

Second Life and Higher Education: New Opportunities for Teaching and Learning

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Abstract

Over time, higher education has been repositioned in terms of the delivery of courses. While traditional face-to-face teaching still occurs, there has been a major shift to encompass not only some online teaching and learning approaches for on-campus (internal) students, but also the delivery of courses wholly online to off-campus (distance education/external) students. This has necessitated adjustments in the way higher education institutions use technology for teaching and learning. At the University of New England (Australia) the authors have been researching the efficacy of one virtual world, *Second Life*, for teaching and learning. Two research pilots have provided data to demonstrate that students were engaged in their learning and appreciative of this innovative approach to teaching and learning online. In 2010, the authors commenced a new research project to ascertain whether students learning via this virtual world environment performed better in their assessment tasks than those students who used a traditional learning management system. Data indicate that this is the case. In this paper, the current research project is firstly situated within the range of research conducted by the authors in *Second Life*. Its aims are then outlined, the research methods described and one aspect of the data presented and analysed. Indications for future research are then explored.

Key Words: Virtual worlds, *Second Life*, higher education, distance education, student outcomes.

1. Introduction

In 2010, the authors commenced a research project to explore whether student interaction in a virtual world (in this instance *Second Life*) has greater impact on learning, as evidenced in the quality of assessment work, than the interaction available through tools available in learning management systems (LMS). This project built on two prior projects in 2008 and 2009. These are briefly reported as background context in section 4 of this paper and more detailed descriptions of them are reported in other publications¹. The driving force behind all three research studies into the

feasibility and effectiveness of teaching and learning in virtual worlds was the changing face of higher education with its greater flexibility of study through distance education and an increased uptake in online learning. They were also influenced by an increase in the use of virtual worlds for education purposes².

2 Higher education and online learning

Online learning is increasing in momentum in higher education³. While on-campus students have access to this online learning, the main target has been distance education students. Gutierrez (2010) argues that distance education is “becoming a reality of the educational environment not only in the US but also worldwide”⁴ and one has only to scan the Internet for distance education courses to discover that this equally applies to Australia. Technology has assisted in the change in distance education from primarily solitary study based on correspondence materials (paper and CD) to study where there is capacity for interaction⁵.

The delivery of online learning is predominantly through a LMS. In a LMS students have interactivity, usually asynchronous, through a range of Web 2.0 tools such as blogs, wikis, discussion boards and chat rooms. In worst-case scenarios, an academic uses the LMS only to deliver learning material through html and Portable Document Format (PDF) downloadable documents and to provide a forum for answering of student questions. In this situation, the technology is being used because it is available. However, it is important to note “online learning is not about technology. It is about a new paradigm of learning”⁶. Many higher education institutions are embracing new paradigms and are developing online learning experiences not only in a LMS, but also in virtual worlds.

3 Virtual worlds in higher education

Virtual worlds are experiencing exponential growth. New worlds “spring up daily, it seems”⁷ and these “are no longer the preserve of the stereotypical geek, nor are they just technical or social curiosities that educators ... can safely ignore”⁸. While a variety of virtual world platforms are being used for educational purposes⁹ *Second Life* is emerging as the forerunner in this area¹⁰. It seems unlikely that virtual worlds are going to go away having shown “the same growth pattern and potential as the Internet”¹¹.

Educators are developing the use of virtual worlds in a range of educational spheres, including higher education, thus helping “to claim these spaces for social and educational purposes”¹². The affordances of virtual worlds, such as the capacity for immersion, simulations and extended interactions¹³, allow for a variety of teaching and learning strategies to be

developed in-world (in *Second Life*) which can enhance learning for all students and most particularly for distance education students. A strong factor in this enhanced learning is the capacity of virtual worlds to facilitate social presence¹⁴. A feeling of having presence in a learning community has been demonstrated to have positive correlation with student satisfaction and collaborative learning¹⁵.

As research into the efficacy of virtual worlds for educational purposes continues, there is a “focus on the actual teaching and learning practices and on their assessment in the virtual learning environment”¹⁶. The authors’ research forms part of this wider corpus of research.

4 Two preliminary research studies

The University of New England (UNE) in New South Wales, Australia, is a regional university with 80% of its students studying in the distance education mode¹⁷. The main online teaching and learning platform for these students has been the use of a LMS. The main form of interaction between student/student and student/academic has been via blogs, discussion boards and wikis, with some use of chat room, although this latter is generally between students rather than with academics.

