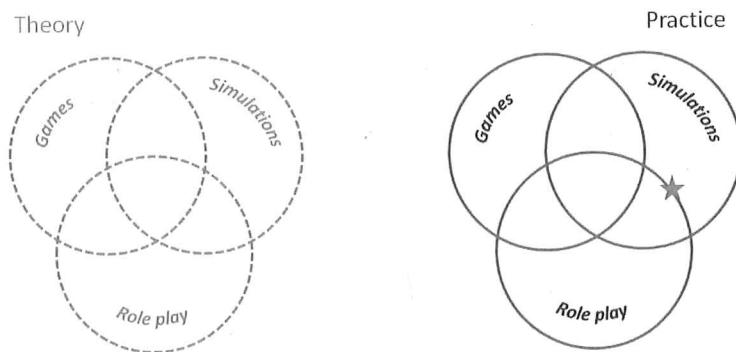Chapter Fourteen

Bridging and Scaffolding – From Powerlessness to Proficiency

Merle Hearns

Theory

Practice

Introduction

Manukau Institute of Technology in Auckland, New Zealand, (MIT) started its journey into virtual world teaching with the Foundation Project under the auspices of SLENZ (Second Life Education New Zealand). This experience has led to a continuation of the SLENZ Second Life (SL) environment and resources, and there are plans for these to be used by other departments on campus. Student feedback and results have provided evidence for the efficacy of using a virtual world to improve student retention and success.

MIT has been a provider of tertiary education for the past 40 years. It offers more than 1,500 courses at foundation, certificate, diploma and degree levels. Peter Brothers, CEO of MIT, says:

> *"MIT's mission is to serve our community at both an individual level and also at a wider community level ... Enabling people to access higher education is one of MIT's foremost strategic goals."* (Brothers, 2010:10)

Late in 2008, MIT submitted a proposal to SLENZ for a research project *"Engaging with Second Life; Real Education in a Virtual World"*. It was funded by the New Zealand Tertiary Education Commission Encouraging and Supporting Innovation Fund. Waugh (SL avatar name: Johnnie Wendt) [In computing, an avatar is the graphical representation of the user or the user's alter ego or character], the blogger for SLENZ, describes the aims of the project as follows:

> *"...the research project... aims to determine how multi-user virtual environments might be used to improve student learning... the project aims to delineate and demonstrate to New Zealand educators and students the educational strengths of learning in a virtual world as well as involving them on an on-going basis."* (Waugh, 2008:1)

The SLENZ Project was the beginning of the use of virtual worlds at MIT. The purpose-built student learning resources on Kowhai, an island in SL, continue to be used by Foundation students training in interviewing. SL has also been used for literacy activities and plans are underway for the use of OpenSim (an open source multi-platform, multi-user 3D application server) in similar educational projects. Departments in a number of distinct faculties have expressed an interest in incorporating virtual worlds within their course structures.

