3D Virtual Learning Case Study

Institution
University of South Australia

Course/Subject
Design for Interactive Media (INFT 2005)

Contact
Denise Wood and Frank Kurzel (coordinators)

Prerequisite Skills
Students have completed all level 1 courses in digital media

No prerequisite skill in using 3D virtual learning environments assumed

Background
Design for Interactive Media is a core level two course within the Bachelor of Media Arts, Bachelor of Information Technology (Computing and Multimedia) and Bachelor of Computer and Information Science, Bachelor of Media Arts programs. The course provides the foundations for understanding the principles and elements of design, with a particular emphasis on how these principles can be applied effectively in an interactive multimedia publication. Students develop problem solving skills, learn how to draft design specifications and create an interactive game using advanced skills in Adobe Photoshop and 3D Virtual World building and scripting tools. The final project provides students with the latitude to apply their own creative flair to the production of a collaborative 3D game based on a theme of their choice.

Aims and Objectives
On completion of this course, students should be able to:

- Understand the basic terminology, concepts and principles of graphic design and visual language;
- Understand the specifications and limitations of designing for screen;
- Convey information effectively and concisely;
- Create different information structures to control interactions in the interface;
- Apply the above knowledge and skills in a variety of design situations.

Intended Learning Outcomes
The course places emphasis on applying the principles and elements of design to the creation of an interactive game. The topics covered in this course combine theoretical information presented through a series of readings and reflections on theory with the applied skills required to:

- work collaboratively and communicate effectively with team members;
- solve complex problems in a complex gaming environment;
- design and develop an interactive game in a 3D virtual world;
- engage in reflective practice through peer review.

Assessment

The University of South Australia has adopted a statement of seven graduate qualities as the outcomes it seeks for its undergraduates. These graduate qualities are reflected in the learning objectives within courses and each of the qualities has indicators which serve as a guide to their development. The graduate qualities emphasised in Design for Interactive Media focus on students' ability to work collaboratively and alone, their communication skills and problem solving through collaborative team activities. These graduate qualities are integral to the assessment tasks, and are reflected in the following overall criteria which address students' demonstrated ability to:

- analyse, critique and communicate;
- problem solve and apply theory to practice;
- work autonomously and in groups;
- behave in an ethical and professional manner;
- design an interactive game in keeping with the principles of designing for interactive media with an emphasis on aesthetics and usability;
- apply visual communication knowledge to interaction design;
- commit to high standards of professional practice

Students undertake the following three assessment points in the course:

	Form of assessment	Weighting	Due date
1	**Assignment 1:** Written Design Specifications	15%	Friday 4:00pm, Week 5
2	**Assignment 2:** Design the basic game Interface	40%	Friday 4:00pm, Week 9
3	**Assignment 3:** Integration of Game Components and Media	45%	Friday 4:00pm, Week 13

Description of Learning Activities

In the first trial conducted in the first semester of 2008, the course was offered in blended mode. Students were all enrolled in the face-to-face offering of the course but were free to choose whether to attend lectures and practicals on campus and/or in *Second Life*. Visiting lecturers presented weekly topics both on campus and in-world, and students attended practical sessions to gain the required skills in *Second Life* to create their interactive games.

Students joined *Second Life* via the University server, which enabled them to sign-up to *Second Life* and then be transported to the University virtual island. When students arrived at the island they undertook a specially prepared orientation to *Second Life*, which covered topics such as how to move in *Second Life* (ie walk, fly, use gestures and the camera and move tools), how to use the chat tools, communicate via IM and use the voice option. Students were also provided with a gift box containing note cards of landmarks, free clothes and useful scripts and textures.

Mentors were employed to be available at specified times in both *Second Life* and in a tutorial room on campus. A virtual mentor's office was created in *Second Life* for students who required individualised, confidential consultations and mentors also roamed around the island during designated help session times offering assistance when required by students.

