Chapter 6: Conclusion
Conclusion

Introduction

The research this thesis, by journal-article format, was based upon was shaped by the researcher’s curiosity about the sustainability of virtual worlds for being engaging spaces in which to learn. Eleven peer-reviewed publications have been presented in this thesis which explore the efficacy of a virtual world as a teaching and learning tool by looking into impact on learning, engagement with learning and immersion in authentic learning activities. The research that has unfolded through the multiple and complex action research methodology has revealed virtual worlds are particularly valuable to students who are studying from a distance. The action research methodology, based on Kemmis and McTaggart (1988), drew on methods and analysis techniques described in full detail within the preceding chapters. Phase 1 of the research will be discussed briefly in this concluding chapter as the purpose of Phase 1 was to provide the reader with the context of the research which then informed Phase 2, which is discussed in more detail. The following table summarises the chapter and publication inclusions of each phase.

Table 6.1: Phase, chapter and publication summary

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<td>Chapter 2</td>
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This final chapter is divided into several sections. First, a recap of the research aims and objectives, second, key issues the research sought to answer, third, research findings and discussion and finally, the limitations and strengths of the overall study, implications for policy and practice, impact on the sector, future research directions and summary.

Recap of Research Aims and Objectives

The research aimed to investigate three areas. These were: impact on learning, engagement with learning and authentic learning in a virtual world. The key objective of the research was to investigate student perceptions of their learning in virtual world activities and a
consequential objective was whether these learning activities had an impact on improving learning outcomes.

**Key Issues**

The research focussed on three areas linked to adults learning in a virtual world. The researcher was initially curious about students’ learning in a virtual world and while the research questions for the publications naturally refined and evolved through the various action research cycles, as would be expected in this methodological approach, the following were starting points:

- Was increased engagement within authentic learning activities resulting in improved grades?
- Were the activities so immersive and engaging for students that they had an impact on student perceptions of their learning?
- Were learning activities in the virtual world authentic and like face-to-face learning activities?

The more specific questions that arose from these queries were (as outlined in Chapter 1):

*Action research cycle impact on learning*

Q1.1 How does learning in a virtual world impact on student learning outcomes?

Q1.2 What are student perceptions of their learning in a virtual world?

*Action research cycle engagement with learning*

Q2.1 How are students engaged with their learning in a virtual world?

Q2.2 What are student perceptions of their engagement with learning in a virtual world?

*Action research cycle immersion in authentic learning activities*

Q3.1 How does immersion in authentic learning activities impact on student learning?

Q3.2 What are student perceptions of their learning when immersed in authentic learning activities in a virtual world?
**Research Findings**

Between July 2008 and November 2011 research was undertaken exploring the efficacy of a virtual world as a teaching and learning tool. Results from this research have been shared in this thesis and with researchers and educators in various other publications, which can be found at [http://www.virtualclassrooms.info/papers.htm](http://www.virtualclassrooms.info/papers.htm). Action research was used to explore the impact on student grades across students, 523 of whom undertook the virtual world learning activities (239 on a voluntary basis and 284 on a compulsory basis). The perceptions of the impact on their learning of the 523 students who undertook the virtual world teaching activities were also measured. The students who participated in this research were diverse in their study path, studying one of seven units and coming together for various synchronous inworld activities.

As described in detail in Chapter 1, three research cycles were undertaken implementing action research as outlined by Kemmis and McTaggart (1988). These three research cycles were: impact on learning, engagement with learning and immersion in authentic learning activities. Three major findings emerged from the three research cycles.

1. **Student grades were significantly higher in the group who chose to participate in virtual world activities than those who chose not to, which included compulsory participation.**

2. **Students were engaged in their learning in virtual worlds and regularly lost track of time and could see the benefit of using a virtual world as a teaching and learning tool with their future students.**

3. **Students were immersed in authentic learning activities that were a replication of real-life activities and demonstrated that they could undertake these activities when real-world options were not available due to various constraints.** Examples of such activities included going on a tour to the Sistine Chapel to immerse oneself in the artwork of Michelangelo, visiting the U.S.A. National Space Station to navigate a rocket to a planet to learn important information pertinent to the planet or experience a glacier melting and the consequences of the rise in sea levels.

The research findings outlined in this thesis that underpin the major findings stated above are as follows. This is a recap of what was outlined in the introductory chapter as a courtesy for the reader.
• Virtual world learning activities had a direct impact on off-campus students because of their learning style and consequently they were able to see the benefit of this type of learning.
• Virtual worlds provided tools beyond the learning management system enabling off-campus students to participate in activities that were immersive and engaging.
• Virtual worlds provided students with an immersive and engaging learning environment that is almost like being in a face-to-face learning situation.
• Off-campus students found their experiences in virtual world learning activities were authentic when they were provided with the opportunity to participate where they would not normally be able to do due to distance, time and money.

More specific research findings from each chapter are now discussed. For each chapter an overview of the publications in the chapter is followed by the specific findings of each publication.

Chapter 2 – Context and Background
Chapter 2 provided context and background to the research and the findings presented support the research questions. The publications discuss the research that was to be undertaken, the types of virtual world activities that the students participated in and preliminary research findings about the engagement of students in the virtual world activities. The specific research findings from Publications 1, 2 and 3 are outlined below.

Publication 1: Research findings concluded that voluntary students who undertook the virtual world component of their studies were engaged when immersed in the content of their sessions. This publication does stress, however, that these students, voluntary participation through off-campus mode, are the types of students who may have been engaged in their learning activities no matter what activity they had chosen to do.

Publication 2: Research findings were that the simple model of gathering for discussions at the beginning and end of each session with various activities being undertaken in between by the students was engaging for students who participated voluntarily. Even the most skeptical amongst students found the approach to learning that was used to be engaging. It would potentially be impossible to implement this model of teaching and learning in a physical learning situation due to time and financial constraints.

Publication 3: Research findings demonstrated that to engage students in learning activities involving immersion in virtual worlds is effective. It appears that transformative and
constructivist learning approaches suit adult learners and this is consistent with andragogy principles.

Chapter 3 – Impact on Learning

Chapter 3 explored student grades from various aspects. The most significant finding from the two publications was that student grades were significantly higher for those students who voluntarily participated in virtual world activities compared to those who did not, including those who were required to participate. The specific research findings from Publications 4 and 5 are outlined below.

Publication 4: Research findings revealed a case for the use of transformative, constructivist and connectivism learning theories in relation to adults learning in a virtual world. Data analysis also indicated that students who volunteered to participate in virtual world activities achieved, on average, higher grades than those students who choose not to use virtual worlds for their learning. Furthermore, student perceptions of their learning were that they felt like they were in a face-to-face situation with their peers and educator. However, the students who opted to use virtual worlds may be motivated no matter how they study (Ostlund, 2008), and therefore findings here should be treated with the usual caution.

Publication 5: Research findings demonstrated that the grades of students participating on a voluntary basis in virtual world activities were significantly higher than those of students who chose not to. This trend was demonstrated across four years. The students who chose not to participate in virtual world activities were in the lower portion of grade results with approximately 70% of students who did participate on a voluntary basis receiving a grade of above 75%.

Chapter 4 – Engagement with learning

Chapter 4 investigated student perceptions of their learning in virtual world activities. The most significant finding from the two publications was that through the analysis of 52,000 lines of inworld text, surveys, observations and feedback, data suggested that those students who opted to undertaken virtual world activities were more engaged in their learning than not. The specific research findings from Publications 6 and 7 are outlined below.