As academics in the School of Education, the authors believe that, while the use of LMSs has provided some excellent examples of teaching and learning for distance education students, the affordances of these platforms are not enough to develop strong communities of practice. In 2008, Gregory commenced the first research project within UNE into the effectiveness of *Second Life* as an environment that could promote student engagement and learning.

This first project commenced with Gregory building a space in *Second Life* where her students could meet, both formally and informally, to discuss study concepts and to explore *Second Life* as an environment with educational possibilities. The data reveal that this virtual world environment was engaging, promoted learning and also developed a sense of real presence. This last is evident in one student’s commenting that:

I had a defining experience last week when we sat down in that open-air lecture space and I sat on one side and the rest of you sat on the other side. Suddenly I felt lonely and, without thinking, got up and moved to where you were all sitting. And then, I thought, that felt so real!

The success of this project prompted Gregory to continue the study with new students over the each of the next two years¹⁸.

Building on the positive results of the 2008 project, in 2009 Gregory and Masters began a co-researched study on the effectiveness of *Second Life*

as an environment where teaching and learning strategies used with on-campus students could be replicated in-world through role play activities. There was also the aim to explore the ease of use of such a virtual environment for novice users, both academic and students. In the first iteration of this study the teaching and learning occurred with on-campus students in case there were technical issues for the novices. The results indicated that students had similar perceptions of both face-to-face and virtual world teaching. Masters, who taught both the real life and *Second Life* sessions, found that there was improvement in-world with each subsequent workshop (five were conducted in all). This gave credence to the authors' belief that *Second Life* would provide a learning environment that was relatively user-friendly.

The general success of this study in 2009 meant that it was extended to off-campus students in 2010 and the de Bono Six Thinking Hats strategy, that had been the focus of the role play tutorial in the first iteration, was experienced solely in the virtual world¹⁹. The effectiveness of teaching and learning in a virtual world space is apparent when one off-campus student commented that:

The opportunity to use Six Thinking Hats strategies in a group situation to guide discussion was deeply beneficial. It gave me a clearer understanding of how to use the hats, and provided an insight into how it may be used in a classroom (something that up until the *Second Life* session had eluded me)²⁰.

5 Aims of the New Research Project

When the data from the two earlier research projects demonstrated that the use of a virtual world as an educational environment is effective, the decision was taken to commence a new research project that would examine whether the use of *Second Life* as a learning environment has a positive effect on student performance.

In 2010 the authors conducted a study across seven education subjects. The aim was to compare student performance, as indicated by formal assessment results, between students who used the virtual world learning environment for their learning and those whose interactions were predominantly through the LMS.

6 Method

After ethics approval the authors gathered data across seven Education subjects six of which were Information Communication

Technology (ICT) in Education subjects and two were Learning and Teaching subjects. All of these subjects had off-campus students and three were offered only in off-campus mode.

At the beginning of each semester students were able to elect to join groups which would meet in *Second Life* or to join groups within the LMS. All students were to complete common assessment tasks, but discussions for the students who chose to join a *Second Life* group occurred in-world. For the other students, there were choices between using discussion boards only and using other LMS tools such as chat room, blogs, and wikis. Self-selection into groups studying in *Second Life* meant that there was no academic bias in the allocation of students. One factor that impacted on student choice was their computer capacity and bandwidth. Those students without good capacity generally chose not to take part in these groups.

Tutorials were held on a voluntary basis in *Second Life* once a week and were generally scheduled for between one and two hours, but frequently went longer. During these tutorials students were given opportunities to discuss subject material and assessment tasks with their academics as well as interact with each other. Students in non-*Second Life* groups had the capacity to ask questions and have the same form of discussions via the LMS.

At the end of both semesters students were asked to complete a survey. This survey collected data about whether they had used *Second Life*, a LMS or both. Data was also collected about their general use of technology. Demographic data such as age and study location of each student was gathered and each student was also asked to rank, on a six point likert scale from very high to none, various aspects of the environment that they used in terms of the impact that they perceived these had on their learning. The survey permitted open-ended comments to elucidate their responses.

After the official release of results analysis was undertaken to compare the grades achieved by the *Second Life* cohort (group of students) and by the rest of the off-campus cohort (all *Second Life* participants were off-campus students) and also to compare these results with the on-campus results.