Instructional Theory

The initial stage of the SLENZ Foundation Project was an extensive literature review, to identify current approaches to structuring learning and teaching in virtual worlds. It found that the use of virtual worlds can enhance teaching but sound teaching principles remain a prerequisite.
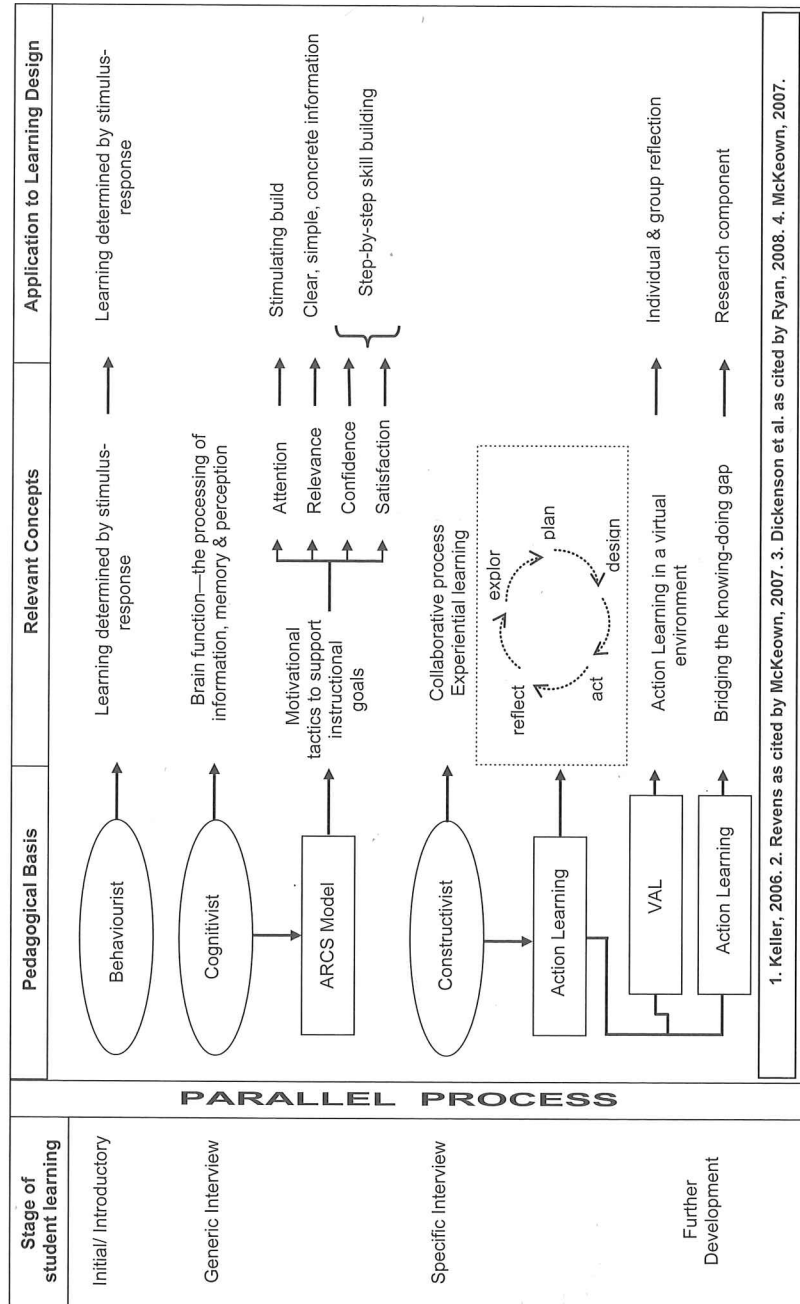
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Figure 1: Instructional Design Theories Underpinning the Learning Design in this Project

Instructional theory underlies the art, science and good practice of teaching and "...*includes how the teaching occurs, the approach to teaching and learning, the way the content is delivered and what the students learn as a result of the process.*" (Terminology and Definitions, 2008)

The theoretical approach used by the Foundation Project team was eclectic, drawing on a number of available theories. No single approach could adequately underpin work in SL – Figure 1 summarises the approaches used by the Project team.

One particularly useful theory for designing SLENZ learning activities and resources is John Keller's (2006) ARCs Model of Motivational Design. According to this model, promoting and sustaining learning motivation is accomplished by attention (through perceptual or inquiry arousal), relevance (using concrete language and examples), confidence (helping students realise they can succeed), and satisfaction (providing positive results and feedback) (Keller, 2006:7). Lemon (2009a) explains how these four guiding principles were adopted in the construction of learning activities used by the foundation project team.

The work of two further theorists was influential in designing learning activities. Firstly, Dickenson *et al.*'s Virtual Action Learning (action learning which takes place in a virtual environment, as cited by Ryan, 2008:9) and, secondly, McKeown's (2007) Action Learning.

The eclectic framework used by the SLENZ foundation team originated from the lack of one, single unifying theory that could explain teaching and learning in the virtual world of SL. It was hoped that the best activities would be made possible by this broad theoretical approach and that the results achieved by the SLENZ project would assist later researchers in the construction of a more useful instructional theory framework for use in virtual world learning designs.

Learning Context

The next stage of the SLENZ Foundation Project was to determine the learning context; that is, the context both of students and lecturers as they prepared to engage with the SL resources. The factors impacting on this learning context included the nature of the foundation students themselves, the learning aim of the project, the characteristics of the SL virtual world environment, and the effect of the use of technology on the learning.

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Foundation Studies

At MIT, foundation students have been the first students to use a virtual world for learning activities. The type of students enrolled in the Foundation Programme was an important consideration when identifying the learning context and subsequent design needs.

