



He ara hou ka tū mai: NZ institutions of higher learning unpacking demands and facilitating change

Merle Hearn
Manukau Institute of Technology

Judy Cockeram
University of Auckland

Gareth Schott
Waikato University

Tim Bell
University of Canterbury

Todd Cochrane
Wellington Institute of Technology

Deborah Corder
Auckland University of Technology

Anne Philpott
Auckland University of
Technology

Clare Atkins
Nelson Marlborough Polytechnic

Scott Diener
University of Auckland

David Parsons
Massey University

Garry Falloon
Waikato University

Mick Grimley
University of Canterbury

Niki Davis
University of Canterbury

Alice U-Mackey
Auckland University of
Technology

Roy Davies
Auckland University of
Technology

Sue Gregory
University of New England

Michelle Honey
University of Auckland

Erik Champion
Massey University,

David Thompson
University of Canterbury

Richard Green
University of Canterbury

Donna Morrow
University of Canterbury

Tony Clear
Auckland University of
Technology

Swee Kin Loke
University of Otago

The Virtual Worlds Working Group began with the DEHub research consortium in November 2009. In December 2010, New Zealand joined the VWWG. This paper highlights the current work of the NZ based members of the group and presents the work of 23 authors at 11 institutes of higher education in New Zealand. The scope of the work covered is diverse, and a number of platforms have been used. Virtual worlds enable educators to provide realistic simulations, engaging role-plays, immersive and genuine tasks, and social interaction that encourages group collaboration, and highlights the ability that virtual worlds have to transform both teaching and learning.

Keywords: virtual worlds, *Second Life*, *Reaction Grid*, *OpenSim*, immersion, engagement, VWWG

Introduction

He ara hou ka tū mai means “A new pathway before (us)”. This Māori phrase succinctly summarises the position in which NZ educational institutions find themselves. As digital literacy continues to increase in importance as a key skill in every discipline and profession (New Media Consortium and EDUCAUSE Learning Initiative, 2011, p. 3), so the demands of our students and the demands of education precipitate us along this new pathway into virtual worlds.

“Virtual worlds are richly immersive and highly scalable 3D environments. People enter these worlds via an avatar which is their representation in that space”. (New Media Consortium and EDUCAUSE Learning Initiative, 2007, p. 18) Virtual worlds offer educators a graphically rich, immersive and engaging environment where students can engage in role-plays, simulations, data visualization and modelling.

Salt, Atkins and Blackall (2008) described the sense of shared experience, immediacy, and the resulting social and emotional sharing, which facilitate group and collaborative learning in *Second Life* (SL), a virtual world used extensively by educators. In the EDUCAUSE Review, Marina Bers suggested that there is a change and shift in education from the idea that knowledge exists in an individual to a community of learning and this change can be seen in virtual world education. This spirit of educational collaboration led to the birth of the Virtual Worlds Working Group (VWWG).

In November 2009 the VWWG was formed from the initial institutions that comprised the DEHub research consortium: University of New England, Charles Sturt University, Central Queensland University, University of Southern Queensland and Massey University. Other Australian institutions were invited to join and by July 2010, the membership had increased to 22 members. On 7 December 2010, NZ joined the VWWG. Currently the total membership of the VWWG stands at over 150, with New Zealand having 31 members from 16 institutions. Membership is diverse, including lecturers, researchers, technicians, developers and administrators. Members contribute a wealth of expertise in various fields of endeavour, and assist each other in research initiatives, shared classroom experiences, presentations and publication.

This paper outlines the use of virtual worlds in many New Zealand institutions. The examples represent a diversity of research, experience, and perspectives. But the common element is the belief in the efficacy of virtual worlds for education and their potential for meeting the changing demands of a digitally challenging world. Virtual worlds have enabled the provision of resources, experiences, and learning that would have been difficult and sometimes even impossible to provide in the traditional classroom environment.