The students enrolled in the course during worked collaboratively as teams to create an immersive 3D game in *Second Life* using a mix of skills including script writing, storyboarding, interface design and scripting. Students were provided with shell 'holodecks'; hollowed out cylinder-shaped rooms of 35 metres in diameter, which they textured to create

a 360 degree simulated environment. All the required scripts were supplied and students were required to customize the scripts and interface to fit their chosen theme for the game.

Students were given the option of completing the course entirely off-campus or attend practicals and lectures on-campus. All lectures on-campus were simultaneously conducted in *Second Life* enabling students who were unable to attend classes, the opportunity to still participate in the course. Twelve students chose to attend lectures externally via *Second Life* and of those, four also attended practicals virtually. At the completion of the course students attended a peer review session during which they critiqued each other's games.

Related material

(eg student presentations, images, student discussions, example assignments)

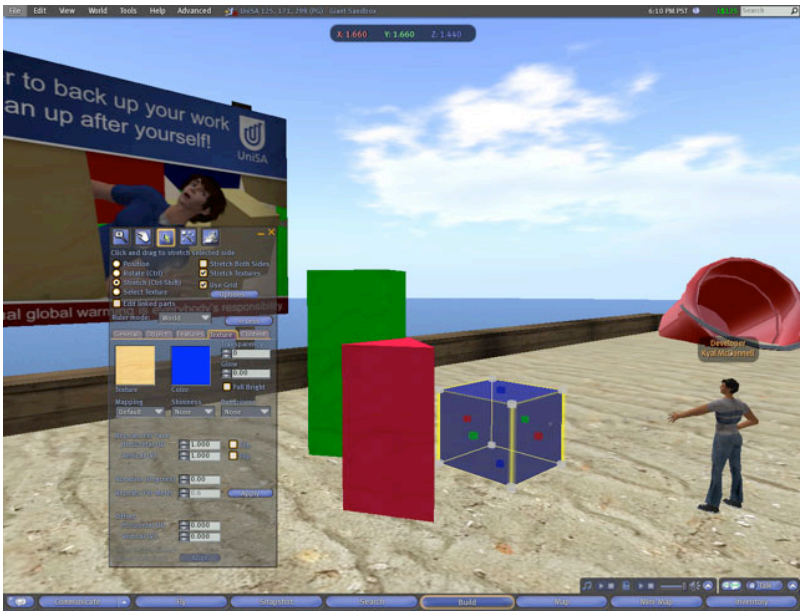
Orientation

Students signed up to *Second Life* and were transported to an orientation area on the island where they took customised tutorials to familiarise themselves with the environment. Various tools were also provided (textures and scripts) to assist students with the construction of their games.

Tools were provided for students as part of their orientation to *Second Life*

Tutorials

Students attending UniSA on campus undertook classes in blended mode; attending lectures and practicals at UniSA an in-world. Some students attended classes entirely within *Second Life*. Following is a screen shot of one of the building classes conducted in *Second Life*. Students also had access to "sand boxes" to practice their building skills.



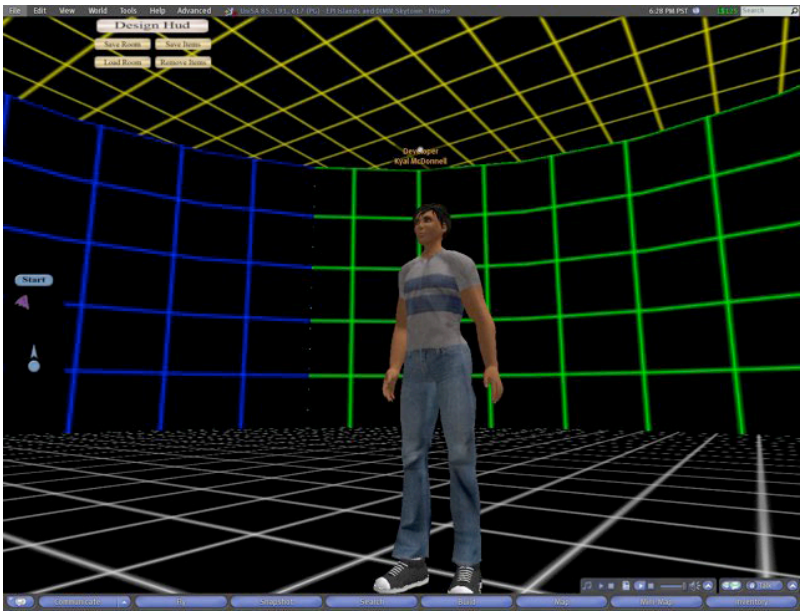
Building tutorial conducted in *Second Life*