Publication 6: Research findings concluded that students who participated in virtual world activities on a voluntary basis were engaged when attending these activities from an affective, behavioural or cognitive perspective. The analysis of text revealed contributions from students went beyond requirements in terms of time, depth and satisfying their learning
outcomes. It appears students may have stayed longer than the allocated time because they were more motivated by the learning activity. Many students also indicated that they wished to return to the virtual world in future teaching of the unit even though they were no longer enrolled at the university or in a unit that offered the virtual world activities. It is evident students valued the virtual world activities.

**Publication 7:** Research findings discovered that in comparing the experiences of on- and off-campus students that off-campus students were more engaged in their learning when attending virtual world activities than on-campus students. They stated this type of learning was like a face-to-face encounter and brought the off-campus students closer to “being there”. Conversely, on-campus students did not see the full potential a virtual world has to offer them in terms of teaching and learning. This possibly suggests that the isolation potentially felt by off-campus students is ameliorated through authentic immersive activities whereas on-campus students already experience such interactions.

**Chapter 5 – Immersion in Authentic Learning Activities**

Chapter 5 investigated role play activities in a virtual world and student perceptions of these activities. It was predominantly found that the off-campus students viewed the learning activities in a more positive light. However, on-campus students could see the benefit, particularly for their off-campus counterparts. The specific research findings from Publications 8, 9, 10 and 11 are outlined below.

**Publication 8:** Research findings produced evidence that real-world role plays can be simulated or replicated through immersing and engaging authentic virtual world activities. The results suggested on-campus students have a preference for real life, face-to-face learning activities, in other words, authentic learning activities. However, for off-campus students who do not have the opportunity for face-to-face activities, a virtual world role play is a viable substitute for real-life role play in an authentic and immersive setting.

**Publication 9:** Research findings were presented from the academics’ perspectives and found that a novice educator could teach in a virtual world with little training. Analysis of student perceptions of the role play activities supported this evidence.

**Publication 10:** Research findings revealed that when playing the role of teacher, student perceptions were that they were immersed in the virtual world learning activity. When playing the primary school student role they became bored and over-acted their role. The majority of students reported they were immersed in what was, for them, an authentic learning activity.
Off-campus students reported they could see how the activities could assist them in practising their teaching skills prior to embarking on teaching in a real classroom.

**Publication 11:** Research findings indicated all students who participated in the virtual world activities perceived the two role play activities (de Bono’s (1985) Six Thinking Hats and VirtualPREX) were authentic and immersive. The students believed that the authentic role plays enabled them to transfer the skills learned to their real life teaching and learning. They felt the activities were like a face-to-face encounter. The off-campus students were more able to put the experience in context for use as a resource in their future teaching and learning as opposed to the on-campus students who could see the role plays would be a valuable resource for off-campus students but not necessarily for themselves.

**Discussion**

Six research questions have been addressed in this thesis through three main themes: impact on learning; engagement with learning; and immersion in authentic learning activities. Following is a recap of the research strategies, context of the research, a discussion of the three themes presented in Chapters 3, 4 and 5, and finally some concluding comments.

The four years of research presented in this thesis was valuable as various groups of students provided a cross section of responses to address the research questions. A conceptual framework was developed following Andragogy principles, underpinned by transformative and constructivist learning theories. Action Research methodology was undertaken – a plan was developed, implemented, and observations and reflections on the activity were undertaken to provide feedback for further planning and implementation of the next cycle. Cycles were continuous over the four years incorporating increasing numbers of researchers and student participants into each cycle. Triangulation of data collection was extensive using various methods to identify the impact of student learning, student perceptions of their engagement whilst learning in a virtual world and how immersed students were in their authentic learning activities. The techniques used to analyse the data were through the use of various software and manual coding.

As the virtual world activities were conducted in a computer laboratory for on-campus students, the Internet connection and computers were of high quality. For those students who were studying in off-campus mode, students were encouraged not to participate if they were not able to experience a session without lag and rezzing issues and were encouraged to consider participating again when they had better quality Internet connection and computer.
Impact on learning

This theme was addressed in Chapter 3 where student grades were explored. The high impact on student grades may have been due to the increased motivation and engagement students experienced from participating in virtual world activities, or it could be that the types of students who chose to use virtual worlds for their learning may be the students who would typically receive higher grades than their peers. Alternatively, the students who chose to learn in a virtual world were so immersed in their learning that they worked harder at achieving the higher grade.

Learning and teaching in a virtual world brings students together where it becomes increasingly difficult to distinguish between the physical world and the virtual world. Students become immersed and engaged in their learning activities, particularly when the activities are authentic and have been simulated from real-life learning activities. The immersive environment and engagement of the users led to the success of virtual world classes, as found by Bowers et al. (2009). Off-campus students find the learning activities more engaging than on-campus students as they are experiencing the virtual world learning activity from a distance, making it much more real to them. These experiences have motivated the off-campus students (voluntary participants) to immerse themselves in their learning, and, as a consequence, they received significantly higher grades than those students who did not choose to learn through virtual world activities (including those required to participate).

Engagement with learning

This theme was addressed in Chapter 4 where student perceptions of their learning in virtual world activities was explored. The perceptions of students were that they were more motivated to participate in virtual world activities as they found the learning activities engaging. Student perceptions of their learning was broken down into the following themes: engagement, including feelings and beliefs (lost track of time as students were so involved in their virtual world learning activity, felt that the inworld activities were engaging or believed that the inworld activities were educational and engaging); communication (able to communicate via text and audio which seemed more immersive due to the appearance of an avatar than other “standard” types of communication such as a discussion board, chat room or email); anonymity (being able to provide a point of view without ridicule that can happen in a real world situation), learning (students were able to learning in a more immersive environment, found concepts easier to understand and enjoyed different types of activities that could be undertaken); distance (able to attend from any location worldwide); interaction
(being able to participate in virtual world activities with their peers and academic); collaboration (with peers when learning from different locations on tasks together); technology (both positive, such as ability to use technology to connect with others in an authentic setting, and negative, sometimes the technology did not work as planned); time (students regularly lost track of time); distance (where students could come together and it didn’t matter where they were located in the world); distractions (such as conversations with others could occur and others did not know about it, or there were so many different things to see and do so keeping on task may have been an issue), and other categories that did not fit into any of the above themes (such as discussions about replicating real life in a non-threatening environment).

It was also found, when exploring student perceptions of their learning and other data collected, that students were engaged in their learning when exploring affective, behavioural and/or cognitive engagement as found by Finger and Asun (2001), Jimerson, Campos, and Greif (2003), and Russell, Ainley, and Frydenberg (2005). Raeburn, Muldoon and Bookallil (2009) supported this finding with their own research, reporting that students find their experiences to be authentic and because of this, they are immersed in their learning activities. Overall, off-campus students provided more positive reflections on their learning than the on-campus students. This was because they were experiencing the engagement, immersion and authenticity of the virtual world activities from their own home as they did not have the opportunity for face-to-face learning. Students felt they were “there”, learning in a real, face-to-face encounter. There were many time zone issues to overcome to enable the synchronous activities to occur, but once there, students found the experience engaging.

**Immersion in authentic learning activities**

This theme was explored in Chapter 5 where student perceptions of role play activities in a virtual world were explored. The comparisons of authentic role play activities between off-campus and on-campus students found that most students were motivated by the role play and deeply engaged in their learning. Edwards et al., (2008) agree with this notion, stating that role-plays in a virtual world motivate and engage the learner. Two role play scenarios were provided to students – de Bono’s Six Thinking Hats role-plays and VirtualPREX role-plays. The first role play, where students were learning a teaching strategy that they could use in the classroom as future teachers, was created to immerse students in an environment so that it felt like they were participating in a real life activity. The second role play was designed so that students could practise their teaching skills in an activity that was as close to real life as
possible so as to provide an authentic learning experience. These virtual world activities provided opportunities for students to engage in productive interaction through the role-plays, in a digital learning environment that was authentic. For similar role play activities in a virtual world see Backe (2011) and for examples of authentic learning in a virtual world see Lombardi (2007). Feedback from students identified both role plays as authentic activities that were valuable to their learning and for their future teaching.