New Zealand Institution Vignettes

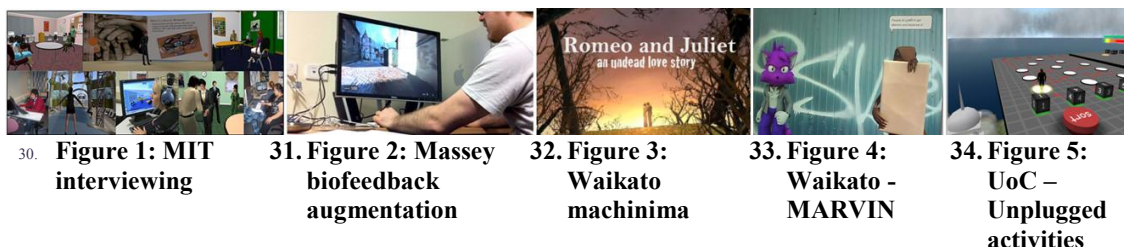
The following table summaries the current work being done in virtual world education by a number of New Zealand institutes of higher learning. Educational demands in New Zealand are changing rapidly and this table suggests ways that institutions are changing directions in response to these demands.

Institution -Where	Project Intent	Process	Outcome	Future plans
MIT <i>Purpose built sim: Kowhai on SL Movement into Jokaydia Grid & NZVWG</i>	Student interview skills for Foundation students Career pathways	Interview aspects, dress, simulated interviews in purpose built rooms (as shown in Fig 1)	Engaged students, retained students, more merit passes	Use by other departments Literacy game
University of Auckland – Health <i>Purpose built health clinic: SL</i>	Simulation for undergraduate nursing students	Simulation involving three active student nurses with patient and family member, plus other students observing	Thoroughly engaged students Debrief ensured learning of key points.	Have used the setting for other simulations Waiting for faster broadband before exploring extending further
University of Auckland – Architecture <i>Purpose built sim: Putahi on SL</i>	Give studio based experience to acquire digital skills in a virtual urban-like building site called the Living Sketchbook	Creative Digital Studio space for the first imaginative steps needed to design and build architecture	To ‘get over the interface’ and arrangement of the complex information flows of image and building design and construction	Ongoing survival and acceptance of virtual worlds/3d web rather than “SL” Continue development of the Living Sketchbook
Massey University <i>Customised Open Wonderland world hosted on university server</i>	Create a virtual workshop for teaching agile software development methods	Run workshops, observe and interview participants	Useful feedback for future design iterations	Benchmark performance and utility against other open source virtual worlds
Massey University – Auckland School of Design <i>Biofeedback augmentation, (Fig 2) Blender, Unity & Flash in lab & online</i>	Adapting interfaces for virtual world use (Champion & Decker, 2010)	1. Biofeedback sockets to augment gameplay 2. Combining mirror and code 3. Chinese character sketching 4. Unity run inside Moodle	1. Utilised in architecture 2. Projection of virtual environs 3. For learning Chinese 4. Running a virtual world inside an LMS	Extending work in creative interfaces
Waikato – School of Arts <i>Garry’s Mod, a modding application for Half-Life 2 & its associated community and wiki</i>	Transferability of learning from creative practice, the role of machinima as a filmmaking tool, and mode of engagement with gaming technology	Workshops, utilising regularly updated user-generated content and solution based engagement to realise a film concept	Short film as a creative output (Fig. 3 as an example) Further knowledge of game engines and modding practices	Consolidate and shift modding environments into purpose built open-source machinima applications
Waikato – Education Faculty <i>Intermediate schools in the Hamilton region – MARVIN (Fig. 4)</i>	Classroom-based research exploring using avatars to help develop student key competencies	Interviews, observation, screen capture software, video	Higher order thinking skill development. Increased collaboration. Enhanced awareness of local issues	Extend research to other school levels