Sandbox for students to practice their building skills

Resources for students

Student groups were provided with 35 metre hollow cylinders arranged on plots of virtual land on two platforms elevated in the sky above the island. These hollow cylinders (holodecks) were the shell templates students used to create their interactive games. The outer walls of the cylinders were transparent so visitors could see the games from the outside. Students textured the inside walls of their holodecks to create 360 degree panoramas which changed to different scenes as players interacted with their games,

Student groups were allocated a block of virtual land arranged on platforms in the sky



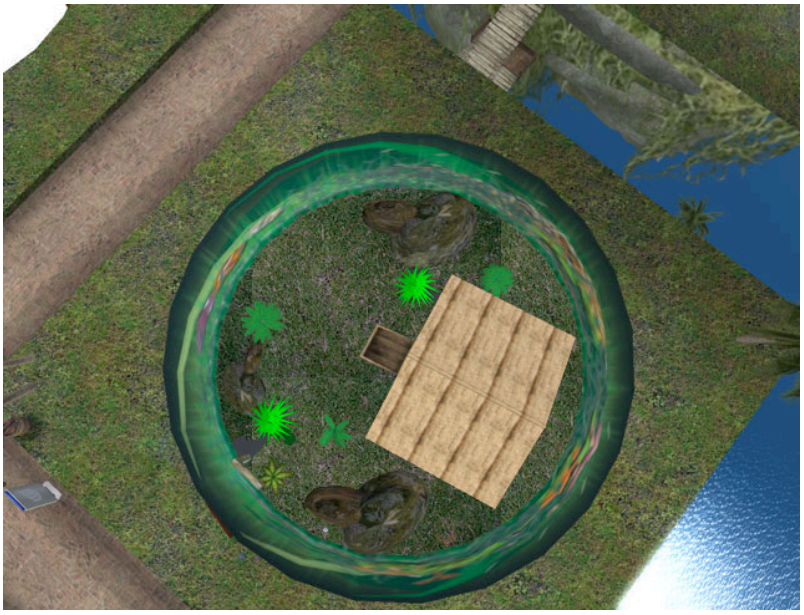
Hollow cylinders were provided to each student group in which they constructed their games

An example game was created based on a fantasy adventure theme featuring a dragon stranded on an island needing help from the player to solve puzzles and find objects to help the dragon escape and fly back home. Scripts from the example game were available to students so they could adapt for their own games.

Example game provided to help students construct their own games

Student examples

Following are screen shots of one of the games created by a group of Design for Interactive Media students. The game was based on an adventure game format using a fantasy "Tarzan" theme.