> "Tertiary education in our current world is a significant pathway into employment and the consequent societal benefits. Bridging/enabling education works to make these benefits accessible to people who are undoubtedly talented but who don't have the specific skills and credentials for entry to further study and the workforce." (Anderson, 2007:3)

Foundation, or bridging, education lays skills for academic and professional futures for students. A bridging programme provides a link between a student's past, previous learning opportunities, or lack thereof, and the possibilities for further academic environment. Foundation Education at MIT provides pathways into a variety of programmes including Business, Accounting, Computing and IT, Engineering, Marketing and Management, Nursing, Policing and the Armed Services, Social Work, Teaching, and Sport and Recreation Management.

MIT Foundation students come from more than 60 different countries, and range in age from 16 to 60 years. Students are a mixture of those who:

+ Chose to leave education early because the high school system was not working for them

+ Were forced to leave school because of financial necessity, early pregnancy or family need

+ Are at a crossroads and have made a conscious decision to change direction

+ Are battling with a new life in a new country and retraining in the English language (lemon, 2009a)

The NZ Tertiary Education Strategy mentions a rise in younger students at Foundation level (2002–7:15). This trend is apparent at MIT and is not

surprising bearing in mind statistics, reported by the former Manukau City Council, that 800 students in South Auckland leave school each year with few or no qualifications (Quality of Life, 2009).

Interviewing

Once the decision was made to submit a Project Proposal to SLENZ, it was important to determine a learning aim that would be relevant to all Foundation students. The aim chosen for the SLENZ Foundation Project was to develop students' interview skills. No matter their learning pathway students' ability to perform well at interview is crucial. Businessmen and women, engineers and IT professionals all have customer contact and make professional presentations, nurses take patient details, social workers record case notes, and teachers interview both pupils and parents. All students face job selection interviews.

Merle Lemon (SL avatar name: Briarmelle Quintessa) suggests that SL has distinct advantages over the real life classroom when teaching a practical skill such as interviewing (Lemon, 2009a). Learning a practical skill can be done in a practical rather than a theoretical way. Students can all be involved synchronously and there are no limitations created by classroom walls, time and resource constraints.

Some of the inspiration for the SL interviewing project came from Loyalist College in Second Life. They created a simulation for training border guards in interview techniques. Their executive summary notes:

> "The amazing results of the training and simulation program have led to significantly improved grades on students' critical skills tests, taking scores from a 56% success in 2007, to 95% at the end of 2008 after the simulation was instituted... The learning in these spaces is amazing, and when we are working with 30% increases in success, there is nothing more memorable than that. -- Ken Hudson, Managing Director, Virtual World Design Center, Loyalist College." (Linden Lab, 2009:1).

The SL Environment

SL was the virtual world chosen by the SLENZ steering committee. The Foundation Project team, under the leadership of Manukau Institute of Technology, considered that SL offered the characteristics that

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would suit the project aim and, hopefully, enable learning objectives to be met.

Salt *et al.* (2008), in the SLENZ Literature Review, suggest that the rich 3D environment of SL creates a high interest level and that engagement is enhanced by the ability of users to create a personalised avatar and interact with other users as they choose. They describe the emotional closeness of the shared experience and the sense of immediacy and presence (see also Habel & Müller, this volume). Kay and Fitzgerald (2008) in the Second Life in Education Wiki, describe learning activities in SL:

> "*The unique qualities of a 3D virtual world can provide opportunities for rich sensory immersive experiences... simulation and role-play... that cannot be easily experienced using other platforms.*" (Kay & Fitzgerald, 2008:1).

Lieb (1991) is one of many educators who has acknowledged that adult students have a great need for being in a community of learners. The project team considered SL ideal for promoting this in a positive manner. For many foundation students, life experience has included failure and rejection. Since interview preparation can be daunting, the relative safety of the SL environment can be supportive. Being represented by an avatar provides a sense of security encouraging more reserved students to participate in role-plays in this less threatening environment. Ryan (SL avatar name: Shelly Waco) (2008) notes how a virtual world environment allows a degree of anonymity and thus enhances the quality of communication, especially for the shy and reticent (see Davies in this volume).