Throughout the thesis, the researcher has provided examples of immersive and engaging authentic virtual world learning activities that could be undertaken. There were a variety of activities used with the students and this provided students with ideas on how they could use a virtual world for their future teaching. As with many emerging technologies, the majority of students found the use of a virtual world for learning engaging and immersive. Consideration must always be given to the fact that these types of activities are not going to suit all learners. There should always be alternative activities provided for these students. This research always allowed for this and therefore the learning activities offered in the virtual world were not compulsory assessable tasks.

Following the research reported in this thesis, a more detailed comparison has been made between on-campus students and off-campus students (Gregory, in press). This comparison explored the differences in grades of students undertaking virtual world activities compared to those who did not. The comparisons were between study level (undergraduate and postgraduate), study location (where students were living whilst studying), gender, age, and the tools used for communication (such as Second Life and a chat room). Student perceptions of their learning were also discussed. Major findings from the research reported found that, regardless of enrolment (postgraduate or undergraduate), the students who chose to participate in virtual world activities outperformed those who chose not to. It also found that there was a decrease in the use of chat rooms for communication and a significant increase in the use of a virtual world for communications.

In summary, the learning environment, or the learning activities undertaken by the students, discussed in this thesis were engaging for the learner. Students were immersed in their activities. They found them authentic, some likening them to real world activities and face-to-face encounters and some feeling like they were there, in real life, with the other participants. Student grades were higher for those who voluntarily participated in the activities. The eleven publications presented in this thesis address the research questions proposed and highlight ideas for further research that could be undertaken.
Limitations of the Overall Study

A limitation to the overall study was that the researcher is yet to verify why the impact of learning in virtual worlds on student learning was significant. This is discussed more fully in Publications 4 and 5. While there were consistent trends across the four years, that those students who chose to use a virtual world for their learning had significantly higher grades than those who chose not to including required participation, it was not determined why this was so. Although this research explored results of both off-campus students and on-campus students across all units that used virtual worlds as a teaching and learning tool, the grades comparison was only made between those students who attended virtual world activities on a voluntary basis compared to those who chose not to (this group included on-campus students). Analysis has been undertaken to compare the grades of on-campus students (required participation) to the grades of students who chose not to participate in virtual world activities. Students who attended compulsory activities (on-campus students) did not experience the same immersion in weekly sessions as the voluntary participants (off-campus students). The on-campus students only experienced a maximum of four hours in virtual world activities as compared to off-campus students who attended weekly sessions for 13 weeks (sessions going for approximately two hours each, totalling approximately 26 hours). The impact on the off-campus student grades for those attending virtual world activities was significant and requires further exploration.

Another limitation to the study was that the researcher might not have explored all avenues of the research. As an example, analysis comparing the grades of those students who chose not to participate in virtual worlds activities to the grades of on-campus students through compulsory requirement to participate found the results were not significant. This also requires further exploration.

One limitation that should be considered in relation to this research is the Hawthorne Effect. The Hawthorne Effect is “that behaviour during the course of an experiment can be altered by a subject’s awareness of participating in the experiment” (Jones, 1992, p. 451). Only off-campus conversations were recorded and students agreed to have all conversations recorded, as per Ethics requirements, at the beginning of the semester. Therefore, the Hawthorne Effect may not have been relevant later in the semester as students may have forgotten that what they said during the virtual world activities was being recorded.
Finally, the researcher was intimately involved in the research and there will, of course, be researcher bias. However, every endeavour was taken to eliminate this bias.

**Strength of the Overall Study**

This research was conducted over a four-year period to provide an opportunity to evolve and test ideas. There were four main strengths to this research. First, the use of action research enabled the research to be verified and replicated. Second, students were provided with the opportunity to undertake virtual world activities. Third, the research was verified as significant through the receipt of an award and grants from governing bodies. Finally, the inclusion of more educators to undertake the research enabled different expertise, skills, ideas and methods to emerge and be implemented. The four strengths are now discussed in more detail.

Action research allows the researchers to evolve and develop a deeper understanding of the issues through cycles. This research was strengthened by the use of action research as the researcher/s evaluated the data collection and analysis to ensure the research was continuously reviewed and improved prior to the next iteration, as per action research principles. The researchers used various data collection approaches to ensure action research principles were followed. As the different cycles were repeated over the years, a major strength of the research is that the data collection and analysis was verified and, where necessary, reconstructed and re-implemented to improve the collection methods and analysis.

A further strength was that the researcher in 2009, through changed work responsibilities, was able to provide students with the opportunity to learn through virtual world activities. The researcher did, however, ensure that students only participated if they had suitable hardware/Internet connection and wanted to experience this type of learning. If the student was struggling with his/her studies, it was suggested that this type of learning may not be suitable for him/her as it required extra commitment in terms of time and understanding (cognitive load). If the technology was not of a suitable standard (i.e., the computer was not performing as it should, such as items were not coming into focus quickly, rezzing, or there was slowness, lag) it was proposed that the student try this type of learning at a later stage when he/she had sufficient technology so that he/she received the full experience of learning in this manner. To prevent bias in the student grades, the researcher ensured, where possible, that students who participated in virtual world activities had their assessment tasks marked by other educators. Of the 523 students who participated in the research, the researcher only marked 30 student assessment tasks as she was the only educator teaching in the unit. The fact
that other educators marked students’ assessment tasks was a real strength of the research as it removed biases.

Sample size was a significant strength of the research. The number of students who were part of this research was substantial, with a total of 523 students undertaking virtual world activities and 3,576 grades being analysed.

Finally, consistent with action research methodology, the inclusion of more researchers enabled different expertise, skills, ideas and methods to emerge and be implemented and thus strengthened the research. The addition of these researchers enabled them to contribute their knowledge and expertise to ensure sound research data collection and analysis were undertaken. They also contributed to the dissemination of the results of the research. Most importantly, the higher education sector recognised the value of the research by awarding national research grants and a citation for the researcher as outlined in more detail below.

**Implications for Policy and Practice**

The main implication of the research findings outlined in this thesis is that virtual worlds provide a space for learners who are unable to attend a face-to-face learning environment where they can experience authentic, immersive and engaging learning activities. There are some significant implications of these findings for organisations across sectors that might consider using virtual worlds. These should include changes to policy and procedures when incorporating virtual worlds into their practice, relating to:

- Appropriate infrastructure support including hardware updates;
- Suitable virtual world space in which to teach and for students to learn;
- Technical help and assistance for those using virtual worlds;
- Professional development for educators and students;
- Clear guidelines for educators and students for teaching and learning in virtual worlds;
- Transparent understanding of the commitment required by those embarking on teaching and learning in virtual worlds;
- A sustainability plan to cater for the transient nature of educators;
- Sufficient budgetary requirements to ensure ongoing virtual world availability; and
- Appropriate policy and procedures for operating virtual worlds.
Impact on the Sector

The value of this research has been verified in the sector. The research was verified as significant through peer-review over the years in relation to publications, teaching awards and funding grants, which was a major strength of the research. As peers verified the validity of the researcher, this assisted her in gaining a Faculty Award for Excellence in Learning and Teaching in 2011 and an OLT citation in 2012, “Innovative adaptation and expansion of virtual world technology to enhance learning and teaching in education and across disciplines” for her research and teaching in virtual worlds. Another verification of the significance of the research is that the researcher has been the recipient of three OLT grants (one as a lead) since 2010 due to her research in virtual worlds. These research projects are: “VirtualPREX: Innovative assessment using a 3D virtual world with pre-service teachers” (Project Lead), “Design as a catalyst for engaging students in creative problem solving” and “Development of an authentic training environment to support skill acquisition in logistics and supply chain management”. The researcher also became the inaugural Chair of the Australian and New Zealand Virtual Worlds Working Group (VWWG) in 2009 and has remained in this position. Again, this demonstrates that the researcher’s peers deem her standard of research and leadership worthy of her being in these roles. The OLT citation, grants and the position of Chair of the VWWG indicate that the researcher and consequent research has had an impact on the sector and has been recognised as significant.

