessors, were their colleagues from the VWWG. Students would select a condition that affected a body system. They would research the condition and produce an informative leaflet/brochure for their patients. These would cover everything from breast cancer to diabetes. Her colleagues, members of the VWWG, would receive their leaflets/brochures in time to prepare for their timetables role-play(s). Student feedback from these assessments was very positive. The main thing they appreciated was meeting a 'real patient' and receiving feedback about their performance from someone other than their lecturer. One student response stated 'meeting someone new was great. My assessment report had lots of details and I knew what I had done right and what I could do better. It was fun and I learned a lot'.

Disruptive thinking, emerging ideas and lateral connections

The respondents of the survey discussed the three themes, disruptive thinking, emerging ideas and lateral connections from a view of a virtual world as an innovation and through student feedback. Following are responses from the VWWG members through the survey in relation to innovation. The survey asked how respondents are being innovative in their use of virtual worlds as a learning resource. Following this are some responses from students about how they felt about their experiences in using virtual worlds for learning.

Respondent feedback on innovation

As outlined, the respondents to the survey found virtual worlds in education not to be a new space but perhaps more of an untapped, unmined or even forgotten resource. Respondents discussed how they had been innovative in the virtual world space in which they taught/researched.

One respondent stated that they re-use and re-purpose the resources that exist currently in virtual worlds. An example was through the use of a foundation interviewing site in a virtual world which had been used for a nursing interview room for role-play assessments with pre-degree nursing students. Many of the respondents stated that they are prepared to try anything that will be of benefit to their students and assist them in disruptive, creative thinking and lifelong learning.

Several respondents state that they have plans to move their virtual world activities and games in a virtual reality activity, demonstrating the use of emerging ideas through the coding that would have to be undertaken for this to eventuate. This is particularly true of any of the virtual world games that have been used with students that lend themselves to this conversion.

One member of the VWWG community uses virtual worlds to create machinima, through lateral connections, which involves film making techniques and multiple stages of production. Video recording and recording of voice talent is undertaken separately, with video and audio synchronised in the editing process. In addition, the narratives depicted by machinima are linked by recurring characters and continuing storylines. This aids engagement because students are already familiar with the characters, their relationships with each other, and the context of those relationships. Machinima is used in a variety of ways in the various subjects, including to facilitate class discussions, summative class activities (e.g., negotiation role plays), to provide instruction, to provide feedback, and to contextualise otherwise abstract principles.

One second-year elective class is through a blended delivery as 50% of the course is delivered face-to-face in a lab, the other 50% is delivered virtually in Second Life. Both methods complement each other but can also 'feel' disjointed from the learner's point of view. The challenge was to bring theory and practice together through disruptive thinking. The learners are often paired-up to 'teach' each other. This concept is not new, and is considered to be an industry standard in software development referred to as 'pair programming'. Once the learners are paired up, one learner takes the role of the 'driver', and the other learner becomes the 'navigator'. The driver has control of the keyboard but strictly listens to the instructions from the navigator, who has to give instructions to follow but is not permitted to touch the keyboard. The aim of this practice is to encourage learners to become 'teachers' and cement their learning by teaching the other learner. This practice takes longer but encourages learners to justify their actions in using and building in virtual worlds.

Pre-service teachers were taken into the virtual world and asked to imagine how they can get their future classroom students to use virtual worlds to respond to the learning they were going to develop through emerging ideas. The pre-service teachers were asked to think about what types of technology they would use with their classroom students (K-12 classroom students). This often means that the pre-service teachers have to really change (and challenge) their thinking about what is possible, particularly when shown the work that eight-year-old classroom students have made.

Student feedback on their experiences in virtual worlds

All respondents of the survey stated that they regularly receive feedback from their students in relation to their experiences in using a virtual world for learning. Various quotes from different student groups follow.

In the pre-degree nursing role-play assessments, students stated that "It is a good experience. It gives me some ideas about what a real nurse is. It is also a good challenge. I feel more confident that I can be a nurse." This was reassuring for the lecturer to know that the students found their learning a challenge but the experience made them

more confident to put what they had learnt into practice. They stated that they liked communicating with their patient. Saying “I really enjoyed communicating and understanding the importance of the role as nurse. Nursing is my career because I love helping people”.

One comment depicts one of the major benefits of using a virtual world: “Today on our virtual ability visit in Second Life virtual world we had the chance of interacting virtually and asking questions after introducing ourselves. This opportunity to meet a very large virtual community of disabled residents has taught me many things. Second Life has given emotional and physical mobility to people who in the real world struggle with their disabilities. They enjoy each other’s company no matter their ages or impairment. They seem so close and loving even though they are separated by continents and cultures. I thoroughly enjoyed my session in their world”.

Further, another student from the same group, demonstrated disruptive thinking, by reiterating the previous response with “We visited virtual ability island where we had an opportunity to meet avatars from other countries. These avatars in real life are actually living with limited mobility and face challenges performing simple tasks that we take for granted such as sitting and walking. In Second Life they are able to be free of their disabilities and to meet as friends and equals. Their connection is intense and I couldn’t believe how close their friendships were”.

One respondent stated that a reason the virtual world community is quite effective is because it is very welcoming to people from all over the world belonging to different race, age group, ethnicity, culture and gender. People who may be visually impaired, have certain health conditions, and mentally or physically challenged, can also join this community which creates a positive and vibrant atmosphere for them. A student stated that “The continuity in storyline and characters ... was valuable because we didn’t have to focus as much on who was who and could instead concentrate on the issues.”

The students that one respondent spoke with overwhelmingly liked the experience of learning in Second Life. They agreed it provided a safe space to learn through scaffolded approaches where theoretical concepts were first tested in Second Life before going out on practical with real people. Figure 2 provides an example of a school practicum (professional experience) that was being undertaken in a role play with teacher and learner avatars. Learners also acknowledged that learning occurred through repetition and reflection - techniques that are used in real life learning.

Finally, one student summed up their experience with the following: “Thanks so much for setting this up - it was hilarious and a lot of fun, as well as being educational. Really appreciate this opportunity”. Many learners throughout Australia and New Zealand have been provided with similar opportunities over the past 10+ years and each respondent would have very similar stories to share.



Figure 2: Demonstration of a virtual class being undertaken with teacher/student avatars

Conclusions

Despite such hurdles, virtual worlds continue to demonstrate an experience that is difficult, impossible, or even too expensive, to replicate in real life. The main question of whether a virtual world is a new space for digital learning experiences can be answered quite easily. It is mostly definitely a space that is valued by many educators,

researchers and students who have had the privilege of experiencing the use of a virtual world in teaching, research and learning. The authors of the VWWG formed in 2009, ten years ago. They formed when virtual worlds in education had been undertaken for some time (for example, Second Life, was established in 2003). Therefore, in terms of technology, virtual worlds are definitely not new. In terms of a new space and pedagogy, the members of the VWWG would all agree that virtual worlds are as they provide a way in which to teach, learn and research in ways that are simply impossible in real life. They also provide a space in which to replicate real life to take away barriers that prevent the teaching, learning and research that inhibit this – be it cost, time, safety or a multitude of factors.

The authors have discussed their perspective of virtual worlds from three different angles: disruptive thinking, emerging ideas and lateral connections. From the authors perspective, virtual worlds are a tool in which educators, researchers and students can use in almost any context to provide experiences and a definitive answer to the question of whether or not virtual worlds are a space for digital learning and exploration of pedagogies – they most definitely are, they are just not new.

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