

MULTI-USER VIRTUAL ENVIRONMENTS FOR TEACHING AND LEARNING IN HIGHER EDUCATION: PERSPECTIVES FROM STUDENTS AND TEACHERS USING SECOND LIFE

MÔI TRƯỜNG ẢO-ĐA NGƯỜI DÙNG CHO VIỆC DẠY VÀ HỌC TRONG GIÁO DỤC ĐẠI HỌC: CÁC QUAN ĐIỂM TỪ HỌC SINH VÀ GIÁO VIÊN TRONG VIỆC SỬ DỤNG SECOND LIFE

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TÓM TẮT:

Các tổ chức giáo dục đang phải đối mặt với nhiều thách thức, nhất là, làm thế nào để xử lý và quản lý giáo dục học sinh lớn lên trong thời đại kỹ thuật số. Bài báo này mô tả các kinh nghiệm của học sinh và giáo viên từ một trường đại học Hong Kong đã sử dụng *Second Life* - Môi trường ảo đa người dùng (MUVE) - cho giảng dạy bốn khóa học thí điểm từ một chương trình đào tạo ngành khách sạn và du lịch. Nó xem xét các loại hình hoạt động sử dụng trong các MUVE cho các nghiên cứu khách sạn và du lịch - mô phỏng vai trò, bài giảng ảo, thiết kế phòng và các chuyến đi thực tế ảo. Những phát hiện chỉ ra nhận thức của học sinh khi sử dụng MUVE và quan điểm của giáo viên về việc sử dụng *Second Life*. Nghiên cứu này thảo luận về những thách thức và các vấn đề phải đối mặt như- đường cong học tập và các vấn đề liên quan đến công nghệ và hỗ trợ, cũng như các lợi ích của việc sử dụng môi trường ảo. Học sinh được hỏi những khó khăn gì mà họ trải nghiệm trong việc sử dụng *Second Life* qua tám kích thước trên quy mô Likert 5 điểm. Học sinh chỉ ra rằng họ đã tìm thấy các thiết lập ban đầu, đăng ký, và cài đặt khó khăn hơn bằng cách sử dụng một avatar và làm việc trong *Second Life*. Bấy thách thức chính phải đối mặt bởi hầu hết các giáo viên và học sinh đó là công nghệ, hỗ trợ, phát triển giảng viên, các vấn đề pháp lý, nội dung dành cho người lớn, đường cong học tập và chi phí. Giáo viên thấy rằng những lợi ích quan trọng nhất của *Second Life* chính là những thách thức liên quan đến khả năng cung cấp cho sinh viên tính tương tác nhiều hơn và hưởng các kinh nghiệm học tập của họ, cũng như sự đa dạng thêm vào giảng dạy. Thông tin phản hồi từ học sinh và giáo viên trong thử nghiệm đầu tiên của *Second Life* cho thấy rằng cả hai nhóm đều thấy rằng kinh nghiệm của họ trong sử dụng MUVE là tích cực và có lợi cho học tập. Kết luận của chúng tôi ở đây là, nhìn chung sinh viên đều cảm thấy *Second Life* thú vị để sử dụng, nó gợi lên sự quan tâm của họ đối với học tập và cung cấp một kinh nghiệm tương tác. Khi các vấn đề kỹ thuật được giảm thiểu, và học sinh và giáo viên được chuẩn bị tốt cho các lớp học, khi đó nó là một phương tiện rất tích cực để thúc đẩy học tập và cung cấp kinh nghiệm học tập tương tác nhiều hơn và thú vị hơn cho học sinh và giáo viên.

Keywords: *Multi-User Virtual Environment, Virtual Worlds, Second Life, Higher Education, Tourism Education*

ABSTRACT:

Academic institutions are facing many challenges, not least, how to handle and manage the education of students brought up in the digital age. This paper describes the experience of students and teachers from one Hong Kong university that used *Second Life* – a Multi-User Virtual Environment (MUVE) – for teaching four pilot courses from a hospitality and tourism curriculum. The study reviews virtual environments and the use

of Second Life in teaching and learning in higher education. It considers the type of activities used in the MUVE for hospitality and tourism studies – role play simulation, virtual lectures, room design and virtual field trips. The findings set out the students' perceptions of using the MUVE and teachers views on using Second Life. The study discusses challenges and problems faced – the learning curve involved and technology issues and support, as well as the benefits of using the virtual environment. Students were asked what difficulties they experienced in using Second Life across eight dimensions on a 5-point Likert Scale. Students indicated that they found the initial set up, registration, and installation more difficult than using an avatar and working in Second Life. The seven major challenges faced by most teachers and students were technology, support, faculty development, legal issues, mature content, learning curve and cost. Teachers saw the most important benefits of Second Life as those related to their ability to provide students with more interactivity and enjoyment of their learning experience, as well as the variety added to the teaching. Feedback from students and teachers in this initial trial of Second Life indicated that both groups found their experience of using the MUVE to be positive and beneficial to learning. Our conclusions here are that generally students find Second Life fun to use; it arouses their learning interest and provides an interactive experience. When the technical issues are minimized, and students and teachers are well prepared for class, then it is a very positive medium to enhance learning and provide more interactive and enjoyable learning experiences for students and teachers.

Keywords: Multi-User Virtual Environment, Virtual Worlds, Second Life, Higher Education, Tourism Education

1. INTRODUCTION

Students today are digitally attached in ways that their parents never were – smart phones and online networks ensure they

are connected, communicating, constantly reacting to digital media. No longer do they use email like their previous generation, instead they SMS, 'Facebook' or Tweet their friends and contacts. These young people belong to virtual communities with shared interests (communities of interest), they develop social relations (community of relationships), and explore new identities (communities of fantasy) (Hagel and Armstrong, 1997). According to Zemsky and Massey (2004), students want to use technology in order to be entertained through music, games and movies, to be connected to one another and to present themselves and their work. The EDUCAUSE Teaching and Learning Challenges 2009 project (Educause, 2009) states that creating learning environments that promote active learning, critical thinking, collaborative exchange, and knowledge creation is the number-one challenge institutions face today and that digital technologies are one of the keys to providing these stimulating learning environments.

Yet, despite the challenges of engaging students through new digital media, there are signs of change, with teaching and learning taking place in many institutions which demonstrate student-centred and innovative teaching through use of new technologies. Along with ubiquitous media such as YouTube, photo-sharing, and social networks such as Facebook, there have been extensive developments of virtual worlds, simulations and 'Serious Games' (Annetta, Murray, Laird, Bohr and Park, 2006).

2. MUVEs for Teaching and Learning

The focus of this study is how Multi-User Virtual Environments (MUVEs) have been used to stimulate student creativity and provide new learning experiences beyond the classroom. The study used an existing proprietary MUVE – Second Life – also known as a 'virtual world', to test the use of this virtual environment for teaching and learning. MUVEs began as long ago as 1978 with the creation of MUD – the first online text-based Multi-User Dungeon game (Virtual Worlds 2008). Broadband

internet and fast 3D rendering have enabled MUVES to move into the mainstream with the proliferation of popular ‘worlds’ such as Gaia, Active Worlds, Everquest, Second Life and World of Warcraft for adults, as well as Habbo Hotel, Club Penguin, Barbie World, Wizard 101, Stardoll, and others for children and teens. Currently there are 1.185 billion registered MUVE accounts (Kzero Worldwide 2011) with just over half of them registered to 10-15 year olds

(the next generation of university students). The growth of these virtual environments is huge, with over 770 million new accounts added during two years from 2009 to 2011.

Table 1: Total MUVE registered accounts Q1 2009 to Q1 2011 (Source: Kzero Worldwide 2011)

Total registered accounts



Age Range	2009				2010				2011
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
5 to 10	77m	114m	152m	179m	190m	211m	219m	235m	272m
10 to 15	246m	334m	367m	392m	413m	444m	468m	511m	561m
15 to 25	73m	99m	117m	193m	237m	273m	288m	299m	313m
25+	18m	21m	23m	25m	27m	30m	34m	36m	39m
Total	414m	568m	659m	789m	867m	958m	1,009m	1,081m	1,185m

KZERO
WORLDWIDE

MUVES are described as persistent virtual environments, open 24/7, and enabling people represented by avatars (a personal representation in 3D form) to create, play and interact in real time. Individuals assume an identity through their avatar, and engage in various activities within their world. MUVES are environments in which users or residents can create their own virtual life and activity. Another term used by Castronova (2005) is ‘Synthetic Worlds’, sometimes known as the Metaverse – from the science fiction novel, Snow Crash – the meta-universe of avatars interacting in a 3D world.