Future Research Directions

It is recommended that further empirical and applied research be undertaken to determine the efficacy of a virtual world as a teaching and learning tool. Evidence suggests that the hype of teaching in virtual worlds is diminishing with some educators opting out of using them as a teaching and learning tool (Gregory et al., 2012). However, this thesis has demonstrated, through student perceptions of their learning, that virtual world activities in authentic settings are engaging and immersive and can have an impact on student achievement. Further research could be undertaken to determine whether learning activities in a virtual world are motivating students to achieve in their studies, or if it is the use of cutting-edge technologies being offered by committed and reflective teachers are assisting students to achieve higher grades.

The future in relation to virtual world education is unknown. However, it does provide the opportunity for educators to experience teaching in non-traditional ways such as outlined in
this thesis. These teaching methods provide the educator with a tool that can support student learning.

There are many opportunities in the field of virtual world education for further research. Almost any area of research could be undertaken in a virtual world. For example, research about the development of skills, competencies and graduate attributes undertaken virtually would be worthwhile in the current Federal Government policy environment which is seeking verification and evidence of students’ abilities in these areas. Research into social presence in a virtual world, accessibility issues or using other virtual world platforms are further areas of research that must be addressed. Cross discipline and cross institution research should be undertaken to verify the validity of virtual worlds as a teaching and learning tool. The results and findings of other researchers should be disseminated to ensure that those wishing to take up research, teaching and learning in a virtual world could easily do so.

Most experimentation, simulation, role play, teaching and learning that are undertaken in a face-to-face situation can be undertaken in a virtual world and therefore could be explored from differing disciplinary contexts.

**Summary**

This final chapter has provided an overview of the key issues, findings, implications, limitations, strengths, impact and possible further research areas for educators wishing to use a virtual world as a research, teaching and learning tool. The action research methodology proved a worthy approach for investigating the impact of learning within a virtual world. Developing a thesis through the presentation of a series of publications has been beneficial as it enabled the researcher to seek peer feedback to inform the ongoing research. The main finding is that virtual worlds are particularly valuable to students who are studying from a distance. Learning activities that are immersive and authentic do appear to be more engaging for the student and this has had an impact on student learning as has been described, analysed and developed within the eleven publications presented.


References

Beach, R., & Doerr-Stevens, C. (2009). Learning argument practices through online role-play: Toward a rhetoric of significance and transformation. *Journal of Adolescent & Adult Literacy, 52*(6), 460–468. doi:10.1598/JAAL.52.6.1


References


References

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References


References


University. Retrieved from https://sites.google.com/a/boisestate.edu/edtechtheories/emerging-theories-and-online-learning-environments-for-adults-1


Appendices

Appendix A – Survey 1

Online Survey – pre semester – Publications 1 and 5

General ICT Skills/Usage

Email address: 

For alignment of data purposes only

Please select the most appropriate answer

A General

Male ☐, Female ☐

Age: up to 20 yrs ☐, 21 to 29 ☐, 30 to 45 ☐, 46 to 59 ☐, 60+ ☐

My place of residence during the semester is: metropolitan ☐, city and hinterland ☐, town and surrounds ☐, rural or remote ☐

How would you rate your skill level with ICT in general

Very high ☐ high ☐ average ☐ low ☐ very low ☐

B Technical – how often do you use these tools? Tick the category that is applicable to you at the moment. If you don’t understand a question or have not heard of the tool, please leave blank.

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<td><strong>Please state which ones</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Discussion Boards</strong></td>
<td></td>
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<tr>
<td><strong>Please state which ones</strong></td>
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<tr>
<td><strong>Social networking (e.g., MySpace, Facebook)</strong></td>
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<tr>
<td><strong>Please state which ones</strong></td>
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<tr>
<td><strong>Phone calls (e.g., VoIP using Skype)</strong></td>
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<tr>
<td><strong>Games (networked) (e.g., World of Warcraft, Maple Story)</strong></td>
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<tr>
<td><strong>Please state which ones</strong></td>
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</tr>
<tr>
<td><strong>Virtual Worlds (e.g., There, Second Life, Active Worlds, VastPark, Lively)</strong></td>
<td></td>
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<tr>
<td><strong>Please state which ones</strong></td>
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</tr>
</tbody>
</table>
Appendix B – Survey 2

Online Survey – post semester – Publications 1 and 5

General Questions to all participants

Email address: 

For alignment of data purposes only

Please select the most appropriate answer

Which of the following tools did you use during the semester in your studies? If you don’t understand a question or did not use the tool, please leave blank.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Daily</th>
<th>Several times a week</th>
<th>Several times a month</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>General websites/Net surfing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give a brief description of how</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Webinars</td>
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<tr>
<td>Give a brief description of how</td>
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</tr>
<tr>
<td>Video Conferences</td>
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<tr>
<td>Give a brief description of how</td>
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<tr>
<td>Blog</td>
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<tr>
<td>Which ones were used?</td>
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<td></td>
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<tr>
<td>Give a brief description of how</td>
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<tr>
<td>Wiki</td>
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<tr>
<td>Which ones were used?</td>
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<tr>
<td>Give a brief description of how</td>
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<tr>
<td>Podcasts</td>
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<tr>
<td>Give a brief description of how</td>
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<tr>
<td>Chat rooms</td>
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<tr>
<td>Give a brief description of how</td>
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<tr>
<td>Which ones were used?</td>
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<tr>
<td>Discussion Boards</td>
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<tr>
<td>Which ones were used?</td>
<td></td>
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<tr>
<td>Give a brief description of how</td>
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<tr>
<td>Virtual Worlds</td>
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</tr>
</tbody>
</table>
Please select the most appropriate answer

Give a rating of your opinion of the tool used. If you don’t understand a question or did not use the tool, please leave blank.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Fantastic tool, will use regularly (several times a week)</th>
<th>A fairly good tool, will use occasionally (about once a week)</th>
<th>The tool was okay, will use every now and then (monthly)</th>
<th>Didn’t like the tool, will rarely use or didn’t find useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>General websites/Net surfing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Webinars</td>
<td></td>
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<tr>
<td>Video Conferences</td>
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<td>Blog</td>
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<td>Wiki</td>
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<tr>
<td>Podcasts</td>
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<tr>
<td>Chat rooms</td>
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<tr>
<td>Discussion Boards</td>
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<tr>
<td>Virtual Worlds</td>
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</tr>
</tbody>
</table>

Please select the most appropriate answer

Give a rating of your perceived knowledge gained throughout the semester from the use of these tools. If you don’t understand a question or did not use the tool, please leave blank.