7 Results and Findings

Only one aspect of the results, performance on final grades, is reported in this paper. There were a total of 1622 students enrolled in the seven Education subjects in the research project, with 96 volunteering to study in *Second Life* and 1526 opting not to. Figure1 depicts the comparison between the grades that the two groups of students received at the end of their study.

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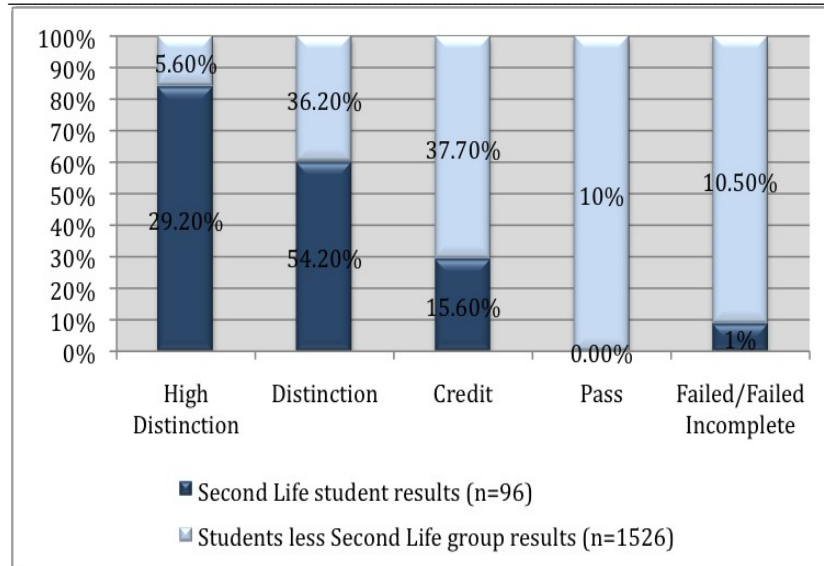


Figure 1: Comparison of results across seven Education subjects in 2010 between *Second Life* students and those who didn't use *Second Life* in their studies (n=1622).

As can be seen, 29.2% of the group that chose to study via *Second Life* received a High Distinction (HD) with only 5.6% of the non-*Second Life* group. This significantly larger percentage from the *Second Life* cohort was also evident in the Distinctions (D) earned by the students, being 54.2% in comparison to 36.2%. There was a relatively low proportion of students who received a Credit (C) grade for their studies in the *Second Life* group (the majority having received HDs and Ds), whilst just over a third of the non-*Second Life* students received a Credit. No students from the *Second Life* group received a grade of Pass (P) compared with 10% of the non-*Second Life* cohort. The other major difference in performance (as judged by official grades) is in the Failed/Failed Incomplete (N/Ni) results. Only one of the 96 students in the *Second Life* cohort received an NI (with the other 95 receiving grades of C or higher), whilst 10.5% of the non-*Second Life* group received an N or NI for the subject. Overall, the group that studied in *Second Life* performed at a much higher level.

8 Conclusion

From the analysis of final grades, it could be concluded that virtual worlds provide educational platforms where students excel in their grades. However, while the results support that *Second Life* is an effective educational environment that does not have a negative impact on learning based on assessment results, it cannot be argued that the virtual world component of the students' studies was the only, or even major, factor that assisted in the achievement of higher grades compared to the non-*Second Life* cohort.

Over 60% of the 1622 students were first year students. This has meant that it is difficult to ascertain whether the students who chose to use *Second Life* were students with a higher grade point average (GPA) than the other students. It is also difficult to ascertain whether those students who chose *Second Life* are more motivated. More research must be conducted including, if possible, research in to the lifestyle and study commitment of students and also the motivation behind their choice to use, or not use, a virtual world as a study environment.

In 2011 the authors intend to continue their research into the effect of teaching and learning in *Second Life* on student performance. They will both be teaching across several subjects and there is an opportunity to increase the statistical significance of the data with a larger cohort.

An exciting research development for 2011 has been the receipt of an Australian Learning and Teaching Council (ALTC) grant to work in collaboration with five other universities, four in Australia and one in Germany, to explore the use of *Second Life* as a platform for microteaching and virtual professional experience. Off-campus students, who are currently prepared for their teaching placements solely through readings, reflections and online quizzes, will have the opportunity to experience teaching in-world with the aid of pre-programmed child avatars (robots) and also to teach with peer and self appraisal. Moving into an area of virtual teaching practice will take preparation and support for professional experience into a new realm.