University of Canterbury – Computer Science Education <i>On OpenSim portable server for use within schools</i>	Using virtual worlds to evaluate and deliver CS Unplugged activities (<i>Fig 5</i>)	School students participate in activities and their actions are captured for analysis	Experimental system still being developed for monitoring activity in SL	Complete experiments and see if evaluation in SL can inform evaluations in the physical world
University of Canterbury – Literacies & Arts in Education <i>OpenSim Server on campus – nominally part of NZVWG</i>	How to use MUVES effectively in vocational education contexts	A MUVE for temporary traffic management instruction is being developed through design based research	This partially developed scenario is part of an on-going research project	On going research
Wellington Polytechnic <i>SL – Koru Kowhai Island</i> <i>OpenSim Server on campus – nominally part of NZVWG</i>	Authentic learning of technology & architecture Exploring dance, human senses and technology Using the virtual environment as a development tool	Computer Architecture course Dance - digital sensing of human data Designing prototype environments	On going achievement of learning outcomes Performance at Digital Resources for Humanities and Arts 2011, and on going collaboration	Continuing current projects Continuing collaboration on an international level
Auckland University of Technology– Languages <i>Purpose built sim: Kowhai on SL & exploration of cultural sims throughout SL</i>	Undergraduate: Experiential intercultural learning and language learning Postgraduate: virtual worlds for language learning, teaching and research	Undergraduate: ethnographic studies in a range of cultural sims Postgraduate: enquiry based learning; development of core knowledge	Undergraduate: critical awareness of own identity and culture; effective communication for relationships, Postgraduate: educational potential of virtual environments	Undergraduate: Develop exchanges with other universities Interdisciplinary studio model Postgraduate: possibly integrate into other courses
AUT - Computing & Mathematics <i>1) Prototype Java 3D CVE 'Tealink'</i> <i>2) UpStage an open source web-based platform for cyberformance</i> <i>(http://upstage.org.nz/blog/)</i>	Aid learning and research into global virtual teams and collaborative technologies	1. Global virtual collaboration – ongoing development 2. Undergraduate projects working in partnership with the UPStage Virtual organization to extend UpStage software	1. Challenging learning experiences in CVE development, and collaborative technologies 2) Intriguing learning experiences, including open source development	1. Possible porting to a browser based technology stack - new global collaborations 2. Continuing developments and enhancements for annual performance festivals
Auckland University of Technology– VR Suite <i>AUT VRSuite, Colab</i> <i>http://vr.colab.org.nz/</i>	More effective VR research by sharing of resources and expertise An interface to aid industry in undertaking 'research of value' in interactive 3D	Exploration of varied 3D applications in a number of contexts such as rehab, advertising, interactive art, etc Complex data visualisations of natural disasters	Enjoyable learning experiences, clever algorithms and visualisations, useful research outcomes linking 3D technology and contexts	Industry linked research -human full-sensory perception and interrogation of complex information driving complex processing and modelling

University of Otago <i>Otago Virtual Hospital (OpenSim)</i>	Professional identity development of medical students	Medical students solve clinical cases while role-playing as junior doctors in virtual emergency department	To solve clinical case, students needed to notice clinically salient elements by themselves (Blyth, Loke, & Swan, 2010)	Assessment of dispositional behaviours as a measure of professional identity
Nelson Marlborough Polytechnic – IT <i>Koru and Kowhai in Second Life, Korako on JokaydiaGrid, NMIT sim on NZVWG, Sim on a stick Kitely</i>	1. How to build and script virtually, create communities of practice, and create machinima 2. Studying Systems Development Methodologies	1. Investigate viewers and grids, taught in SL how to build and script Final assignment built in chosen environment 2. Design & build a complex virtual world build	1. Understand the purpose and affordances of virtual worlds 2. Complex development process using established methodologies and adapting and innovating where necessary	More of the same. Keeping abreast of this technology and its implications (e.g. 3D web sites etc) is essential for future IT professionals
NMIT – Languages <i>As above</i>	Students learning English (at NMIT)	Early stages - using NZ themed immersive space for conversation	More comfortable role-playing and trying new skills as an avatar	Provide ‘authentic’ spaces for language learning

Table 1: Current work being done in virtual worlds by some VWWWG NZ institutions



Themes

Several themes emerge in the work of the institutions reported in Table 1. These include the following:

The students who are working in virtual worlds demonstrate a high level of immersion in the tasks they are challenged to complete. MIT report that students involved in the SLENZ (Second Life Education NZ) Project reported a sense of immersion which was supported by anecdotal evidence (Winter, 2010) and this immersion was reported in SL classes subsequently. Waikato Faculty of Education describe improvements in student social interaction, and the increased involvement of ‘peripheral’ students in general classroom activities.

