



## Building bridges for non-engineers: virtual world support for project based delivery

**Merle Hearn**

School of Foundation Studies  
Manukau Institute of Technology

For the past decade, educators have participated in virtual world teaching. Manukau Institute of Technology entered the virtual world of Second Life in 2009. Since then foundation or bridging students have repeatedly demonstrated skill development and knowledge acquisition through the utilization of virtual world resources. A change in the way the foundation curriculum is delivered has taken place over the last two and a half years with a switch to project-based delivery. A Virtual World Club was started to support students in their project work. Over the past year, the club has attracted attention from students and lecturers that has led to a more widespread adoption of the use of virtual worlds. Plans are underway to bring MIT students into alternative worlds, and recent technical advances will be an integral part of the direction MIT will take in future years.

Keywords: virtual worlds, Second Life, foundation, bridging, enabling education, project-based delivery

### Introduction

Manukau Institute of Technology (MIT) in South Auckland, New Zealand, entered the field of virtual world teaching in 2009. The entry point was with the Second Life Education New Zealand (SLENZ) foundation project (Hearn & Kelly, 2009). The value of virtual world teaching and training was shown in a significant improvement in real life interview assessments following training in the virtual world of Second Life (Hearn, 2012). In 2010, MIT School of Foundation Studies changed to a project-based system of curriculum delivery. The use of virtual worlds continued. A Virtual World Club commenced in Semester 2, 2012, to provide support for students in their class projects. The work done in the VWC has encouraged an increased use of virtual world resources.

This report will outline the past, present, and future use of virtual worlds for education, then examine foundation or bridging education and how virtual worlds can be used to support project-based delivery in a foundation studies or bridging programme. The activities and influence of the Virtual World Club will be examined together with a brief look into the future of virtual world education at MIT.

### Virtual worlds – past, present and future

Virtual worlds are 3D environments that share common features: they are persistent, immersive, and scalable. A virtual world is populated with multiple simultaneous participants who are social beings and can communicate with each other through text or voice chat. Participants represent themselves as avatars in the virtual space. “Avatar” comes from the Sanskrit word for “a form of self” and is a computer user’s self-representation or alter ego (Papp, 2010). Bartle (2004) characterized virtual worlds as “places where the imaginary meets the real” indicating the balance that designers try to achieve between reality and fantasy in the virtual environment. Virtual worlds have also been referred to as Multi User Virtual Environments (MUEs) or Massively

## Multiplayer Virtual Worlds (MMVWs).

For many years Second Life (SL), developed by Linden Labs and launched on June 23, 2003, was the main virtual world used by educators. The enthusiasm for the use of virtual worlds, and SL in particular, reached its peak from 2007 to 2009. By 2009, there were hundreds of leading universities and institutions around the world using Second Life as a part of their educational programs (Virtual Environments Enable New Models of Learning, 2009, para. 1). Following the decision of Linden Labs to abandon discounts for educators, there was a movement out of Second Life and into OpenSim and other alternative platforms.

The numbers of virtual worlds is still growing steadily, as the range in types of virtual worlds also increases. Recent trends indicate that accessibility to virtual worlds will accelerate in the future with technology such as sim-on-a-stick (Hax, 2012; 2013) web-based html5 with a canvas element that enables 3D (Hax, 2010; Paul, 2010), and virtual world mobile apps for smart phones and iPad (Taylor, 2011; Trier, 2013; ProtonMedia, 2013). Hundreds of publicly accessible virtual worlds exist (ArianeB, 2011) and companies such as Forterra Systems build many private worlds for businesses and the military. In a recent survey (Gregory et al., 2013), 32 Virtual Worlds Working Group (VWWG) educators from 18 Australian and New Zealand universities and technical institutes, reported that SL remains the most common virtual world in use (88%). However, only a few institutions (27%) rely on SL alone.

## Foundation education and project-based delivery

Foundation education, also referred to as bridging or enabling education, is aimed at students who have a strong desire to pathway into tertiary education but do not have the prerequisite skills or knowledge. Middleton (2003) stated that the aim of foundation education is to enable students to achieve success in learning and success in life.

Manukau Institute of Technology (MIT) is situated in South Auckland and runs one of the largest foundation departments in New Zealand (over 500 students). MIT foundation students represent over 60 different countries of origin, with approximately 40% from the Pacific Islands, 20% indigenous Māori, 15% Indian, 15% NZ European and 10% from a variety of other areas (SMS Records, Semester 1, 2013). Many foundation students have a history of social, emotional, financial, and literacy problems. Some do not have English as their first language. Many faced failure and rejection at school as the traditional classroom setting did not suit their specific learning styles.

MIT foundation students have had exposure to Second Life since 2009. Foundation students were motivated and engaged in interviewing training in SL and achieved results that indicated the skills they learned were successfully transferred to a real life interview environment (Hearns, 2012). A cohort of Māori pre-degree nurses participated in literacy activities in Second Life, and showed improvements in writing and digital literacy (Hearns, 2011).