It is the emergence of virtual world technologies, with their capacity for active experiential learning, which has provided the potential for the authors to develop classroom and playground spaces. These spaces will permit practice teaching at least comparable to a live classroom experience and, possibly, enhanced experiential options²¹. The students will have opportunities, through interaction in and with the virtual environment, to practise skills and apply concepts in a realistic setting that is also risk free²². There have been few attempts to try this form of new approach in Australia indicating that this research is exciting, innovative and cutting edge.

Notes

¹S.Gregory & B. Tynan, 'Introducing Jass Easterman: My Second Life learning space', in *Same places, different spaces, Proceedings ascilite2009 Auckland*, 2009, pp. 377-386, <http://www.ascilite.org.au/conferences/auckland09/procs/gregory.pdf>.

S. Gregory & Y. Masters, 'Six Hats in Second Life: Enhancing Preservice Teacher Learning in a Virtual World', in *Advancing Learning with ICT: Innovate Collaborate Transform. Presented at the International Conference on Teaching and Learning with Technology 2010 (iCTLT), Singapore*, 2010a.

S. Gregory & Y. Masters, 'Virtual Classrooms and Playgrounds - Why would anyone use them?', in *Proceedings of the 4th Annual Postgraduate Research Conference*, 2010b, pp. 120-129.

S. Gregory & H. Smith, 'How Virtual Classrooms are changing the Face of Education: Using Virtual Classrooms in Today's University Environment', in W. Holloway & J. Maurer (Eds.), *International Research in Teacher Education: Current Perspectives*. Armidale: University of New England. 2010, pp. 239-252.

Y. Masters & S. Gregory, 'Second Life: Harnessing virtual world technology to enhance student engagement and learning', in *Rethinking learning in your discipline*, University Learning and Teaching Futures Colloquium 2010, Armidale, NSW, in press.

²G. Salmon & D. Hawkrige, Editorial, *British Journal of Educational Technology*, vol. 40, 2009, pp. 401-413.

T. Cummings, Education and the Second Life Ecosystem. Presented at the Virtual World Best Practices in Education (VWBPE) 2010, Presentation, VWBPE North Second Life. Retrieved from <http://www.vwbpe.org/>.

B. Dalgarno, M.J.W. Lee, L. Carlson, S. Gregory & B.Tynan, '3D immersive virtual worlds in higher education: An Australian and New Zealand scoping study', in C.H. Steel, M.J. Keppell, P. Gerbic & S. Housego (Eds.), *Curriculum, technology & transformation for an unknown future. Proceedings ascilite2010 Sydney*, 2010 (pp. 269-280). <http://ascilite.org.au/conferences/sydney10/procs/Dalgarno-full.pdf>.

³ I. Gutierrez, 'Global Perspectives in Open and Distance Learning and Open Learning Resources', *Distance Learning*, vol. 48, issue. 1, 2010, pp. 16-22.

S. Hiltz & M. Turoff, 'Education goes digital: the evolution of online learning and the revolution in higher education', *Communications of the ACM*, vol. 48, issue 10, 2005, pp. 59-64.

M. Puzifferro & K. Shelton, 'Challenging Our Assumptions about Online Learning: A Vision for the Next Generation of Online Higher Education', *Distance Learning*, vol. 6, issue. 4, 2009, pp. 9-20.

⁴ Gutierrez, p.16

⁵ ibid.

⁶ Puzifferro & Shelton, op.cit.,p.9

⁷ A. Kelton, 'Virtual worlds? Outlook good', *EDUCAUSE Review*, vol. 43, issue 5, September/October 2008, p.16.

⁸ L. Jarmon, K. Lim & B. Carpenter, II, 'Introduction: Pedagogy, Education and Innovation in Virtual Worlds', *Journal Of Virtual Worlds Research*, vol. 2, issue 1, 2009, p.3.

⁹ S. de Freitas, *Serious virtual worlds: A scoping study*, Bristol, UK: Joint Information Systems Committee, 2008, 6 January 2010,

<http://www.jisc.ac.uk/media/documents/publications/seriousvirtualworldsv1.pdf>

Dalgarno, loc. cit.