Technology

The nature of the technology itself is an important consideration shaping the learning context behind the design of the SL interviewing activities. Ryan (2008:52) quotes Bates & Poole's (2003) finding that "*utilizing the features of a technology, in conjunction with good teaching, can significantly improve the educational effect.*"

According to Dede (2004), the technology of virtual worlds brings a movement towards student ownership of their learning as they engage more in the learning process. A desired outcome for all foundation learners is to become motivated, self-directed learners.

Prensky (2001) refers to the current generation as "Digital Natives" because of their familiarity with digitally based technologies, and Janet and Miles (2009:56) review numerous researchers who *"maintain that educators must adjust their teaching and learning models when working with this new generation or risk widening the communication gap between the students and their lecturers."*

There is a gradual increase in the number of younger "digital native" Foundation students, however there are other students – many of more mature age – with limited exposure to computers or lacking digital skills completely. This digital literacy gap must be bridged during the period of foundation study so that all students acquire the skill sets needed to fulfill requirements on the way to academic qualifications. The SLENZ Foundation Project offered a means of bridging the digital literacy gap while enabling acquisition a practical and essential skill.

The SLENZ Pilot: Tentative Tiptoes

The SLENZ pilot commenced on August 17th 2009. Students at MIT and at Northland Institute of Technology were the first to use the specialised environment created on the island of Kowhai in SL for the use of foundation students.

> *"The build on Kowhai has the feel of New Zealand with ponga and pohutukawa trees, so that students can identify with the environment, as well as a futuristic design that draws on the elements of fantasy to promote creativity... The build is designed to be functional, unambiguous and re-usable."* (Lemon & Kelly, 2009:5).

This build includes a large hyperdome (an externally dome-shaped building, internally containing a variety of possible scenes that can be changed at the click of a button on a controlling console). The scene options that can be made visible and useable include a shop with changing rooms and stands that becomes a catwalk and seating area, or a demonstration interview room, or a media and discussion area. Resources include a Stairway of Learning (a literal set of stairs) where information boards on the landings hold interactive quizzes on content.
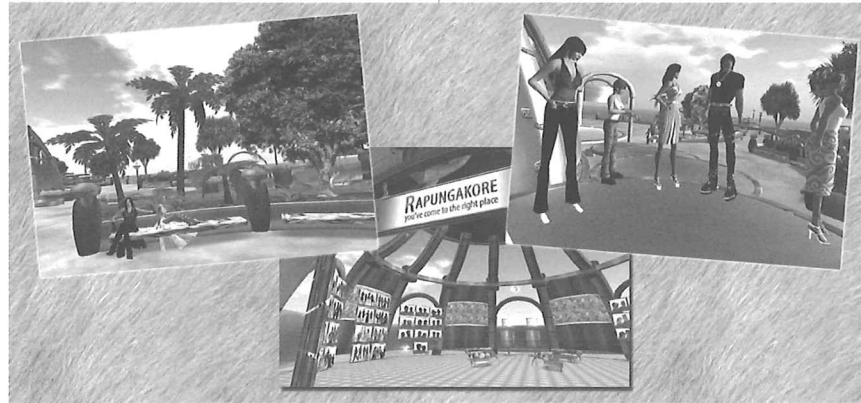
Figure 2: Outside the Hyperdome with New Zealand Vegetation; Students on the Stairway of Learning; Rapungakore, the Clothing Store, inside the Hyperdome

From a further set of platforms or stairs, students can access interview rooms. Transport from location to location in SL can be done using teleportation. There are twelve teleporters to transport students to interview rooms. Students select from a menu indicating whether they want to go to a general interview room, a career pathway interview room, or a specific job interview scenario. Students start with the general interview room until they have gained some degree of competence. Career pathway interviews include teaching, nursing, and policing. Further choices include a telephone interview room and a whānau (the Māori word for family) interview room. There are five specific job interview scenarios. The interview rooms have lists of generic and behavioural interview questions to guide interviewers and interviewees. The five specific job interview scenarios include National Bank (finance), 3M (marketing), Rainbow's End (travel and tourism), Motorworx (automotive), and Hell's Pizza (hospitality/customer service). These companies participated in the preparation of resources that include real job advertisements and descriptions, as well as interviewer scripts for each scenario. Students have to prepare for these interviews by locating web information about their companies and jobs.