Arial view of the "Tarzan" game constructed by students

External view of the “Tarzan” game with transparent external walls

Player’s view of the “Tarzan” game

Students undertook peer review of each other's games at the conclusion of the course

Evaluation

Students were asked to complete an anonymous online questionnaire at the conclusion of the semester. This questionnaire included questions aimed at identifying students' familiarity with and use of Web 2.0 and 3D virtual world technologies, and to assess the extent to which the *Second Life* platform of delivery was perceived by students to support the objectives of the course and enhance their learning. The questionnaire included a mix of Likert-scale (5 point scale ranging from 1 strongly disagree to 5 strongly agree) and open-ended text field questions. Forty-two students (46.6%) responded to the evaluation

Student rating of the criterion *'*My classmates and I cooperated in completing assignments in *Second Life'* was 3.53. Students who enjoyed the social interaction commented 'We spoke more about our assignments, and what was required of each of us' and 'It [interaction] improved, I'm used to doing assignments by myself'. The benefits for DIM students taking the course externally were also evident with comments such as 'It made it easier for me as I didn't have to leave home to have discussions and interactions with my classmates tutors and lecturers'. This finding is not surprising given students worked in groups in constructing their multi-user games.

Overall student ratings for criteria relating to the effectiveness of learning activities in *Second Life* were higher than for criteria relating to social interaction, with the highest ratings being given to the criterion *'*The learning activities in *Second Life* required me to think critically in *Second Life'* (3.23) and *'*I was willing to put in the effort needed to complete the learning activities in *Second Life'* (3.38). On the other hand, many students were frustrated with the limitations of the platform; as one student put it '[*Second Life*] severely hindered my learning as I felt I could be learning useful skills not playing around in a tacky virtual world making extremely dodgy games' and another who suggested 'It made me further understand that the internet is not ready yet, especially 3D virtual environments, as a distribution tool'. The average rating given to the criterion *'*I would take another course that used *Second Life'* by both *DIM* and *EPI* students was 2.0 (meaning *'*disagree*'*).

Students rated criteria relating to the materials provided and the supports available to them in *Second Life* higher than criteria relating to social interactions or learning activities, with an overall rating of 3.32 for supports compared with 2.52 for learning activities, and 2.96 for social interactions. Despite providing three in-world and three on-campus help sessions each week, several students commented that they needed tutor support after normal teaching hours to manage the environment.

While there were some positive responses to the open-ended text questions about the environment, such as 'it was good to expand my knowledge about online environments' and the experience 'broadened my horizons', the majority of student comments were negative; the main issues reported by students being the 'inappropriateness of the platform', 'the lack of stability of the server', 'frustration that the activities distracted them from being able to spend more time on tasks they felt were more likely to enhance their employability'.

It was evident that technical glitches with the platform contributed to student dissatisfaction with the learning experience and interviews with their teachers confirmed that these issues were of irritation to most students. However, the teachers also noted, 'Sure, some students complained about *Second Life* being buggy, but that is just an excuse. Most of the students in my class were unhappy the minute we told them they would be creating their interactive games in *Second Life* because they had their minds set on creating their games in Flash'.

Conclusion

The trial of *Second Life* in the Design for Interactive Media course demonstrated the potential of such collaborative environments in engaging students in team work, problem solving and enhancing communication skills. Most student groups completed the assignments to a high standard. Students were able to work collaboratively on their games outside class times and one group of students completed the entire course externally.

The potential benefits of the platform were not realised in this offering of the course due to the lack of stability of the platform, and students' preconceived notions about the platform they would have preferred using for the design of the game. This suggests students were more focused on wanting to learn a particular set of skills (ie Flash game design) rather than the more generic skills the activities fostered such as team work, communication and problem-solving.

While it is likely that the technical issues did colour student evaluations of the benefits of the learning experience, the outcomes from the trial also highlight the need to embed and make more explicit the importance of developing life-long learning skills as opposed to technical skills relating to specific software applications earlier in the students' program of study. The trial also suggested that the challenges associated with learning how to navigate a complex environment may have also impacted on the demands of the game design task, since students were both familiarising themselves with a new mediated environment while also learning the specific skills (building and scripting) required by the task. Students ideally should be introduced to less challenging activities in first-year classes to avoid such cognitive overload in subsequent more demanding courses.