The positive results obtained by MIT foundation students in SL can be attributed in part to the relative safety felt in the virtual world environment and the increased motivation to participate that resulted from a sense of presence (Hearns, 2012). “We exist in physical reality. We live in physical reality and sometimes we “live” in virtual reality. Although our biological needs cannot be satisfied through virtual reality, our emotional needs can be” (McKinney, Shao & Shao, 2011, p. 161). Emotional closeness through shared experience and a sense of immediacy arises out of interaction in virtual worlds (Salt, Atkins & Blackall, 2008.) The sense of shared experience is particularly significant for foundation students and Māori and Pasifika students in particular. The use of virtual worlds at MIT has continued despite a change in curriculum delivery. For over two years (2010-the present) the School of Foundation Studies at Manukau Institute of Technology has adopted a project-based method of curriculum delivery. Although focused on the production of an end project, the method could be labelled ‘theme-based’ as there are many components to each project, all centred on the same theme. Literacy, numeracy, and science are all embedded into project content.

Russ, Richardson, Lowther, and Taituha (2011) mentioned that a firm foundation for learning was provided by facilitating personal responsibility and actively engaging students in seeking meaning and understanding, and that was true regardless of students’ ethnic backgrounds. The current teaching methodology used by MIT’s School of Foundation Studies attempts to reflect the values of Māori and Pasifika cultures. This is done by being aware of the needs of Māori and Pasifika students; ensuring learning is engaging and relevant; and adopting a holistic approach that builds personal management and behavioural competencies as well as skill and concept mastery (Russ et al., 2011).

Preuss (2002) discussed the benefits of a project-based method of teaching. These benefits centre on connections. Students establish connections by working in groups or teams, sharing ideas, recognising the validity of the opinions and perspectives of others, accepting personal responsibility for learning, and taking pride in accomplishments. Howell and Mordid (2003) also mentioned the feeling of self-worth when students were able to see a concrete end project as the result of their learning journey. They stated, “When a student actually enjoys the process of learning, the learning takes care of itself. That’s one of the benefits of the project approach” (p. 34).

The current MIT Foundation programme is focused on learning how to learn. Adult learners are encouraged to contribute their understanding based on life experience and this provides a richer learning climate for other students in the project groups. The sustainability of students’ learning is encouraged as students develop skills that are transferable. Sharma (2010) suggested that the “education of today might be obsolete tomorrow in a technologically driven social environment” (p. 103). She suggested that one of the approaches that will “prepare the learner for creative adaptability to address the challenges an evolving society may present in an imaginative future” (p. 103) is project-based delivery (together with practice-based, place-based, and industry-based learning). The aim of the new programme delivery at MIT Foundation Studies is to equip students with the skills they will need to be prepared for a journey of learning, following their career pathways and beyond. Wright and Overton (2012) stated that an affiliated goal of this delivery shift has been to develop students’ technological awareness.

To assist students in their projects and to help them develop their technological literacy, a Virtual Worlds Club was initiated at MIT, starting in Semester 2, 2012. Last semester the club ran only one day a week after class on a Tuesday. In Semester 1, 2013, the club ran after class on a Monday, and during the lunch hour every Thursday. In Semester 2, 2013, the club is scheduled to continue as per Semester 1. Attendance at club sessions is completely voluntary. The activities for the week support the work in class.

The Virtual World Club has increased enthusiasm for the use of virtual worlds from both students and other staff. As a direct result of the work done in the VWC, there has been an increase in the use of virtual worlds for project support in normal class time.

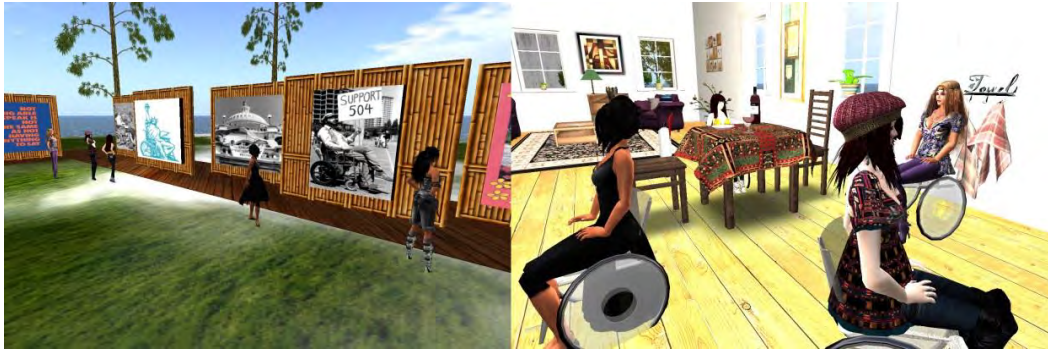
### **The Virtual World Club (VWC) and beyond**

In Level 2 Foundation Studies all cohorts run the same projects. At Level 3, projects differ from cohort to cohort (the cohorts for 2002 were Health, Social Sciences, Business, and Engineering; and in 2013 Business was combined with Social Sciences). In Semester 2, 2012, the students who attended the VWC were from both Levels 2 and 3 of the foundation programme. As it was difficult to cater for the needs of the different levels who were engaged in different projects, VWC sessions were split into Levels, and alternate sessions run for Level 2 and Level 3. The only attenders from Level 3 were from the Health cohort (pre-degree nurses). In Semester 1, 2013, all participants were from Level 3 Health.