These virtual 3D environments are rapidly developing and becoming more sophisticated with millions of real dollars being spent every year on artefacts, virtual clothing and real world goods. Virtual environments are rapidly emerging as an alternative way of communicating, collaborating, and organizing, and many companies and organizations such as

Adidas, IBM, Sun, Mazda and Coca-Cola have a presence in a MUVE, and use the environment for communication between customers and staff, collaboration between staff members, and for promotion of services and products.

3. SECOND LIFE

Second Life, the MUVE used in this study is described as a virtual landscape that allows residents (the avatar persona) to create their own world and activities, interact, play, do business, and communicate. Second Life was launched in 2003 by Linden Research (Linden Labs), and the number of registered accounts grew to around 19 million by May 2010 (Nino 2010) though many of these are not active. In Quarter 4, 2010, residents spent 105 million hours online with about 600,000 residents on average logged in over a 7-day period (Linden Labs January 2011).

Messinger, Stroulia, Lyons, Bone, Niu, Smirnov and Perelgut (2009) grouped MUVES into four categories: education-

focused (e.g. ActiveWorlds), theme-based (e.g. vSide), community-specific (e.g. Habbo), children-focused (e.g. Barbie World), and self-determined (e.g. Second Life). In contrast to the other MUVES, self-determined virtual environments do not have any specific purpose or a main activity. Messinger et al (2009 p.208) further argued that MUVES operate in many ways as the real world. They have their own economies and currencies, residents can buy and own property, attend events and concerts, go to discotheques and travel to various destinations. They can start their own businesses, provide products and services to residents or take paid work. For many 'residents' the ability to communicate with others is very important, and as distance is not a factor, people from different backgrounds, cultural and social groups can interact socially with others. Comparisons of various MUVES have been made, and it was found that Second Life was still the leading MUVE for educational users, though Open Sim and other platforms that can be controlled by university IT departments are growing strongly (Institute of Digital Innovation, 2011).

4. THE GROWTH OF MUVE'S IN HIGHER EDUCATION

Second Life has been widely adopted by educational institutions and individuals for teaching, learning and various types of research activity. Over 500 higher educational institutions have a presence in this environment, and with the Second Life educators' list numbering over 5,000 individuals, there is substantial interest in this environment from teachers and researchers (Linden Labs 2009). Data from Linden Lab (2009) indicates that around 60% of active Second Life residents are based outside of the US, representing 195 countries, with the average age around 35. In addition, Second Life members spend 100 minutes in Second Life on average per visit and send 1,250 text-based messages every second. Residents come from every walk of life and the population of Second

Life is a mixed sample of populations from all around the world. In relation to the need for relatively fast internet connection and a fairly sophisticated computer to run the Second Life application, it may not be representative of the world population as a whole.

Universities are using Second Life in a variety of ways. Some are conducting formal teaching by giving lectures, tutorials, training, presentations or demonstrations. Informal education offers more exploration and creativity and can include student exhibitions, role play, games and virtual quests (Bleacher & Stockman 2008). The most common uses of Second Life seem to be in computer studies, science subjects and humanities (Livingstone & Kemp 2007), architectural studies, urban planning, graphic design, anatomy, natural sciences, law, languages, programming, literature, art and tourism. Dickey (2005) reviewed two distance learning projects using MUVES and concluded that MUVES offered 'collaboration, community and experiential learning' and allowed learners to become 'situated and embodied' within the learning environment (p. 449).

Virtual campuses or educational islands give educators an opportunity to explore the potential of offering learning opportunities for students using virtual reality, simulations and 3D environments in a creative learning space. Avatars can explore a visually rich environment and interact with others in ways that stimulate innovation and encourage collaboration. MUVES offer a new dimension to 'distance learning' with a more personal and enjoyable experience to meet the needs of 21st Century learners. According to one study of the use of MUVES for scientific study, Bainbridge (2007) concluded that MUVES may 'foster scientific habits of mind better than traditional schools can.' He found that MUVES enable students to develop critical thinking skills and to understand their environment and that 'graduates' of MUVES may include 'many future engineers, natural scientists, and

social scientists ready to remake the real world in the image of the virtual worlds'. (Bainbridge 2007 p475)

In Vietnam, TOPICA - e-Learning Program at Hanoi Open University was the first institution from Vietnam to develop a platform in Second Life (Pham, Nguyen, Pham, Ngo and Ho, 2011). This was a joint project with Duke and Ohio Universities and supported by Microsoft, Qualcomm, Hewlett Packard, USAID and Hanoi University of Technology. TOPICA developed a virtual campus modelled on their building in Hanoi, and developed a number of simulations for accounting, law and economics. The year-long project beginning in 2008 showed how effective the platform was and will lead to further development of other scenarios.