Gregory, S., Reiners, T., & Tynan, B., 'Alternative Realities: Immersive Learning for and with Students', in *Distance Learning Technology, Current Instruction, and the Future of Education: Applications of Today, Practices of Tomorrow* In H. Song (Ed.), Texas Southern University, Houston, USA: IGI Global, 2010, pp. 245-271

S. Gregory et al., 'Australian higher education institutions transforming the future of teaching and learning through virtual worlds', in C. Steel, M. Keppell & P. Gerbic (Eds.), *Curriculum, technology & transformation for an unknown future*, ascilite2010, Sydney. 2010, pp. 399-415, <http://ascilite.org.au/conferences/sydney10/procs/Gregory-full.pdf>

¹⁰ C. Campbell, 'Learning in a different life: Pre-service education students using an online virtual world', *Journal of Virtual Worlds Research*, vol.2, issue 1, 2009, <https://journals.tdl.org/jvwr/article/view/379/451>

S. Warburton, 'Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching', *British Journal of Educational Technology*, vol. 40, issue 3, 2009, pp. 414-426.

Gregory et al., loc. cit.

¹¹ Kelton, op. cit., p. 22.

¹² S. Schutt & J. Martino, J 'Virtual worlds as an architecture of learning', in *Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008*. 2008, pp. 900-902,

<http://www.ascilite.org.au/conferences/melbourne08/procs/schutt-poster.pdf>

¹³ Warburton, loc. cit.

¹⁴ J. Short, E. William & B. Christie, *The social psychology of communication*. New York: John Wiley, 1976.

¹⁵ H. J. So & T. A. Bush, 'Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: relationships and critical factors', *Computers & Education*, vol. 51, issue 1, 2008, pp. 318-336.

¹⁶ Larmon, Jim & d Carpenter, op. cit., p 4.

¹⁷ Gregory & Tynan, loc. cit.

- ¹⁸ For more detailed discussion of this project see:
 Gregory & Tynan, loc. cit.
 Gregory, Reiners & Tynan, loc. cit.
 Gregory & Smith, loc. cit.
- ¹⁹ E. de Bono, E., *Six Thinking Hats*. London: Penguin Books, 1985.
- ²⁰ For more detailed discussion of this project see:
 Gregory & Masters, *Six Hats in Second Life*, loc. cit.
 Gregory & Masters, *Virtual Classrooms and Playgrounds*, loc. cit.
 Y. Masters & S. Gregory, loc. cit.
- ²¹ C. Aldrich, *Simulations and the future of learning*, San Francisco: Pfeiffer, 2004.
- ²² D. Antonacci & N. Modaress, *Second Life: The educational possibilities of a massively multiplayer virtual world (MMVW)*. 2005,
<http://www2.kumc.edu/ir/tlt/SLEDUCAUSES2005/SLPresentationOutline.htm>

Bibliography

Aldrich, C., *Simulations and the future of learning*. San Francisco: Pfeiffer, 2004.

Antonacci, D. & Modaress, N., *Second Life: The educational possibilities of a massively multiplayer virtual world (MMVW)*. 2005,
<http://www2.kumc.edu/ir/tlt/SLEDUCAUSES2005/SLPresentationOutline.htm>.

Cummings, T., Education and the Second Life Ecosystem. Virtual World Best Practices in Education (VWBPE), Presentation, VWBPE North Second Life, 2010. <http://www.vwbpe.org/>

Dalgarno, B., Lee, M.J.W., Carlson, L., Gregory, S., & Tynan, B., '3D immersive virtual worlds in higher education: An Australian and New Zealand scoping study', in *Curriculum, technology & transformation for an unknown future. Proceedings ascilite2010 Sydney*. C.H. Steel, M.J. Keppell, P. Gerbic & S. Housego (eds.), 2010, (pp. 269-280).
<http://ascilite.org.au/conferences/sydney10/procs/Dalgarno-full.pdf>

de Bono, E., *Six Thinking Hats*. London: Penguin Books, 1985.

de Freitas, S., *Serious virtual worlds: A scoping study*. Bristol, UK: Joint Information Systems Committee, 2008,
<http://www.jisc.ac.uk/media/documents/publications/seriousvirtualworldsv1.pdf>

Dykman, C., & Davis, C., 'Part one--the shift toward online education', *The Free Library*. March, 2008,
http://www.thefreelibrary.com/Part+one--the+shift+toward+online+education.-a0233828124_