A common theme in the majority of the vignettes in this report is that what is impossible for students in the real world, becomes possible in the virtual world. Making the impossible, possible, is often associated with simulation builds. The University of Auckland has simulations for maternal haemorrhage, paediatric bereavement, nursing and pharmacy and the University of Otago has a virtual hospital in which medical students

play the role of junior doctors/housemen. Students are provided with safe and authentic learning experiences.

The ability to provide the previously impossible is also indicated in many Arts courses, eg. the architecture students from the University of Auckland, Computer Science students at Canterbury University, WelTec, and NMIT are all able to pursue projects made possible by virtual worlds. Language tutors report this same advantage of virtual worlds. Japanese students at AUT are able to go to the Japanese sim (virtual build) to interact with native Japanese speakers for an engaging and very real experience. It is possible for these students to not only engage in the previously impossible, but build networks and establish a sense of community at the same time.

The sense of community is another main theme indicated by the work of these NZ educators. There is group connectivity between educators and students in virtual worlds. This is seen in the VWWG itself where collaboration and community is seen in the huge growth of participating institutions. Links are reported between architecture students at Auckland University and Technology students at WelTec and between WelTec students and NMIT students. Several projects reported in Table 1 are part of international collaborations, eg. WelTec with dance instructors and students in Portugal and Japan, and AUT 'Teamlink', a global collaboration including NZ and Sweden. The sense of community is vital for students in the performing arts, with AUT students involved in UPStage relying on an online audience that participates via a browser, and the machinima (derived from machine and cinema) produced by arts students from Waikato Student is exhibited publicly online (e.g. www.selectparks.net, www.machinima.com).

Designing creative software solutions is another theme that is evident in the work reported in Table 1. Examples of this work include many of the IT courses, eg. Massey University examining techniques of agile software development in a game based activity, Massey's Auckland School of Design researching interfaces that can be adapted for virtual worlds, WelTec using virtual worlds as a development tool for creating prototype 3D interactive environments, the AUT Faculty of Design and Creative Technology's continuing investigation of 'Teamlink', a prototype Java 3D CVE, developed to aid research into global virtual teams and collaborative technologies, AUT's VRSuite, CoLab examining the use of interactive 3D technologies to aid industry, and NMIT where students are creating applications in complex immersive MUVES as well as gaining an understanding and appreciation of the communities, the potential benefits and issues of working and operating in these environments.

Higher level critical thinking and reasoning skills can be developed within virtual worlds, as indicated by the work in creative software solutions. Real-time problem-solving is a common theme in virtual world education. Virtual environments that contain game elements frequently rely on real time problem solving. MIT's proposed literacy game will challenge students to solve grammatical problems. MARVIN, utilized by the Waikato University Faculty of Education, when used in small group settings, supports discussion, debate, critique, organisation and presentation of researched information through the exercise of higher order cognition (analysis, evaluation, creation) (Falloon, 2010). The prototype traffic management scenario being tested by the University of Canterbury requires surveyors to produce a traffic management plan for when they are working on a road.

It is also important to note that a number of tertiary institutions working in virtual worlds are working in conjunction with other sectors. Waikato University Faculty of Education has used MARVIN in trials with two Intermediate schools (Years 7/8) in Hamilton. The trials have concentrated on identifying any role the application might have for supporting the development of selected key competencies as outlined in the revised New Zealand Curriculum (2007). The Computer Science Education group at the University of Canterbury is

interested in using virtual worlds to collect information about how learners interact with educational material. The main focus of the group is the CS Unplugged project (csunplugged.org) which exposes students to advanced concepts in Computer Science without using computers. Prototype Unplugged activities built in virtual worlds are on a local server as they are designed for the use of primary school children.

Conclusion

Virtual worlds are being used in New Zealand institutions of higher learning. Although Second Life still plays an important role in education, educators are looking into alternatives. The NZVWG is an OpenSim platform that is NZ based and has an academic focus. It operates on servers hosted by Auckland, Otago and Canterbury Universities, and Wellington Polytechnic. NZ educators are using a variety of other virtual worlds and challenging their students to use and create unique 3D interactive environments.

At *ascilite2009*, Scott Diener from The University of Auckland made the comment that everything in education would change with the use of virtual worlds. "They provide a real sense of self and the suspension of disbelief, a sense of place and sense of emotion." (Diener as cited by Waugh, 2009). These qualities of virtual worlds allow students to become immersed in active, problem-based learning. New Zealand has invested heavily in change with research and practice in virtual world teaching and learning. The evidence is seen in the work discussed in this paper.