5. USING A MUVE FOR HOSPITALITY AND TOURISM STUDIES

Along with a sound academic curriculum, the challenge for most universities is to help students make sense of what they learn, and apply learning to real world situations. Many hotel and tourism courses

have a strong operational and customer service element, and yet students have little experience of many hospitality scenarios discussed in their classes. In response to this, one institution in Asia adopted Second Life as a basis for experiential learning for hotel and tourism studies. According to Penfold, Kong and Ma (2007) the cost of developing a proprietary platform for simulations was unfeasible for most academic institutions, and recommended using a publicly available platform such as Second Life for this purpose. The main reasons for using this virtual environment was to provide a cost-effective platform, to encourage innovation and research in educational technology and to provide "real-world" scenarios for teaching and learning in hospitality and tourism subjects. For many students, to be thrust into a service industry such as hospitality and tourism without adequate practical preparation is challenging. Handling front office operations, food service or dealing with high-end customers in a 5-star hotel is not something you can easily learn in the classroom (Penfold, Kong and Lee 2006).



Figure 1: Students taking part in Second Life customer service role play activity

Using the Second Life environment, the Institution built four virtual hotels and a conference centre, plus a corporate yacht, for use with hospitality and tourism subjects. Four courses were chosen to test the virtual environment. The objectives,

learning methods, and learning activities for the virtual courses are set out in Table 1 below.

TABLE 2: Objectives, Learning Methods, and Learning Activities of Courses in Second Life

Course	Resort & Spa Hotel Management	Customer Relationship Management	Meeting Management	Hospitality Facilities Management & Design
Class size	140	35	135	75
Objectives	Evaluate and review the basic elements of a resort and spa complex.	Deal with customer problems and complaints.	Review promotional strategies and the effectiveness of virtual conference facilities.	Apply principles of facilities design to a simulated guest room.
Learning method	Virtual field trips	Role play exercises	Lecture and demonstration	Guest room design
Activity	Visit to Rixos Virtual Hotel with introduction by Marketing Manager and tour of hotel and Turkish spa	Students take role of guest or hotel staff and deal with specified customer problem	Lecture from overseas professor, plus real-time demonstration of virtual conference facilities	Teams plan and design virtual hotel guest rooms and evaluate design plan.

The virtual classes were held toward the end of the semester, some during lectures and others in tutorials. Before the classes, students attended one or two workshops in a computer laboratory to familiarize themselves with using Second Life. Here they learned how to create their avatar, change their avatar's appearance, navigate,

search, and communicate with chat, instant messaging, and voice. Students planning guest room design also learned how to manage their inventory of artefacts and how to modify the design, colours, and textures of the furnishings and equipment for their hotel rooms.



Figure 2: Role play in the virtual hotel environment

6. FINDINGS

A questionnaire was completed by 152 students from the four pilot classes to give some perspectives on students' views of using the MUVE. When asked about whether Second Life added interest to their studies, 57% of students said they found it interesting or very interesting, 24% were neutral and 19% of students found it boring or not very interesting (Figure 3). However, depending on the nature of the

activity, the responses changed, and this may indicate that certain activities are either more attractive to students or work better for them than others. For example, 58% of students doing guest room design found the activity very interesting, and 37% found it interesting; 11% of students found the virtual lecture and demonstration very interesting, and 84% found it interesting.