Relevant References

Bloomfield, R. J. (2007). *Worlds for Study: Invitation-Virtual Worlds for Studying Real-World Business (and Law, and Politics, and Sociology, and....)*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=988984 [viewed 8 August,2008)

Clark, S., & Maher, M. L. (2003). The Effects of a Sense of Place on the Learning Experience in a 3D Virtual World. In *Communities of Practice.Research. Proceedings of the 10th Association for Learning Technologies Conference (ALT-C2003)* (pp. 82-101). Sheffield, UK: University of Sheffield.

Hayes, E. R. (2006). Situated learning in virtual worlds: The learning ecology of Second Life. AERC Conference Proceedings. http://www.adulterc.org/Proceedings/2006/Proceedings/Hayes.pdf.

Hendaoui, A. (2008). 3D Social Virtual Worlds: Research Issues and Challenges. *Internet Computing, IEEE*, 12(1), 88-92.

Prensky, M. (2001). Digital natives, digital immigrants. On the Horizon, 9(5), 1-6.

Robbins, S. (2007). A futurist's view of Second Life education: A developing taxonomy of digital spaces In D. Livingstone & J. Kemp (Eds.), *Proceedings of the Second Life Education Workshop Community Convention*, pp. 27-33. Chicago Hilton: The University of Paisley.

Publications Relating to this Case Study:

Wood, D. and Hopkins, L. (2008). 3D virtual environments: businesses are ready but are our 'digital natives' prepared for the changing landscape? *Proceedings of ASCILITE 2008: Hello! Where are you in the landscape of educational technology?* Deakin University, Melbourne.

Wood, D. (2008). Real life access to Second Life worlds: The potential, the problems and the possibilities for a barrier-free future. *International Journal of Diversity*, The University Press Journals, New York.

Wood, Denise (2010). Engaging undergraduates in flexible, experiential learning through immersive 3D virtual worlds: virtually possible but are our "digital natives" ready? In G. Vincenti and J. Bramam (eds.) *Teaching through Multi-User Virtual Environments: Applying Dynamic Elements to the Modern Classroom*, IGI Global, Hershey PA.

Evaluation Tools

Example of the online questionnaire students completed at the end of the course.

Experiences using 3D virtual worlds such as Second Life in courses at UniSA

Thank you for agreeing to participate in this survey. Data collected through this survey will be used to improve the quality of teaching and learning at UniSA and could also be used in external publications and presentations. Individual responses will remain confidential and no individuals will be identified.

Demographic

1. What is your Program at UniSA?

- (Enter text into this box, maximum 2000 characters)

2. Age Range

-

3. Gender

- (Enter text into this box, maximum 2000 characters)

Computer Us

4. How often do you use a computer at home?

-

5. How often do you use a computer at University?

-

6. How often do you use chat software / instant messenger (e.g. AOL, MSN, ICQ, etc)?

-

7. How often do you use social networking sites (e.g. Facebook, MySpace, Flickr.)?

-

8. How often do you use online multi-user computer games (e.g. World of Warcraft, Everquest, etc)?

-

9. How often do you use 3D online virtual worlds such as Second Life?

-

10. How often do you use social bookmarking sites?

-

11. How often do you use the computer to access podcasts / webcasts?

-

Internet Access

12. Do you use a high speed connection to the Internet from home or dial-up?

-

Second Life Student Survey

13. What communication tools did you use?

- ☐ None
- ☐ Second Life chat tool
- ☐ Second Life audio tool (Voice Over IP - VOIP)
- ☐ Tools outside of Second Life (discussion boards, chat, blog, etc)
- ☐ Other (explain in final comments)

14. How would you classify your performance in this course (i.e. grades)?

- ○ Excellent
- ○ Above Average
- ○ Average
- ○ Below Average
- ○ Poor
- ○ Other (explain in final comments)

Social Presence (immediacy and intimacy)

15. I felt as if I was communicating with a real person in Second Life.

- [ ]

16. I was able to be expressive in Second Life.

- [ ]

17. I was comfortable interacting with other participants in Second Life.

- [ ]