The technology and the virtual worlds NZ educators use may change but the one thing that will not change is the commitment of these educators to provide their students with the best learning experiences possible.

References

- Bers, M.U. (September/October 2008). Virtual worlds as digital playgrounds. *EDUCAUSE Review*, 43(5). Retrieved 16 June 2011 from <http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume43/VirtualWorldsasDigitalPlaygrou/163172>
- Blyth, P., Loke, S. K., & Swan, J. (2010). Otago Virtual Hospital: medical students learning to notice clinically salient features. In C. Steel, M.J. Keppell & P. Gerbic, *Curriculum, technology & transformation for an unknown future. Proceedings ascilite Sydney 2010*
- Champion, E., & Dekker, A. (2010). *Designing for Biofeedback: Blood Sweat and Fears*. Paper presented at the UX Australia 2010 Conference. Retrieved 24 April 2010, from <http://www.uxaustralia.com.au/>
- Dekker, A., & Champion, E. (2007, 24-28 September). *Please Biofeed the Zombies: Enhancing the Gameplay and Display of a Horror Game Using Biofeedback*. Paper presented at the Third International Conference of the Digital Games Research Association (DiGRA): Situated Play, Tokyo Japan. Retrieved June 8, 2011, from <http://www.nmc.org/horizonproject/2007/virtual-worlds>
- Falloon, G.W. (2010). Using avatars and virtual environments in learning: What do they have to offer? *British Journal of Educational Technology*, 41(1), 108-122. <https://doi.org/10.1111/j.1467-8535.2009.00991.x>
- Ministry of Education, (2007). *The New Zealand Curriculum*. Wellington: Learning Media Ltd.
- New Media Consortium and EDUCAUSE Learning Initiative (2007). *The horizon report: 2007*
- New Media Consortium and EDUCAUSE Learning Initiative (2011). *The horizon report: 2011 Publications and presentations arising from VWWG activities. (2011). DEHub, edu.au – Innovation in distance education*. Retrieved 24 April 2010, from <http://www.uxaustralia.com.au/>
- Salt, B., Atkins, C, Blackall, L. (2008). *Engaging with Second Life: real education in a virtual world*. Retrieved June 19, 2011 from <http://slenz.files.wordpress.com/2008/12/slliteraturereview1.pdf>
- Winter, M. (2010). *Second Life Education in New Zealand: Evaluation research final report, Milestone 2 Report, 9 March, 2010*. Christchurch: CORE Education Limited, Retrieved June 8, 2011, from <http://slenz.wordpress.com/slenz-project/final-evaluation-report>

Author contact details:

Merle Hearn merle.hearns@manukau.ac.nz

Other author contact details: <http://virtualworldsworkinggroup.wikispaces.com/Members>

Please cite as: Hearn, M., Diener, S., Honey, M., Cockeram, J., Parsons, D., Champion, E., Schott, G., Falloon, G., Thompson, D., Bell, T., Grimley, M., Green, R., Cochrane, T., Davis, N., Morrow, D., Corder, D., U-Mackey, A., Clear, T., Philpott, A., Davies, R., Loke, S.K., Atkins, C. & Gregory, S. (2011). He ara hou ka tū mai: NZ institutions of higher learning unpacking demands and facilitating change. In G. Williams, P. Statham, N. Brown, B. Cleland (Eds.), *Changing Demands, Changing Directions. Proceedings ascilite Hobart 2011*. (pp.571-579). <https://doi.org/10.14742/apubs.2011.1834>

Copyright © 2011 Merle Hearn, Scott Diener, Michelle Honey, Judy Cockeram, David Parsons, et al.

The author(s) assign to ascilite and educational non-profit institutions, a non-exclusive licence to use this document for personal use and in courses of instruction, provided that the article is used in full and this copyright statement is reproduced. The author(s) also grant a non-exclusive licence to ascilite to publish this document on the ascilite web site and in other formats for the *Proceedings ascilite Hobart 2011*. Any other use is prohibited without the express permission of the author(s).