Gregory, S., Lee, M. J., Ellis, A., Gregory, B., Wood, D., Hillier, M., Campbell, M., Grenfell, J., Pace, S., Farley, H., Thomas, A., Cram, A., Sinnappan, S., Smith, K., Hay, L., Kennedy-Clark, S., Warren, I., Grant, S., Craven, D., Dreher, H., Matthews, C., Murdoch, D., McKeown, L., 'Australian higher education institutions transforming the future of teaching and learning through virtual worlds', in *Curriculum, technology & transformation for an unknown future*. C. Steel, M. Keppell, & P. Gerbic (eds.), Sydney, 2010, pp. 399-415,
<http://www.ascilite.org.au/conferences/sydney10/Ascilite%20conference%20proceedings%202010/Gregory-full.pdf>

Gregory, S. & Tynan, B., 'Introducing Jass Easterman: My Second Life learning space', in *Same places, different spaces, Proceedings ascilite2009 Auckland*, 2009, pp. 377-386,
<http://www.ascilite.org.au/conferences/auckland09/procs/gregory.pdf>

Gregory, S. & Masters, Y., 'Six Hats in Second Life: Enhancing Preservice Teacher Learning in a Virtual World', in *Advancing Learning with ICT: Innovate Collaborate Transform. International Conference on Teaching and Learning with Technology 2010 (iCTLT), Singapore*, 2010a.

Gregory, S., & Masters, Y., 'Virtual Classrooms and Playgrounds - Why would anyone use them?', in *Proceedings of the 4th Annual Postgraduate Research Conference*. University of New England, 2010b, pp. 120-129.

Gregory, S., Reiners, T., & Tynan, B., 'Alternative Realities: Immersive Learning for and with Students', in *Distance Learning Technology, Current Instruction, and the Future of Education: Applications of Today, Practices of Tomorrow*. H.

Song (ed.), Texas Southern University, Houston, USA: IGI Global, 2010, pp. 245-271.

Gregory, S., & Smith, H., 'How Virtual Classrooms are changing the Face of Education: Using Virtual Classrooms in Today's University Environment', in *International Research in Teacher Education: Current Perspectives*. W. Halloway & J. Maurer (eds.), Armidale: University of New England. 2010, pp. 239-252

Gutierrez, I., 'Global Perspectives in Open and Distance Learning and Open Learning Resources'. *Distance Learning*, vol. 48, issue 1, 2010, pp. 16-22.

Hiltz, S., & Turoff, M., 'Education goes digital: the evolution of online learning and the revolution in higher education'. *Communications of the ACM*, vol. 48, issue 10, 2005, pp. 59-64.

Jarmon, L., Lim, K., & Carpenter, II, B., 'Introduction: Pedagogy, Education and Innovation in Virtual Worlds'. *Journal Of Virtual Worlds Research*, vol. 2, issue 1, 2009.

Kelton, A., 'Virtual worlds? Outlook good'. *EDUCAUSE Review*, vol. 43, issue 5, September/October 2008, pp. 16-22.

Masters, Y., & Gregory, S., 'Second Life: Harnessing virtual world technology to enhance student engagement and learning', in *Rethinking learning in your discipline*. University Learning and Teaching Futures Colloquium, Armidale, NSW, in press, 2010.

Puzziferro, M., & Shelton, K., 'Challenging Our Assumptions about Online Learning: A Vision for the Next Generation of Online Higher Education'. *Distance Learning*, vol. 6, issue 4, 2009, pp. 9-20.

Salmon, G., & Hawkridge, D., Editorial. *British Journal of Educational Technology*, vol. 40, 2009, pp. 401-413.

Schutt, S., & Martino, J., 'Virtual worlds as an architecture of learning', in *Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008*. 2008, pp. 900-902, <http://www.ascilite.org.au/conferences/melbourne08/procs/schutt-poster.pdf>

Short, J., William, E., & Christie, B., *The social psychology of communication*. New York: John Wiley, 1976.

So, H. J., & Bush, T. A., 'Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: relationships and critical factors'. *Computers & Education*, vol. 51, issue 1, 2008, pp. 318-336.

Warburton, S., 'Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching'. *British Journal of Educational Technology*, vol. 40, issue 3, 2009, pp. 414-426.

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In October, 2010, Sue and Yvonne were awarded an ALTC grant expanding on their research in virtual worlds.