Engagement

18. I was engaged in the learning experience in Second Life.

- [ ]

19. Second Life was an enriching experience.

- [ ]

20. The learning experiences were active and collaborative in Second Life.

- [ ]

21. Using Second Life was fun and exciting.

-

22. I was willing to put in the effort needed to complete the learning activities in Second Life.

-

23. Second Life was a waste of time.

-

Online Learning Community

24. The learning activity encouraged contact between myself and my classmates in Second Life.

-

Satisfaction

25. I would take another course that used Second Life.

-

26. I would recommend that the instructor continue using Second Life.

-

27. I liked using Second Life as part of my course.

-

28. Participating in Second Life was a useful experience.

-

29. It was difficult to access Second Life.

-

30. Getting into Second Life was easy.

-

31. Technical support was available when I needed it in Second Life.

-

32. I would avoid classes using Second Life in the future.

-

33. I would not recommend this course to a friend.

-

Learning
34. Second Life allowed me to better understand concepts.

-

35. Using Second Life helped me think more deeply about course material.

-

36. Second Life did not help my learning in the class.

-

Online learning design (support, design, delivery, assessment)
37. The introductory explanations on how to use Second Life were clear.

-

38. The activity in Second Life was well-organized.

-

39. I understood all components of the activity in Second Life.

-

40. The instructions for Second Life were clear.

-

41. The activity offered opportunities for interaction and communication in Second Life.

-

42. The goals in Second Life were clearly defined.

-

43. I understood what was expected of me in Second Life.

-

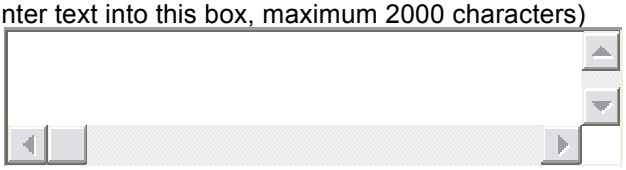
Open-Ended Questions

44. How did Second Life impact your communication and interaction with others in this course?

- (Enter text into this box, maximum 2000 characters)

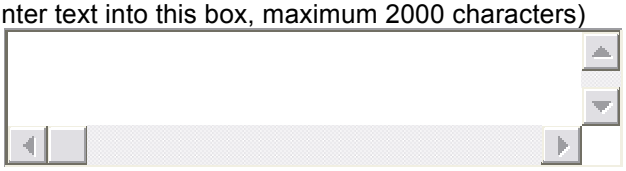
45. How was using Second Life different than using tools in a Course Management System, like discussions or chat tools?

- (Enter text into this box, maximum 2000 characters)



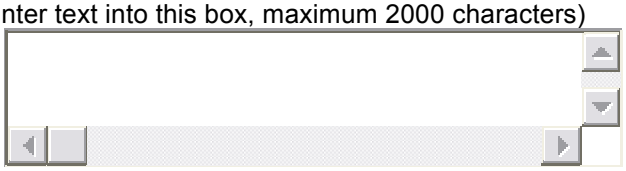
46. What was one thing that you would change about your experience in Second Life?

- (Enter text into this box, maximum 2000 characters)



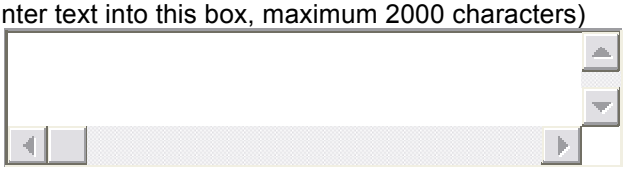
47. What was one thing that you liked about your experience in Second Life?

- (Enter text into this box, maximum 2000 characters)



48. How did Second Life impact your learning for this course?

- (Enter text into this box, maximum 2000 characters)



49. Is there anything else you would like to share with us about your experience?

- (Enter text into this box, maximum 2000 characters)