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Researching Learning in Virtual Worlds

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Dr Julia Gillen is a Senior Lecturer in Digital Literacies in the Literacy Research Centre, Lancaster University. She is interested in literacy, language, multimodality, technology and learning in both formal and informal settings. In 2007–2008 one of her main interests was working with children in virtual worlds, in the Schome Park programme, as described in this book. Parallel research projects involved interactive whiteboards and the school dinners debate. She has also published widely on a variety of topics concerned with young children, recently co-editing with Ann Cameron of the University of British Columbia the volume: A day in the life: An international study of two-year-old girls (Palgrave Macmillan). Julia Gillen is also a co-editor of the *Journal of Early Childhood Literacy*. The Edwardian postcard is a further area of research, offering fascinating parallels and contrasts with the contemporary digital revolution. See http://www.literacy.lancs.ac.uk/ profiles/julia-gillen for a current list of projects and publications.

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Jenny Higham is Head of Undergraduate Medicine at Imperial College. Her other senior roles include membership of the Faculty of Medicine Executive and Chairing the Faculty's Human Resources Committee. In addition to senior managerial roles, she remains research active in the fields of Medical Education and Reproductive Gynaecology. Her clinical practice is based at the St Marys Campus of Imperial College Healthcare Trust.

Katherine Howland is a Research Fellow in the IDEAs lab at the University of Sussex, and has been involved with teaching on the ILE course for the past few years. She is currently working on the Flip project, which is concerned with designing and building a bi-modal programming language to support the development of computational thinking skills through the activity of scripting events in computer game creation. Katherine is also conducting DPhil research around developing software support for school-aged children's development of multi-modal writing skills through computer game creation. She previously worked as a technology facilitator at InQbate, the CETL in Creativity. Her role there involved working with tutors to support their use of innovative technologies to enhance teaching and learning. In Second Life, she is Sal Supermarine.

Dr. Daniel Livingstone lectures on Computer Game Technology at the University of the West of Scotland. Daniel is a co-founder of SLOODLE, co-chaired the first two Second Life Education Workshops and initiated the HEA "Massively Multi-Learner" workshop series. Daniel is the lead investigator on the Eduserv funded project "Online Learning In Virtual Environments with Sloodle".

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Elena Moschini is a Senior Lecturer in Digital Media and Communications Technology and the MA Digital Media course leader at London Metropolitan University – Department of Applied Social Sciences. Before joining the university she has worked in the multimedia industry in Switzerland, Italy and the UK, managing and developing a number of interactive projects. She has expertise in the development of e-learning resources and games for education. She teaches modules on game design, digital media research, new media management and e-solutions. Her research interests include: game design, game audiences, game industries, game-based learning; e-learning, Second Life and social networks, mobile applications for education and training, digital media industries. Her avatar name is Rubra Mayo.

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Anna Peachey is Director of Innovations at Eygus Ltd (www.eygus.co.uk), the company responsible for coordinating the Open University UK presence in virtual worlds. She was Academic and Organising Chair of Researching Learning in Virtual Environments 08 (www.open.ac.uk/relive08) and is an editorial board member of the International Journal for Advanced Corporate Learning, the International Journal of Virtual and Personal Learning Environments and Impact, The Journal of Applied Research in Workplace E-Learning. Anna is currently researching identity and community in virtual worlds as a Teaching Fellow with the Centre for Open Learning in Math's, Science, Computing and Technology at the Open University, and has worked with students around the world using online and distance learning since 1995. You can find her in Second Life as Elsa Dickins.

Kieron Sheehy is a Senior Lecturer in Child Development at the Open University. His research includes teaching children with severe learning difficulties, inclusion, pedagogy, Schome and new technologies. He has a particular interest in how the affordances of virtual and augmented worlds might inspire more inclusive educational approaches.

Sarah "Intellagirl" Smith-Robbins is a PhD candidate at Ball State University and the Senior Director of Emerging Technologies at The Kelley School of Business at Indiana University. She is also the coauthor of Second Life for Dummies and was one of the first higher education instructors to conduct a class in Second Life. Her research focuses on the communication affordances of virtual and augmented realities. Sarah's dissertation is a study of over seventy virtual worlds and their communication mechanics for application in the classroom. Her current work involves designing alternate reality game, augmented reality experiences, and interactive web quests used in executive education programs. Sarah's personal website is intellagirl.com.

Liz Thackray is an Associate Teaching Fellow in the Centre for Open Learning of Mathematics, Science, Computing and Technology at the Open University where she is developing support materials for Associate Lecturers and others considering incorporating the use of Second Life in their teaching. She was a member of the ReLIVE08 organising and academic committees. Liz is also an Open University Associate Lecturer teaching on technology courses. During ILE 2008, as described in this chapter, she was an e-learning consultant for the Sussex Learning Network. She has been exploring and supporting the educational possibilities of Second Life for some years and is currently undertaking DPhil research in this area at the University of Sussex. In Second Life, she is lizit Cleanslate.