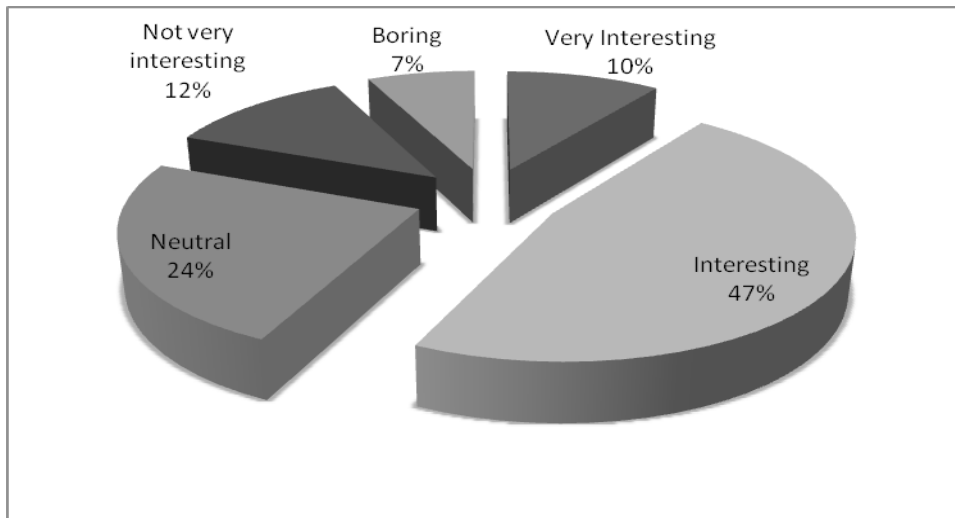


Figure 3: Students' level of interest in using Second Life in their classes

In contrast, only 40% found the field trip activity interesting or very interesting, with 34% neutral and the remaining 26% uninterested or bored. For the role play activity, 55% of students found it interesting, 21% were neutral, and 21% found it not very interesting. Our conclusions are that the more creative activities offer more engagement and a sense of satisfaction with a demonstrable outcome. The virtual lecture and demonstrations were more passive activities for students but in a familiar environment. However, the role play and field trip were more unpredictable, open-ended, and less structured, and both experienced technical problems during the activities. Further study could be made to compare Asian students with Western students to see if there are any differences in perception toward the type of activities experienced based on active and passive learning styles.

The questionnaire also asked students for their perceptions, on a 5-point Likert scale (with 5 = very helpful and 1 = not very helpful) of how well Second Life assisted their learning. For this question the rating was between 2.7 and 3.5 across nine dimensions. Across all four classes, students told us the strong points of Second Life were, "it was fun" 3.5; "it was interactive" 3.4; and "it aroused learning interest" 3.3. The weak points were, "it was effective in gaining knowledge" 2.7; "it improved collaboration" 2.9; "it updated information" 2.9; and "it improved cooperation" 2.9 (Figure 4). However it should be noted that the guest room design activities again gained a high rating, with "it was fun" 4.5; "it aroused learning interest" 4.3 and "it was interactive" 4.3.

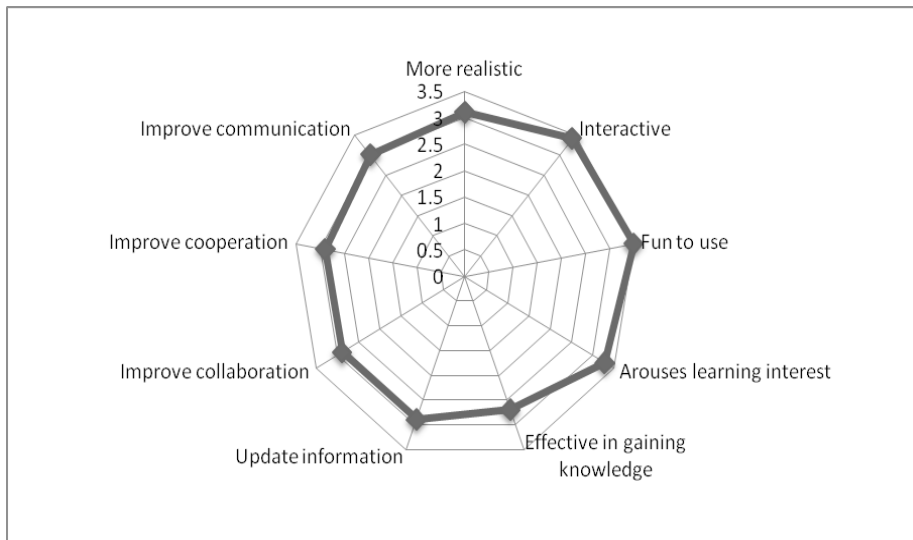


Figure 4: How students' perceived Second Life assisted their learning

Students were asked what difficulties they experienced in using Second Life across eight dimensions on a 5-point Likert Scale (with 1 = very difficult and 5 = very easy). Students indicated that they found the initial set up, registration, and installation more difficult than using an avatar and

working in Second Life (Figure 5). This confirms the teachers' perspective that more support is required at the beginning to ensure students and teachers are competent and confident in using the medium before starting learning activities.