The initial sessions in SL had both positive and negative outcomes. Ryan (2008:6) quotes Schank and Cleary (1995) who *"tell us that when students are having fun, they may not notice how much they are learning."*

The students in SL appeared to be doing just that. Witnesses observed that student motivation was extremely high and that they were happily

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Figure 3: Interviewing in the Lab & SL. MIT, 2009

engaged in the learning activities. Students were very supportive of each other. The main problems encountered early on, were technical. The available lab was not designed as a student lab. It was a teacher lab with 11 computers that were not uniform – nine were PCs and two were Macs. The computers were networked but not all computers communicated with each other. Another problem in early sessions concerned the additional audience. There were too many people in the computer lab who were not members of the class, including senior management and media representatives; they proved to be a distraction to the students.

In her blog, Lemon (2009b:1) recalls the reaction of students to SL: *"Even the most unenthusiastic and unmotivated students were 'sucked into' the excitement of the virtual environment!"*

Student enthusiasm can be illustrated through a number of anecdotes. For example an older Samoan gentleman in the first SL class had never worked on a computer before. The lecturer showed him the basics of movement and as he succeeded in moving his avatar, he started to smile. Then he was shown how to fly and happiness was overtaken by

sheer excitement. Success in these small steps gave him a feeling of self-confidence. In further sessions he developed his level of digital literacy as he worked on his interview skills. He sought extra help in interviewing and came "in-world" in the evenings to practise with his lecturer and with fellow students. Lemon (2009a) notes how attendance improved from session to session as students heard about the work that was being done in SL. For example:

> "Two students in trouble for poor attendance and behaviour were present in all Second Life sessions [and] seemed fully engaged and worked hard to complete tasks." (Lemon, 2009a:10)

After each session in SL students wrote their feedback on notecards which were given to the lecturer. These reflected general satisfaction with the work being done in SL, for example:

> "Student A: I am not worried about going for my real life interview anymore as I now know I can do it, and the SL practise has been so REAL!
>
> Student B: I thought being interviewed was a good experience, especially being interviewed by someone I am not familiar with. It was especially good to have to think about those answers as I haven't really been asked any of them before." (Lemon, 2009a:10–11)

Cheal (2009), in discussing SL teaching, notes that her decision to educate in SL was based on the premise of the similarity of SL to video games would motivate students to participate and to learn. however, she concludes that:

> "...these same similarities may also lead students to perceive virtual worlds as play spaces rather than as innovative educational environments. If students feel that learning opportunities offered in such spaces are not valid, they are likely to feel that they are not learning." (Cheal, 2009:7)

From the total student body in the two MIT Future Focus classes trained in SL, the SLENZ Evaluation Report (Winter 2010), identified only one

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student who felt negative about the experience. This student's complaints were based on the interviewing experience itself – she did not want to reveal personal information to a fellow student (which would also have been a problem for her in a normal classroom). She also felt that she could not be expected to learn anything from a game, possibly falling into the group identified by Cheal (2009).

Winter's report notes how the the SLENZ approach leads to cross-cultural learning and collaboration. One example of this occurred with two disparate groups of students who discovered similarities and friendships when cultural, age and gender barriers were broken down in the safety of the SL learning environment. A group of more mature Polynesian ladies became friends with a group of international students, young men from China. This started when one of the young Chinese men accidentally lost his formal suit in SL. He started chasing an avatar belonging to one of the Samoan ladies. This was a source of enormous amusement, temporarily engaged both groups of students and then leading to a deeper and more lasting effect. The two groups started chatting, voluntarily paired off in interview practice sessions, and were seen informally chatting in real life (RL) months later.
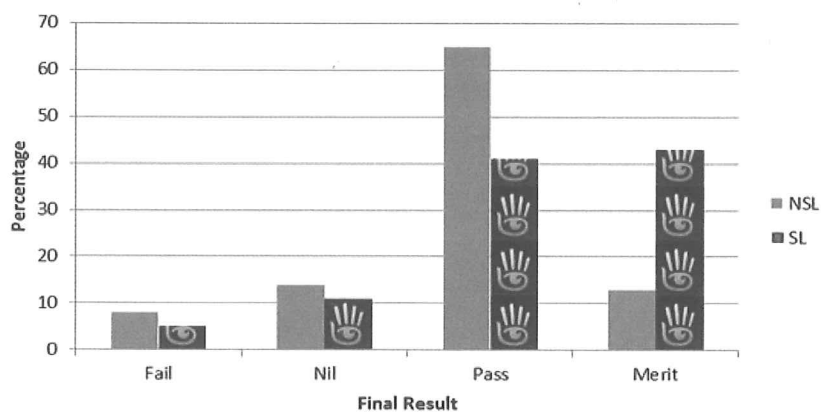