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Peter Twining is the Co-Director of the Centre for Research in Education and Educational Technology (CREET) at the Open University. He qualified as a primary school teacher in 1986, having previously worked as an ICT specialist in a school in the Middle East. He subsequently taught in the East End of London and then moved into initial teacher education. He joined the Open University in 1995 and became the head of the Department of Education in 2007. Throughout this career he has been focused on educational change, and the potential ways in which new technologies could enable enhancements in learning. In 2004 his focus on enhancing education systems led to the formation of the Schome Research Group and the development of schome (the education system for the learning age). See http://www.schome.ac.uk/ for more information about the Schome Initiative and http://www.schome.ac.uk/wiki/User:PeterT/CV for more details about Peter's career so far.

Greg Withnail is Project Manager for Eygus Ltd, the company responsible for coordinating the Open University UK presence in virtual worlds, and was a technical consultant and workshop facilitator for ReLIVE08. Greg's background is in architectural CAD, GIS and Web design. He is responsible for the day-to-day management of the Open Life regions in Second Life, administrating tenancies on the Open University's social island and facilitating the use of its learning/teaching island. Known in-world as Kickaha Wolfenhaut, he is an outspoken advocate of bringing established Web usability principles to Second Life.

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Editors' Introduction: The Physical and the Virtual

Meeting in the Physical World to Discuss the Virtual

On the 20th and 21st of November 2008 120 people, from countries around the world, came together at The Open University (OU) campus in the UK for the Researching Learning in Virtual Environments 08 (ReLIVE08) conference. Over the 2 days there were 34 papers presented, 7 workshops, 3 keynote events (involving Bill Thompson, Claudia Linden/l'Amoreaux, Ren Reynolds, Roo Reynolds and Edward Castronova), 1 symposium and a gala dinner with a guest speaker. ReLIVE08 was one of those all too rare conferences that hits the zeitgeist, bringing together people who are truly passionate about their subject and creating a real buzz, so much so that many delegates complained that they didn't want it to end – and this on a cold wet Friday in Milton Keynes just four weeks before Christmas. How did that get to be the right place at the right time?

2006 and especially 2007 saw an exponential rise in the number of educators investigating the use of virtual worlds for teaching and learning. As virtual worlds started gaining momentum in the public consciousness, early adopters were in demand to run workshops and seminars introducing colleagues to the basics of the medium and to the idea of exploiting these environments to work with students. At the same time, through special interest group mailing lists, this growing UK network was linking to other virtual world educators around the globe and the early adopters were able to share and nurture their belief that they were leading a march with the potential to be genuinely exciting and revolutionary for education. Virtual worlds, it seemed, were offering something new. We could bring aspects of our understanding of distance learning, of virtual learning environments, of virtual reality and others into play, but there is still so much to learn about how people think, feel and consequently function in a virtual world that it became apparent these early adopters were establishing a new frontier for research. Discussion, debate and explorations continued, and by the beginning of 2008 it was apparent that early studies were now generating evidence that moved far beyond the anecdotal, but that credible opportunities for disseminating this evidence were limited to a few specialist streams of the established, more generalised conferences and journals.

In January 2008 Dr Shailey Minocha, a Senior Lecturer in Computer Human Interfaces at the OU, was about to take up a Teaching Fellowship with the Centre for Open Learning in Maths, Science, Computing and Technology (COLMSCT), researching the pedagogical effectiveness of virtual worlds and their role in enhancing the student's learning experience. Anna Peachey had been working with COLMSCT since the OU bought its first Second Life™ (SL) island in 2006 and, as the two discussed the state of the genre, they identified an opportunity for a publishing and networking event that would bring people together around the central theme of researching learning in virtual worlds – the seed for ReLIVE08 was planted.

As Chair for the proposed conference, Peachey secured support from Professor Steve Swithenby, Director of COLMSCT, and Professor Denise Kirkpatrick, Pro-Vice Chancellor for Learning and Teaching, before issuing invitations to members of the programme and international academic committees. The first academic committee meeting was convened, appropriately enough, on a platform high up in the branches of a tree on Schomebase Island in Second Life, and the discussion was recorded using SLOODLE tools to a forum in Moodle, which was then used as the asynchronous discussion medium for all subsequent conference planning. The committee had a lively debate over the name of the conference (and ReLIVE has remained quietly contentious – do you say live to rhyme with give, or live to rhyme with strive?), but agreed unanimously that the conference themes should reflect the scholastic nature of research, inviting a body of work that contributed a significant step forward in the field.

From the onset, the committee agreed that the event should be open to those working in (and across) a range of academic disciplines. Emergent research in virtual worlds is increasingly the result of collaboration between technologists and discipline specialists, crossing boundaries and producing an evidence base that is at the same time about the experience of the virtual and an extension of pedagogical practice and philosophy. In constructing the call for papers, we sought presenters and participants who have experience of designing and delivering learning in virtual worlds regardless of topic, and who have the ability to reflect on and share that experience within an analytical framework. Most have been early innovators, lone voices in their institutions, representing a spectrum of subject specialisms with common ground to share.