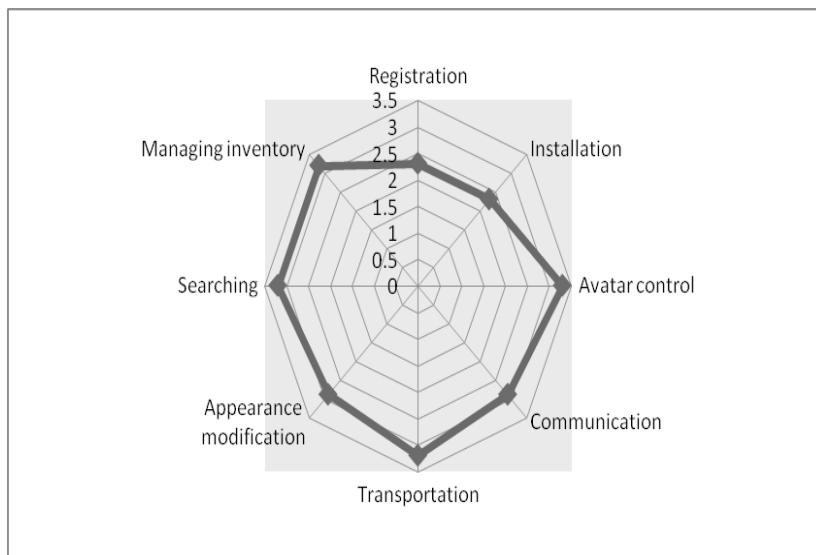


Figure 5: Students' level of difficulty in using Second Life

Our findings are very similar to another university's use of Second Life for four Spanish language classes, where 22%–40% of students were neutral about it, around 50% had technical problems, but 50% said they enjoyed the tasks, it was interactive,

and they recognized how much they had learned (Larsen, 2008).

7. TEACHER'S VIEWS OF USING SECOND LIFE

A qualitative questionnaire was used to understand the main difficulties the teachers

faced in using Second Life. They indicated that time limitations and technical issues—lack of facilities and technical or other support—were the two major challenges

faced. This is confirmed in other studies from Antonacci and Modares (2005) and Sanchez (2007).

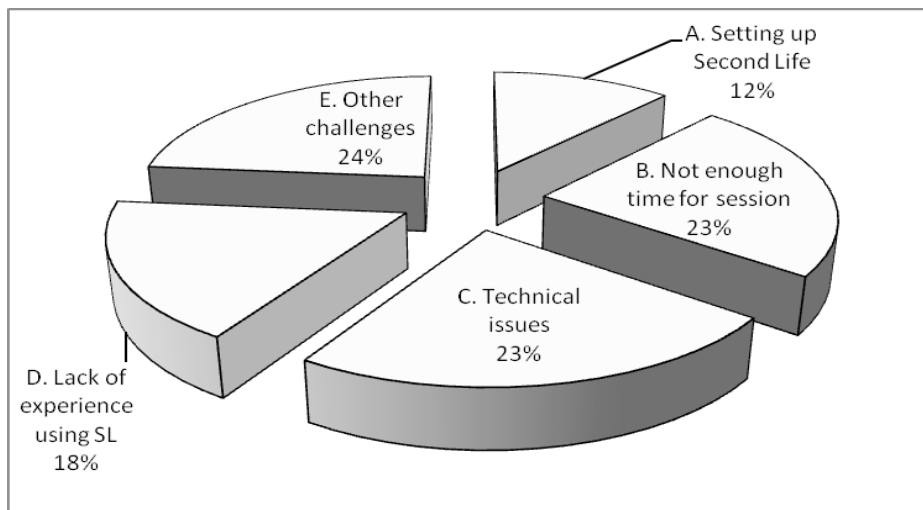


Figure 6: The main difficulties teachers experienced in using Second Life

Although the teacher's experience in setting up the software is less important, there is an essential need to provide teachers with more time for learning and using Second Life, as well as technical support and resources (Penfold 2008). Teachers saw the most important benefits of Second Life as those related to their ability to provide students with more interactivity and enjoyment of their learning experience, as well as the variety added to the teaching. Comments from teachers included, "Students enjoyed using it . . . it was an interactive experience for students . . . it was a good learning experience for students . . . it provided a new dimension for my subject and it added some variety to the subject."