<table>
<thead>
<tr>
<th>Tool</th>
<th>I feel I understand how to use this tool without assistance</th>
<th>I could use this tool with a little assistance</th>
<th>I could use this tool but require substantial assistance</th>
<th>I still have no idea how to use this tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>General websites/Net surfing</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Webinars</td>
<td></td>
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<tr>
<td>Video Conferences</td>
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<td>Blog</td>
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<tr>
<td>Wiki</td>
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</tr>
</tbody>
</table>
Did you work with fellow students whilst studying this course? If so, please tick the tool used and give a brief description of how you worked together.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>How did you use the tool with a fellow student?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>General websites/Net surfing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Webinars</td>
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<td></td>
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<td>Video Conferences</td>
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<td>Podcasts</td>
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<td>Chat rooms</td>
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<td></td>
<td></td>
<td>Discussion Boards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Virtual Worlds</td>
</tr>
</tbody>
</table>
Extra survey questions only to those students who opted to use a virtual world for their studies

General Questions about your Experiences using the virtual world as an educational environment

ID: 

Please select the most appropriate answer. If you don’t know or understand the answer, please leave blank.

Please tick the appropriate answer

1. How long have you been using a Virtual World (other than for this course)?
   
   - >2 years
   - 1 to 2 years
   - 6 months to 1 year
   - < 6 months
   - never

2. How long have you been using the virtual world of Second Life (other than this course)?
   
   - >2 years
   - 1 to 2 years
   - 6 months to 1 year
   - < 6 months
   - never

3. What was your knowledge of Second Life prior to this semester’s study?
   
   - Very high
   - high
   - average
   - limited
   - very low (or non existent)

4. Where you given enough instructions to be able to operate your avatar?
   
   - Good instructions
   - reasonable instructions
   - average
   - low
   - very low

5. How many hours did you need to be in the virtual world before you felt comfortable in getting around?
   
   - Less than 1 hour
   - 1–2 hours
   - 3–4 hours
   - greater than 4 hours
   - didn’t every feel comfortable using the virtual world

6. How would you rate the difficulty level when first learning to use the virtual world?
   
   - Very easy
   - easy
   - difficult
   - very difficult
   - extremely difficult

7. Where you able to change (Edit) your appearance quickly and easily?
   
   - Very easy
   - high
   - average
   - low
   - very low

8. Are you comfortable with how your avatar looks (hair, shape, skin)?
   
   - Very comfortable
   - comfortable
   - average
   - low
   - very low

9. Did you find out how to change these things yourself?
   
   - Yes
   - No

10. Are you comfortable with how your avatar dresses?
    
    - Yes
    - No

11. How many items do you have in your inventory?

    Number

12. How many additional folders have you set up?

    Number
13 Did you make any friends in Second Life (other than lecturer/fellow students)?
   Yes ☐ No ☐
14 If so, how many (have a look in your friends list – how many are there)?
   Number ☐
15 Tell me how you made friends with people
16 Were you easily able to save a landmark and revisit a location that you wanted to?
   Yes ☐ No ☐
17 Were you able to search for information easily?
   Very high ☐ high ☐ average ☐ low ☐ very low ☐
18 Were you able to find the answers to the questions posed by the lecturer quickly and easily?
   Always ☐ often ☐ average ☐ not very well ☐ rarely ☐
19 Were you comfortable in using this environment to carry out tasks?
   Very comfortable ☐ comfortable ☐ average ☐ mildly comfortable ☐ not comfortable ☐
20 Were you able to find the tools that were requested quickly and easily?
   Very easily ☐ easily ☐ average ☐ not easily ☐ couldn’t find them ☐
21 Were you able to use the tools that you gathered?
   Always ☐ often ☐ average ☐ not very well ☐ rarely ☐
22 Did you talk to people often in “Local Chat”?
   Very often ☐ often ☐ average ☐ not often ☐ rarely ☐
23 Did you talk to people in “IM” – Instant Message?
   Very often ☐ often ☐ average ☐ not often ☐ rarely ☐
24 Did you ever receive messages when you were offline?
   Very often ☐ often ☐ average ☐ not often ☐ rarely ☐
25 How often?
   Daily ☐ twice a week ☐ weekly ☐ less than weekly ☐ never ☐
26 Did you use the “voice tools” and carry out audio conversations with people (similar to Skype)?
   Very often ☐ often ☐ average ☐ not often ☐ rarely ☐
27 If so, were they near you (i.e., could you see them)?
   Yes ☐ No ☐
28 Did you talk to people using audio features when you weren’t near each other?
   Very often ☐  often ☐  average ☐  not often ☐  rarely ☐
29 How often did you discuss unit materials with students when the Lecturer wasn’t present?
   Very often ☐  often ☐  average ☐  not often ☐  rarely ☐
30 To what extent did the scheduled activities support your learning?
   Quite a lot ☐  a fair amount ☐  a fair amount ☐  not much ☐  not much at all ☐
31 Did you listen to music – “Play Streaming Music”?
   Very often ☐  often ☐  average ☐  not often ☐  rarely ☐
32 Did you view media – “Play Streaming Media”?
   Very often ☐  often ☐  average ☐  not often ☐  rarely ☐
33 Did you watch any slide show presentations?
   Very often ☐  often ☐  average ☐  not often ☐  rarely ☐
34 Were you able to zoom in to view something that was far away?
   Yes ☐  No ☐
35 Were you able to save discussions?
   Yes ☐  No ☐
36 Did you attend any SL classes?
   Daily ☐  twice a week ☐  weekly ☐  less than weekly ☐  never ☐
37 Did you have building/scripting skills prior to this semester’s study?
   Yes ☐  No ☐
38 If so, which ones

39 Did you “building” anything when on SL?
   Yes ☐  No ☐
40 If so, what?

41 If yes, what was your skill level? [Advanced – you could build a house with several rooms] [Low
   – you could create a box and change the colour] (If no, leave blank)
   Advanced ☐  reasonably good ☐  average ☐  low ☐  limited ☐
42 Did you change any scripts?
   Yes ☐  No ☐
42 If so, which ones and how?
43 If yes, what was your skill level? [Advanced – you could write a script for your avatar to walk with a limp and use a walking stick] [Low – you could add a sit script to a pose ball] (If no, leave blank)

Advanced ☐ reasonably good ☐ average ☐ low ☐ limited ☐

44 Did you visit any other educational institution’s Second Life campuses?

Yes ☐ No ☐

45 If yes, which ones, please list.

46 If yes, what did you do there?

47 Did you use any of the following tools (whilst in Second Life)?

47a Blogs

Yes ☐ No ☐

47b Video stream

Yes ☐ No ☐

47c Slide shows (like PowerPoint)

Yes ☐ No ☐

47d Quizzes

Yes ☐ No ☐

47e Any other – please list

48 Did you enjoy using Second Life as an educational tool?

Yes ☐ No ☐

49 Will you continue to use a virtual world after the completion of this unit?

Yes ☐ No ☐

50 Please briefly expand on your answer

51 Please write a short statement about your general impressions of using Second Life as an educational tool
52 Will you continue to use a virtual world after the completion of this unit?

Yes ☐  No ☐

Please briefly expand on your answer to both questions 54 and 55 above

53 Please write a short statement about your general impressions of using a virtual world as an educational tool


Appendix C – Survey 3

Online Survey – Publications 4, 6 and 7

The Impact of Student Interaction with Online Tools

1. Welcome

The purpose of this survey is to discover your views on the impact of online tools for interaction during this semester. You received the information sheet about this survey at the start of semester.

Participation in this survey is voluntary. Completing and submitting this survey gives your consent to this part of the research. If you do not wish to participate in the research, please leave this site and do not continue any further.

2. Thank You for Continuing

Thank you for completing this survey.

As explained in your information letter and on the first page, this survey is voluntary.

The survey should take you between 10 and 15 minutes to complete. Questions marked with an * require an answer.

Should you decide that you do not wish to continue participating at any time during the survey, close your browser and the data will not be saved.