Table 1: Interview Results for FFCarPl (Future Focus Career Planning) Students, Semester 2, 2009

More formal evidence of the success of the SL sessions is shown in the analysis of course results (see Table 2). Interviewing was one of three assessments for a course called Future Focus Career Planning. The first

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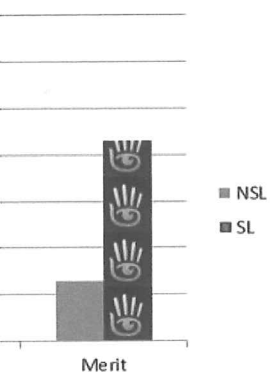
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assessment task is submission of a *curriculum vitae* (CV), the second is an interview, and the third is a research-based assessment where students have to find information on their chosen job and career path and provide evidence of their research. All students, no matter which Future Focus class they are in, are interviewed in exactly the same way. An RL interview is scheduled with an external interviewer. The interviewer does not know the classes, the students or the lecturers. Students dress for the interview, arrive at the designated time with their CVs and are interviewed for about 20 minutes. The guest interviewer completes assessment sheets, which are later sorted and returned to the lecturers. The marks for all students ae listed in the results recording program (known as Jaspar) currently in use at MIT. Students are awarded a Merit Pass, for exceptional performance, a Pass, or alternatively a Not Complete (e.g. not arriving at the interview at the required time) or a Fail (not reaching the required standard). The results shown in Table 1 indicate the effectiveness of the SL addition to the course presentation. Based on this outcome, the SL intervention has been offered within the Future Focus course in subsequent semesters.

The Present Position: Powerful Praxis

The Future Focus Career Planning course is part of a six-month programme, Level 3 Foundation Studies. Every six months a new group of students is faced with interview preparation. The second course iteration, as discussed in this section, occurred a year after the first SLENZ results were obtained. A computer lab built as a specialist SL lab was used by MIT Foundation students studying the Future Focus course, for the first time in Semester 2, 2010.

Computers in this lab were extensively tested to ensure that audio systems were running well and that the lab could cope with all machines running SL simultaneously. The IT Department could set up this lab because the communications pipeline running into MIT had doubled in capacity between 2009 and 2010. Two classes completed all course work in this lab and were able to prepare for their interviews using the simulation on Kowhai. These students were also given their third assignment in SL. The assignment required that each student would do in-depth research into their own career path to find relevant and vital information

Figure 4: Assignment 3: THINC Books on "Social Work" and "Medic in the NZ Army"; an Assessment Challenge Near the End of the Course

they could share with the rest of the class. The SL students produced this information in the form of a "THINC Book" (a large book that stands the size of an avatar and can be paged through like a normal book.). Figure 4 shows two photos of student avatars standing beside their THINC books. This cohort of students in SL produced even better results in their interviews and assignments. The raw data and the graphed results for the interview assessment are shown in Table 2 and Table 3.

The results for Semester 2, 2010 are remarkable. As in 2009, only two classes out of a total of 10 Future Focus classes were trained in SL. An external interviewer assessed all students. The interviewer was not aware that some students who presented themselves at the interview assessment had learned in SL and some had not been told anything about SL. The lecturer who conducted the classes in SL had no contact with the interviewer and merely collected the interview reports after the assessment was completed.

The use of SL training in the second and third assessments could explain why the students in the two SL groups gained better results. However, there was also an improvement in their results for the first assessment, which did not use SL. This suggests there was another factor

Passes for Assessment 1 – CV:
SL – 100% pass rate
Non-SL – 86.3% pass rate
Passes for Assessment 2 – Interview:
SL – 100% pass rate
Non-SL – 81.5% pass rate
Passes for Assessment 3 – Research:
SL – 100% pass rate
Non-SL – 82.3% pass rate
Overall passes SL v non-SL:
SL – 100% pass rate
Non-SL – 81.5% pass rate