8. CHALLENGES IN USING MUVES IN HIGHER EDUCATION

Before implementation of a MUVE such as Second Life takes place there needs to be full discussion of the issues and resource implications. Questions like whether to purchase or rent a shared space with other educators need to be considered. Support from the university IT department is important, along with training in the technological and pedagogical use of

MUVES. Information and promotion, with good case examples, need to be shared with senior managers and faculty members to engage them in using the platform. Collaboration with others may be one way forward—where groups of hospitality educators come together to share ideas and pool resources. However, even when these initiatives are taken, it is still only likely to be the innovators and early adopters who will probably use MUVES regularly. Though MUVES could go mainstream in the next 3 to 4 years, some educators are pessimistic about the uptake. Batson (2008) comments in a listserve: "For the majority, it will never be a comfortable learning space unless they in that majority have control while they are teaching and if they see enough people using Second Life so that a tipping point has been reached. No good to fret now because that tipping point may be 20 years away, or never!"

Antonacci, Thomas, Gerald, Lamoureux, Hollingsworth and Noakes, (2007) listed seven major challenges faced by most teachers and students, these are: technology, support, faculty development, legal issues, mature content, learning curve and cost. Many university campuses do not have

technical infrastructure to support large-scale implementation of MUVES as this requires fast computer processors and video cards and a stable network. Most MUVES run off external servers and this creates IT support difficulties for students and teachers. The majority of faculty members are challenged by new technologies and need to be handled carefully and supported extensively. Intellectual property issues, security, data protection and personal safety of students are also big concerns to universities. Along with security issues are concerns about the adult content available in MUVES, such as vendors offering virtual sex and gambling. These threats can be minimized, and are probably no more innocuous than the world-wide web. The learning curve for MUVES is steep, and it is estimated that it may take up to 40 hours to fully familiarize new users with all the essential components for navigating and functioning well in some MUVES (Antonacci et al 2007). Not everyone will be willing to devote this amount of time to learning a new piece of software. Finally, cost may be a deterrent for some universities – who may want to ensure their investment is carefully planned before committing to a long-term development in a MUVE.

9. CONCLUSIONS

Academic institutions are facing many challenges, not least, how to handle and manage the education of students brought up in the digital age. The easy option is to maintain the status quo, and to continue didactic teaching, mass lectures and the examination system inherited from the 19th Century. However, tomorrow's students will demand more, and deserve more, than the 19th or 20th century model of education currently available in most of our universities and colleges if they are really to achieve their full potential, maximize their learning and prepare for life and work in a fast-changing world. Educators and academic leaders need courage to do things differently, but are often hampered by a self-perpetuating system that is very hard to change. We may make cosmetic

changes, introduce a few innovative ideas and use technology for some of our classes, but too often we are constrained by the system we are part of, and unable to do things differently. Young (2011) reported that much of what students' rate as the most valuable part of their learning experience at college or university takes place outside the traditional classroom, citing data from the National Survey of Student Engagement, an annual study based at Indiana University at Bloomington.

It would seem appropriate that higher education institutions take seriously these concerns from educational research and from students, and explore newer ways of providing education. These could include more outside class activity, virtual learning and MUVES such as Second Life, as well as the use of common technologies such as Facebook, YouTube and Twitter. Feedback from students and teachers in this initial trial of Second Life indicated that both groups found their experience of using the MUVE to be positive and beneficial to learning. Our conclusions here are that generally students find Second Life fun to use; it arouses their learning interest and provides an interactive experience. It would seem that if some of the technical issues can be overcome and students and teachers are well prepared for class, then it is a very positive medium to enhance learning or provide more interactive and enjoyable learning experiences for students (and teachers). In a deeper way, as educators we need to continue to be open to change, embrace new technologies and be willing to consider how new information and communications technologies might enable us to move from a static classroom of the 19th or 20th century to learning environments that are not limited by time or space and that can allow students to experience rich learning with digital tools that are part of their everyday lives.

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