Once you reach the end of the survey and click the 'done' button, your answers will be saved and will be visible to us.

Thank you again for assisting us, Sue and Yvonne.

3. General Information

This page requires some background information about you.

* 1. Name:

* 2. Age:

  - Under 18
  - 18 - 24
  - 25 - 34
  - 35 - 44
  - 45 - 54
  - 55 and over

* 3. Gender:

  - Male
  - Female

4. General Information 2
* 4. Location of residence while studying:
   - Rural - living on land/property
   - Rural town - > 5000 people
   - Small Regional town/city - 5000 - 18000
   - Small Non-Regional town/city - 5000 - 18000
   - Regional City 18000 - 50000
   - Non-Regional City 18000 - 50000
   - Regional Major City - 50000 - 250000
   - Non-Regional Major City - 50000 - 250000
   - Capital City

5. Pre-UNE ICT Experience

This page requires some background information about your ICT experience prior to your UNE studies.

* 5. How would you rate your skill level with ICT in general?
   - Very high
   - High
   - Average
   - Low
   - Very low
The Impact of Student Interaction with Online Tools

6. How often did you use these tools prior to your studies at UNE? Tick the category that is applicable to you. If you do not understand a category or have not heard of the tool please select N/A.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Daily</th>
<th>Several times a week</th>
<th>Several times a month</th>
<th>Infrequently</th>
<th>Never</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>General computer use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile phone</td>
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<td></td>
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<tr>
<td>Internet surfing</td>
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<tr>
<td>Webinars</td>
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<tr>
<td>Video conference</td>
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<tr>
<td>Blogs</td>
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<tr>
<td>Wiki</td>
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<tr>
<td>Podcast</td>
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<tr>
<td>Chat rooms</td>
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<tr>
<td>Discussion boards</td>
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<td></td>
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<tr>
<td>Social networking (e.g., Facebook, Twitter)</td>
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</tr>
<tr>
<td>VoIP (e.g., Skype)</td>
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</tr>
<tr>
<td>Networked games (e.g., World of Warcraft)</td>
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<td></td>
</tr>
<tr>
<td>Virtual worlds (e.g., Second Life, Reaction Grid, Club Penguin, BarbieWorld)</td>
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</tr>
</tbody>
</table>

Please specify the particular tool in any category

6. Post-Unit Perceptions of Online Interaction Tools

This page requires you to provide your perceptions of the online tools for interaction that you used in this unit of study.

7. Did you use Second Life for discussions?

- Yes
- No
8. If you used Second Life for discussion please answer this section with reference to Second Life only. If you did not use Second Life, please answer with reference to Sakai’s discussion board.

Please rate each category below with reference to ease of use and also impact on learning.

<table>
<thead>
<tr>
<th>Ease of Use</th>
<th>Impact on Your Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicating with your lecturer</td>
<td></td>
</tr>
<tr>
<td>Communicating with other students</td>
<td></td>
</tr>
<tr>
<td>Socialising with other students</td>
<td></td>
</tr>
<tr>
<td>Learning concepts</td>
<td></td>
</tr>
<tr>
<td>Organising the group reading response</td>
<td></td>
</tr>
<tr>
<td>Group dynamics</td>
<td></td>
</tr>
<tr>
<td>Group Leadership</td>
<td></td>
</tr>
<tr>
<td>Allocation of roles within the group</td>
<td></td>
</tr>
<tr>
<td>Enhancing your own learning</td>
<td></td>
</tr>
</tbody>
</table>

Please make additional comments here.

7. Post-Unit Perceptions of Online Interaction Tools 2

9. Please write a short statement about your general impressions of using the online communication tool discussed in the last question for your learning in this unit.
The Impact of Student Interaction with Online Tools

10. Please tick the relevant button for each question.

<table>
<thead>
<tr>
<th>How much effort did I put into my learning?</th>
<th>Very high</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Very low</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>How interested was I in what I was learning?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How engaged was I in what I was learning?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Please explain your responses

8. You have completed the survey.

Thank you for completing the survey.

To submit your responses, please click the 'Done' button.
Appendix D – Survey 4

Online Survey – Publications 2, 8, 9 and 11

Student Survey – Real Life – *Please answer the following:*

<table>
<thead>
<tr>
<th>Your Name</th>
<th>Group</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Avatar Name**

*General Question* – 1 Male ☐, Female ☐

*In relation to Edward deBono’s workshop on 6 Hats, please tick the relevant box*

2 How much effort did I put into my learning?

<table>
<thead>
<tr>
<th>I didn’t put in any effort</th>
<th>I didn’t put in very much effort</th>
<th>I put in some effort</th>
<th>I put in lots of effort</th>
<th>I put in as much effort as I could</th>
</tr>
</thead>
</table>

3 How interested was I in what I was learning?

<table>
<thead>
<tr>
<th>I was not interested at all</th>
<th>I was a bit interested</th>
<th>I was interested</th>
<th>I was very interested</th>
<th>I was really interested</th>
</tr>
</thead>
</table>

4 How engaged was I in what I was learning (i.e., did it work as a lesson)?

<table>
<thead>
<tr>
<th>I was rarely engaged</th>
<th>I was occasionally engaged</th>
<th>I was engaged</th>
<th>I was mostly engaged</th>
<th>I was always engaged</th>
</tr>
</thead>
</table>

5 How difficult did you find the concept to understand?

<table>
<thead>
<tr>
<th>Extremely challenging</th>
<th>Challenging</th>
<th>Not too bad</th>
<th>Easy</th>
<th>Very easy</th>
</tr>
</thead>
</table>

6 Please write a short statement about your general impressions of using de Bono’s Six Thinking Hats

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>


Student Survey – Second Life – Please answer the following:

Your Name

Group

Date

Avatar Name

General Questions about your experience using Second Life

1 How would you rate your skill level with ICT in general
   Very high ☐ high ☐ average ☐ low ☐ very low ☐

2 Have you used Second Life before (other than sessions for UNE)?
   Yes ☐ No ☐

3 Have you used Second Life for educational purposes before?
   Yes ☐ No ☐

4 Have you attended any Second Life classes before (other than for UNE)?
   daily ☐ twice a week ☐ weekly ☐ less than weekly ☐ never ☐

5 Did you enjoy using Second Life™ as an educational tool?
   Yes ☐ No ☐
   Please briefly expand on your answer

6 Please write a short statement about your general impressions of using Second Life as an educational tool
Appendix E – Survey 5

Online Survey – Publications 10 and 11

VirtualPREX Survey 1
(for completion immediately following the in class virtual worlds role-play activity)

Online Survey

Welcome

Thank you for agreeing to take part in this survey.

Project Aims:

As part of this study we wish to survey students enrolled in UNE EDIT 124 about their perceptions of teaching in a school and Second Life™ as an educational tool. We would like to take this opportunity to invite you to complete a survey. Your participation is voluntary and you are free to cease participation at any time. The survey is anonymous and should take approximately fifteen (15) minutes to complete. For the purpose of matching survey results, you will be required to use your name, which will later be de-identified. From the data collected in this survey we hope to achieve the following:

• Assist students in acquiring a better range of professional skills and confidence before being placed in a real life classroom.
• Provide diverse professional experience options for students.
• Create awareness about virtual worlds as a pedagogical and social networking tool.
• Compare different methods of interaction to enhance student learning and teaching.

Contact Details

Sue Gregory

ICT Lecturer, School of Education

University of New England

Armidale

02 6773 5054

sue.gregory@une.edu.au

[NEXT PAGE]
Participant Consent

I understand that by clicking the submit button on the online survey indicates that:

I (the participant) have read the information contained in the Information Sheet for Participants and any questions I have asked have been answered to my satisfaction. I agree to participate in the online survey, realising that I may withdraw at any time. I understand that research data gathered for the study will be published and give my consent for it to be used in this manner provided my name is not used or I am not identifiable in any regard.