The following table illustrates some of the projects at Level 2 and Level 3, and a sample of the VWC activities that took place.

Level 2 Projects	SL Activities		Level 3 Health Projects	SL Activities
Our Journey - focusing on the students as individuals & their study pathways	Personalising my avatar -how can I show who I really am?		A future in healthcare -biological me plus health care providers	Health Information Island -worksheets & meet the professionals
Cult Couture -designing a garment from recyclable or natural material	Fashion design in SL -creating an outfit from full perm clothing for a competition		Infection -understanding infection & its control	Genome Island -investigating cells, including viral cells & bacteria
MITE Chef -creating a healthy snack	Ohio University Nutrition Game		Nutrition & Mobility -what we need & what happens when things go wrong?	Virtual Ability Island & wheelchair house, Danish Visions sim
Water -why do we need water?	Centre for Water Studies -guest lecturer Jack Buxbaum, followed by a trip to the CWS sim		Holistic Wellbeing -an ideal treatment environment for a health condition	Te Wāhi Whānau -an ideal birthing unit

**Figure 1: Selection of projects & activities in SL**



**Figure 2: VWC students on Virtual Ability Island (left) & in the Danish Visions wheelchair house**

The Virtual World Club has increased enthusiasm for the use of virtual worlds from both students and other staff. As a direct result of the work done in the VWC, there has been an increase in the use of virtual worlds for project support in normal class time. Several health classes have participated in information-gathering interviews in the holistic wellbeing project; the pre-degree engineering cohort have entered SL to visit the Areva Nuclear Power Plant, the Ellinogermaniki agogi virtual portal to see the Virtual Atlas Project and to the Etopia EcoCommunity; and, as from Semester 2, 2013, all Level 4 BioScience students will participate in research on Genome Island.

#### **The Virtual World Club (VWC) Student Feedback**

Although 20 students actively participated in the VWC, only four students in Semester 2, 2012 and three students in Semester 1, 2013 were regular attenders. These students were asked to reflect on the experience of attending the club and whether they had benefitted in terms of the work they were doing on their projects. Students completed a Blackboard Survey which consisted of eight Likert scale questions, phrased both positively and negatively (the scale consisted of Strongly Agree, Agree, Partially Agree, Partially Disagree, Disagree, and Strongly Disagree). The data was automatically summarised by Blackboard and student comments remained anonymous.



**Figure 4: Health students preparing for their interviews (left) & engineering students touring the Areva NuclearPower Plant**

Students were unanimous in agreeing (or strongly agreeing) that activities in SL were a positive experience, that they had learned new skills in SL, and that the knowledge they gained in SL helped them complete their projects. They were also unanimous in disagreeing that the time spent in SL was a waste of time, and that they could not apply their skills to their project work (with one partially disagreeing). Students were not quite as positive about it being easy to do research in SL, with three only partially agreeing. When asked if they felt they were really present in the SL environment, six strongly agreed and one partially agreed. Two students partially agreed with the statement that they did not feel connected to their avatars, three partially disagreed, one disagreed and one strongly disagreed. It is interesting to note that the students who did not feel connected to their avatars did not attend the session where students personalized their avatars.

Students were asked to record the best thing about their SL experience. A common thread was that it was interesting, colourful, fun, and “better than the textbook” (Student 3). One student specifically mentioned the cell exploration on Genome Island, and one mentioned the ability to solve problems in a real setting. Student 14 had this comment to make, “I highly recommend using SL for whatever subject a student may be studying towards. Awesome idea and love the concept of it.”

Students were asked about the things they did not like. The majority dealt with technical issues of lagging and crashing, although these proved to be only minor problems.

The last question dealt with suggested improvements. Four students suggested more time and the opportunity to take students from the same cohorts or pods as a group into SL. A suggestion was also made to provide “activity cards” so that students could meet out of class and VWC time, and get together with their classmates and friends when they had time to spare.

## Conclusion

Students engaged in the VWC, were enthusiastic about their activities, challenges and trips, and the feedback they gave suggested the club was a worthwhile addition and support to their project work. In the words of one club participant, “We should have the club in class, not in our own time. It’s fun in SL. I like working and having fun at the same time” (Student 5). The use of SL at MIT in the past was effective and produced excellent results. It is currently engaging students and enhancing their project work. In the next semester, the VWC will continue and more classes will be entering virtual worlds. Apart from the Level 3 health classes using SL for information gathering interviews, students will be meeting disabled residents of Virtual Ability Island in the mobility project. A literacy game, currently being built on Kately, will be tested with two classes of the pre-degree nursing cohort.

Virtual world use has accelerated at MIT and students have benefitted from the addition of learning activities in virtual worlds. At least within the near future, MIT will continue to use existing resources and develop new activities to challenge and motivate students to enjoy their learning journeys.

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**Author contact details:**

Merle Hearn, [Merle.Hearn@manukau.ac.nz](mailto:Merle.Hearn@manukau.ac.nz)

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