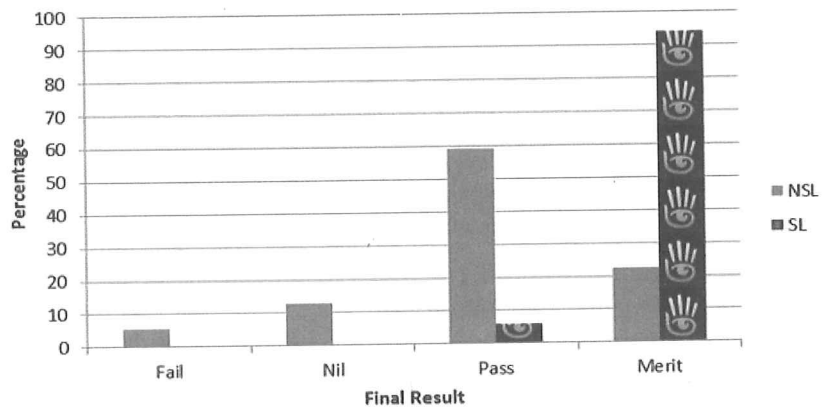*Table 2: Table Showing Overall Assessment Results, Semester 2, 2010*

Table 3: Interview Results for FFCarPl (Future Focus Career Planning) Students, Semester 2, 2010

at work. In fact, the students in both classes had been told that they would not be allowed into SL until the first assessment was completed satisfactorily. Therefore, motivation was high to achieve a good result so that they could experience the SL environment.

The work completed at MIT since the SLENZ Project has emphasised the validity of the conclusions reached by Winter in the SLENZ Evaluation Report. In his summary of the anecdotal strengths of virtual

environments, compared with other online environments, he states that there was evidence of increased engagement of learners. This increased engagement has been repeatedly seen at MIT and supported by improved results for retention and success. Winter (2010) adds that 2L was shown to have created experiential learning situations that are not available in "real life".

> *"...the opportunity rarely exists for potential job interviewees to try on and obtain feedback on the suitability of different modes of dress for attending interviews. Another opportunity ... was that of being interviewed in virtual rooms that had been designed to mimic real-life interviewing environments, in some cases by external interviewers. This is something that is not readily available to students in real life institutions."* (Winter, 2010:54).

This explanation appears to account for at least part of the dramatic improvement in students' results. Winter (2010:54–55) went on to comment on possible evidence for a third unanticipated benefit: namely the opportunity to acquire skills necessary to operate socially, technically, and ethically in an online global virtual world although this was limited in the study by technical problems. The improvements of results from 2009 to 2010 can also partly be attributed to the improvement in the technical delivery to students with the new lab, PCs with improved specifications and increased bandwidth.

The last strength that Winter (2010) comments on is the experience and practice of collaborative, cross-cultural problem solving in social networking environments. In his view this has been achieved, and the recent work by students in SL continues to support Winter's assertion.

Conclusion

MIT started its SL journey with the SLENZ Project. The results from this pilot scheme demonstrated that the application of SL for learning has been highly effective. Students who participated in the interview simulation in SL achieved better results in their interview assessments than students taught in the traditional classroom setting. Students participating in a later iteration were able to participate in their simulation

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without the technical difficulties experienced by the first SLENZ partic-ipants. The depth of the learning transformation experienced by these students was highlighted when almost every student achieved a Merit Pass, the highest achievement possible.

This ability to use SL for interviewing practice was just the begin-ning. The interview scenario built in SL has recently been used for other purposes, including postgraduate research interviews. There are plans from other departments to use them in the near future; for example, the Nursing Department will be incorporating it for their student nurses to learn about taking patient notes. Interest in virtual worlds among staff at MIT is growing. Staff in the Teaching, Nursing, ESOL, and Business Services areas have already received training in SL and have plans for developments. Applications for other projects have also been submitted, including a Literacy Project in OpenSim.

Atkins, joint leader of the SLENZ project, has been involved in SL teaching and research for a number of years. At the completion of a student project in 2008, Atkins stated:

> *"(we) emerged from the project with a strong belief in the value afforded by the Second Life environment, a strong sense of the apparently limit-less possibilities for education and a very clear understanding that we are currently on the edge of a major shift in educational delivery for which the maps are only in the very early stages of development."* (Atkins, 2088:88)

MIT has shown that SL can be an asset in engaging and motivating students, and in providing an environment in which they can take charge of their learning, develop new skills, and achieve personal learning aims and objectives. Simulations in virtual environments can transform teaching into learning.

About the Author

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