This project has been approved by the Human Research Ethics Committee of the University of New England (Approval No. .........., Valid to .../.../...)

Should you have any complaints concerning the manner in which this research is conducted, please contact the Research Ethics Officer at the following address:

Research Services
University of New England
Armidale, NSW 2351
Telephone: (61 2) 6773 3449 Facsimile (61 2) 6773 3543
Email: ethics@une.edu.au

Participation in this survey is voluntary. Completing and submitting this survey gives your consent to this part of the research. If you do not wish to participate in the research, please leave this site and do not continue any further.

In this survey, a virtual world is an online electronic presence that imitates real life in the form of a personal presence through someone’s avatar (the alter ego which is a graphical representation of themself in the virtual world).
Thank you for continuing and completing this survey

As explained on the first page, this survey is voluntary.

The survey should take approximately 15 minutes to complete. Questions marked with an * require an answer.

Should you decide that you do not wish to continue participating at any time during the survey, close your browser and the data will not be saved.

Once you reach the end of the survey and click the ‘done’ button, your answers will be saved and will be visible to the VirtualPREX team.

Thank you again for assisting us, Sue Gregory, Yvonne Masters, Barney Dalgarno, Heinz Dreher, Matthew Campbell, Geoff Crisp and Torsten Reiners
A. Demographic Information

Please select the most appropriate answer:

*Name:

*Age:
- ☐ under 26 yrs
- ☐ 26 to 35
- ☐ 36 to 45
- ☐ 46 to 55
- ☐ 56 to 65
- ☐ Over 65

*Gender
- ☐ Male
- ☐ Female

My place of residence when not attending university is:
- ☐ Rural – living on land/property
- ☐ Rural Town – less than 5000 people
- ☐ Small Regional Town/City – 5000–18000 people
- ☐ Small Non-Regional Town/City – 5000–18000 people
- ☐ Regional City – 18000–50000 people
- ☐ Non-Regional City – 18000–50000 people
- ☐ Regional Major City – 50000–250000 people
- ☐ Non-Regional Major City – 50000–250000 people
- ☐ Capital City – 50000++ people

*The postcode of my place of residence during the semester is: ________________

*Academic Year (eg. Year 1, Year 2, Year 3 or Year 4 of your course): ________________
7  *Course enrolled in:_____________________

8  *Institution:_____________________________________________________

9  *Faculty/School/Department:________________________________________

B. ICT Skills and Experience

10  *How would you rate your skill level with respect to ICT in general worlds prior to commencing your university studies?

   □ Very high
   □ High
   □ Average
   □ Low
   □ Very low

11  *How would you rate your skill level with respect to virtual worlds prior to commencing your university studies?

   □ Very high
   □ High
   □ Average
   □ Low
   □ Very low

12  *How often do use the following tools? Tick the category that is applicable to you at the moment. If you don’t understand a question or have not heard of the tool please select N/A.

<table>
<thead>
<tr>
<th>Technology/Applications</th>
<th>Daily</th>
<th>Several times a week</th>
<th>Several times a month</th>
<th>Infrequently</th>
<th>Never</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Internet in general</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smartphone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social networking (eg MySpace, Facebook, Twitter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please state which ones you use regularly*  |
Networked Games (eg World of Warcraft, Maple Story) | ☐ ☐ ☐ ☐ ☐ ☐ ☐

Please state which ones you play regularly

Other 3D Games | ☐ ☐ ☐ ☐ ☐ ☐ ☐

Please state which ones you play regularly

Virtual Worlds (eg Second Life, Active Worlds, Open Sim, Club Penguin, Barbie World) | ☐ ☐ ☐ ☐ ☐ ☐ ☐

Please state which ones you use regularly

C. Views and beliefs about virtual worlds for learning and teaching

13 *Please rate the importance of each of the following learning benefits of virtual worlds.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Extremely Unimportant</th>
<th>Very Unimportant</th>
<th>Unimportant</th>
<th>Neutral</th>
<th>Important</th>
<th>Very Important</th>
<th>Extremely Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. They can assist learners in developing familiarity with a place and the objects within it.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. They can be motivating and engaging for learners.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. They can lead to improved transfer of learning to real situations.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. They can enable more effective collaborative learning.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. They can allow learners to learn through experience in context.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D. Evaluation of the virtual worlds role-play activity

14 Which of the following roles did you carry out during the virtual worlds role-play activity (tick all that you carried out)?

☐ Teacher
☐ Student
15 Please use the rating scales below to give an overall rating of the virtual worlds role-play activity you undertook in your workshop.

<table>
<thead>
<tr>
<th></th>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Difficult</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Irrelevant</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Interesting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Easy to use</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Useful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Boring</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Enjoyable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

16 Did you have any technical problems with the virtual worlds role-play activity?

☐ Yes

☐ No

If yes, what were these problems and how did you resolve them?

---------------------------------------------------------------------------------------------------

---------------------------------------------------------------------------------------------------

---------------------------------------------------------------------------------------------------

17 Aside from technical issues, did you have any problems undertaking the virtual worlds role-play activity?

☐ Yes

☐ No

If yes, what were these problems and how did you resolve them?

---------------------------------------------------------------------------------------------------

---------------------------------------------------------------------------------------------------

---------------------------------------------------------------------------------------------------

---------------------------------------------------------------------------------------------------
18. What was the best thing about the activity?

[Blank]

19. What was the worst thing about the activity?

[Blank]

20. What is one thing about the activity that could be done differently to improve it?

[Blank]

21. Do you believe that the virtual worlds role-play activity was helpful in preparing you for your upcoming professional experience placement? If so, in what way? If not, why not?

[Blank]

22. Would you like to receive a copy of the final report for VirtualPREX, when it becomes available in December 2012?

☐ Yes

☐ No
Glossary of Terminology

Adult Learning Theories

Documented researched theories on how adults learn.

Anonymous

Anonymity is remaining unknown.

Asynchronous and Synchronous

Online tools are either asynchronous or synchronous (Dabbagh & Bannan-Ritland, 2005). Forums are a form of asynchronous communication. A message is posted to the forum and, when the other person reads the posting, they respond. This is typically minutes/hours/days or even weeks later. This form of communication encourages the person to reflect on their response (Woodman, 2003). Synchronous means “at the same time” such as talking to someone via Skype in real time, i.e. live. There is a person at a computer somewhere talking to another person at a computer somewhere else “at the same time”. They talk to each other via video, audio or text and are online simultaneously.

Anytime Resources

Anytime resources are resources that are available at anytime during the day or night, every day.

Anywhere/Anytime

Anywhere/anytime refers to the ability to participate in elearning at any time, 24 hours a day, seven days a week from any place in the world with Internet access.

Asynchronous

Communicating with someone at different times, such as emails, discussion board or forum postings or a letter where someone states something and a while later the recipient responds.

Authentic Experience

An authentic experience is an experience that is real or can be related to real life experiences.
**Avatar**

An avatar is an electronic presence that imitates real life in the form of a person’s graphical presence which can be personalised into any form desired. Figure G1 is an example of the author’s avatar which is used within a virtual world. Avatars are controlled via the keyboard or mouse, and can move virtually. Avatars communicate by talking through audio features of the software or via text.

![Avatar Image](image)

*Figure G1. An example of an avatar, the researcher’s avatar, Jass Easterman*

**Blog**

Blogs began as an online diary, but have evolved to be an information portal. A blog enables sharing of information, can be collaborative and have different levels of access so the user can view the content or contribute to it. The educator decides on which option and sets up the blog accordingly. Entries are sorted by the most recent posting at the top. Blogs were developed in the mid 1990s (Wikipedia, 2010), known as a weblog, which was eventually shortened to blog.

**Bots**

A bot (commonly known as, but not the same as, a robot) is a non-player character. Bots are programmed to populate a 3D virtual world or undertake menial tasks that would be time consuming for someone to do in real life, such as greeting guests, handing out brochures, taking orders or operating equipment. They can also interact with real life users through conversation via text and audio chat and also action, interaction and decision making, all that usually require a real life character. It is difficult to know that they are a bot and are not operated by a person.
Chat Log

A chat log refers to the recording of online (inworld) dialogue that occurs when communicating via text through any tools that enable chat. These logs can be downloaded, saved and analysed.

Chat Room

Chat rooms enable synchronous discussion with others online at the same time. It provides instant responses. People can talk to each other “live” through text via the keyboard.

Communication

Communication is interacting with others via audio (voice), visually (text, images, video), or through touch and body language.

Digital Age

Digital age is referred to as the time in history when technology is used digitally to enable instant access to knowledge.

Discussion Board/Forum/Bulletin Board

A discussions board, also referred to as a bulletin board or forum, are used to post information, ideas or questions enabling others to respond asynchronously. Discussion boards make it possible for someone to consider their response before posting.

Distance Learning

Distance learning is studying in off-campus mode, that is, receiving all study materials from sources other than face-to-face. These students are usually enrolled in study from locations remote to the campus. Students choose to study by distance mode due to location, work, family and lifestyle commitments.

Engagement

Is a combination of feelings, observable actions, perceptions and beliefs.

eLearning

eLearning is an abbreviation of electronic learning, just as email is an abbreviation of electronic mail. All learning that takes place through electronic means can be referred to as
elearning. Figure G2 outlines many of the current elearning tools being used in higher education institutions.

**Gamers**

Online Internet users who play games, usually synchronously, with and against other online users.

*Figure G2. Online elearning tools being utilised in Higher Education Institutions*

**Information Communication Technology (ICT)**

Information Communication Technology refers to the types of information and communication that occur utilising technology, often referred to as ICT.

**Interactive Tools**

Interative tools interact with the medium to facilitate an action to take place and can be used to respond to touch, voice or other means to.

**Inworld (in-world)**

If someone is in a 3D virtual world with their avatar, this is referred to as inworld. They are in the virtual world.

**Lag**

Slowness due to bandwidth or computer hardware issues.
Learning Management Systems (LMS)

Learning Management Systems embed a variety of elearning tools for students, educators and associates to access online via the one portal. Access is secure through a username and password. Students are able to download study materials, access readings, submit assignments and receive feedback, listen to podcasts, view vodcasts and access many web based medium from within the LMS, such forums, blogs, wikis and chat rooms.

Logging In

When someone is “logging in” or “logs in” to an elearning tool, they are provided a username and password so that they enter their own personalised space. Students log in to the LMS to access study materials which provides them with access to their study materials in the subjects they are enrolled in. Students log in to a virtual world so that they can interact through their personalised avatar.

Machinima

Machinima is inworld video. A variety of machinima created as part of this research can be found at http://www.virtualclassrooms.info/machinima.htm.

Multi-Modal Learning Environments

Multi-modal learning environments describe a variety of ways in which learning can take place in the different spaces provided. Multi-modal refers to having more than one way of learning.

Off-Campus Students

Off-campus students are those students who opt to receive all their study materials either through a LMS where they can download documents and participate in online activities or via post in hard copy on paper, CD or DVD. These students may live on-campus but choose to study as off-campus students or they may be located in areas remote to the campus, from any location worldwide. Off-campus students undertake their study via a variety of means and do not receive face-to-face tuition/instructions. There may be an occasion when they visit campus for an intensive school. Off-campus students are often referred to as distance students.
On-Campus Students

On-campus students are those students who opt to physically attend face-to-face lectures, workshops and tutorials, on-campus. On-campus students receive their tuition via a LMS and through face-to-face instruction.

Online

This is when someone is accessing the Internet. They are online. This could be viewing web pages, accessing the LMS or social networking tools. To be online requires the ability to access the Internet via a wired or wireless connection.

One Portal

One place.

Pedagogy

Pedagogy is the way someone teaches. It is the knowledge and skills required for effective teaching.

Podcasts/Vodcasts/Enhanced Podcasts

Podcasts/vodcasts/enhanced podcasts enable the user to hear and/or see a lecture or discussion that has been recorded. Podcast are audio recordings which enable students to listen to a discussion/lecture. Vodcast are a downloaded television program or documentary to be viewed asynchronously. Enhanced podcasts are a combination of the audio and presentation enabling a student to view and listen to them.

Rezzing

Coming into focus.

Scaffolding tool

Complete task/s prior to going on to the next. Tasks are built on each other.

Second Life (sometimes referred to as SL)

Second Life is a 3D virtual world. Higher education institutions are using Second Life to emulate face-to-face models of teaching where they deliver lectures as would occur in “real life”; i.e. stand out the front and give the lecture with a presentation. Others are using the tools
available in this virtual world to have students conduct business, write up the results and create profit and loss statements. The environment has been established for those who wish to use it. It requires a clear understanding of the structure and imagination as to how it could be utilised. Second Life is also being used to demonstrate things that are impossible to do in real life.

**Synchronous**

Communicating with someone at the same time, such as postings to a chat room or face-to-face conversation where the conversation is instantaneous

**VirtualPREX**

Virtual Professional Experience, practicum, professional placement.

**Virtual World (sometimes referred to as vw or vws)**

A virtual world is a low cost computer program that can simulate and/or substitute real-world activities through a person’s avatar. Real world can be replicated in context, which makes it an ideal place to incorporate teaching and learning into student study materials. As users are able to create their own content in many virtual worlds, there has been an explosion of creativity, innovation and engagement in this medium. Figure G3 is an example of avatars (people) interacting in a virtual world. Virtual Worlds embed asynchronous and synchronous elearning tools. There are a variety of virtual worlds such as Second Life, Open Sim, VastPark, Active Worlds, Quest Atlantis, Entropia, Gaia Online, World of Warcraft, Kaneva, Star Wars Galaxies, Reaction Grid and The Sims Online. Many virtual worlds have been developed and subsequently decommissioned such as Google Lively, There and Teen Life. Google Lively was only available for six months, however There and Teen Life had hundreds of thousands of users, all of whom had to find alternative virtual worlds to learn and interact in. All virtual worlds require the creation of one’s own avatar to enter the world and interact with others. Inside the virtual world educators can set up classroom situations and tasks for their students to undertake. Educators and students communicate via text chat and audio and are able to see each other’s avatars “live”. They can also hold one to one discussions with people in different locations within the virtual world and send messages for the next time that person goes online to receive asynchronously or via email if enabled. Educators can hold virtual presentations, show videos and use a variety of virtual tools to present to their students.
Web 2.0

Web 2.0 refers to social networking and elearning tools. Web 1.0 are web pages that are purely for information dissemination and are non-interactive. They are static pages. Web 2.0 are an interactive medium where the user can interact with the content of other users.

Wiki

A wiki is an elearning tool that enables the collaboration, creation, editing and linking of web pages and uploading of images and videos to share with others. Due to its nature and ease of setting up, wikis enable collaborative learning and sharing of information without requiring hosting of a website or knowledge of web editing. Wikis were first developed in 1995 by Ward Cunningham with WikiWikiWeb and was so named because of the Hawaiian word for “fast” (Godwin-Jones, 2003). Wikis are an asynchronous elearning tool.