The papers that were eventually accepted by the academic committee reflected this wide range of subjects and research methods. They embodied a mix of theory and practice, planning and reflection, participation and observation to provide the rich diversity of perspectives that were represented at the conference.

The Conference Themes

For the call for papers, presenters were asked to outline their work under the following main themes:

- *Crossing boundaries and making connections.* Papers submitted to this theme were intended to extend our knowledge of the interdisciplinary nature of research into learning and teaching in virtual worlds. Boundaries crossed included the digital divide between first and second lives, subject areas and/or research disciplines. In particular, papers outlined research processes and outcomes which draw upon or extend conceptual and explanatory frameworks from computing, cognitive science, social sciences and/or education.
- *Opportunities and challenges of virtual worlds for learning and teaching.* Papers submitted to this theme reported on research directly related to issues such as enabling disadvantaged learners. Of additional interest were the papers where opportunities and/or challenges were unforeseen at the beginning of a research programme and had a subsequent impact upon the research outcomes.
- *Approaches to research.* This theme explored the range of qualitative and quantitative research approaches utilised by researchers of learning and teaching in virtual worlds, especially accounts that highlight the efficacy of particular approaches and the pitfalls of others, and/or that illuminate issues concerned with the collection of data in-world versus real-world.

There was a good volume of submissions to the conference and the quality of papers reassured the committee that the timing was right to be offering this floor. Uptake for places was initially steady, but as word spread in the right communities the numbers increased rapidly until the top limit was exceeded and a considerable waiting list established.

And so it was, finally, that we all came to be in Milton Keynes on a wet weekday in winter. Conference name badges gave a clue as to the nature of the event, bearing not only the name by which the delegate is known in the physical world, but also a photograph of their virtual world avatar, and the avatar's name. Initial interactions between delegates were typically characterised by polite hand shaking and traditional introductions before each would peer at the others name badge and exclaim excitedly, "Oh! You're . . . !", then launch into animated chatter. Of course in all the history of conferences people have made physical connections to distance relationships, but it felt different to be making connections for relationships already established on a foundation of physical presence, albeit virtual. Indeed the tone was set when Peachey, known for her pink haired, winged avatar, opened the conference wearing a pair of big pink glittery wings.

As is the way with good conferences there was as much value in the networking between sessions as in the sessions themselves. Some sessions made innovative use of technology, such as the symposium that was webcast and linked to a Twitter tag, which was in turn projected above the stage, so that all of the audience and the presenters were engaged with both primary and back channels, posting links and answering questions online as well as verbally. Many used live links to Second Life and other virtual worlds. Jane Edwards, from the JISC Eastern Regional Centre, kept a formal conference blog and delegates talked in person, in the conference café on the Open University island in Second Life, on Facebook, on Twitter and in

individual blogs, and many posted pictures to Flickr. Each paper started a new line of chat, and the 2 days passed, it seemed, phenomenally fast.

When it was over it still felt that there was more to say, and so the suggestion of Researching Learning in Virtual Worlds, ReLIVE08 the book of the conference, was born. Four members of the academic committee convened as editors and reviewed all the papers at least twice more, hoping to pull out the right combination to represent the highlights of the best that ReLIVE08 had to offer. We looked especially for papers that were so rich in content that the authors clearly had more to say, and that would benefit from the extended platform that a chapter can offer, that were a coherent and logical contribution to the book as a single resource for researchers and that represented a range of perspectives.

A Note on Terminology

Every realm of interest comes with its own specialized terminology. When you're deep into a realm of content the terms of that world become second nature. But then, of course, the opposite is also true and a lack of terminology can prevent one's entry into a field of study. Virtual worlds, however, go beyond a simple subject of study. They contain cultures and behaviours that are unique to these digital spaces. Listening to virtual worlds advocates converse can be like overhearing a foreign language. Terms like rez, TP, avatar, mobs, raid, and XP may be comfortable to those of us who spend a significant amount of time in virtual realities, but for those new to the field they can be barriers to understanding. To that aim we'd like to provide a brief introduction for readers to some of the common concepts and terms of virtual worlds.

Virtual Worlds

Virtual worlds have certainly evolved from their inception in the age of Multi-User Dungeons (MUDs) and MUDs Object Oriented (MOOs). Humble text-based beginnings have become 3D digital spaces with millions of users, complex politics and social behaviours, and a wide variety of user demographics. A quick skim of the recent research related to virtual worlds illuminates the vast variety of definitions of just what a virtual world is. For this collection we'll make use of Bell and Robbins' (2008) operational definition which includes the following four traits:

1. Virtual worlds are persistent. They exist regardless of whether any specific individual is logged in. Typically, there are processes in these worlds such as time and economy that continue to progress in some real time scale even when an individual user isn't logged in.
2. Virtual worlds exist on wide area networks (WAN). To reach the scale of a "world" rather than an "environment" or "space" a virtual world must be

accessible on a large scale and not contained behind a firewall or similar limitation.
3. Virtual worlds are massively multi-user. This is an important differentiation between virtual spaces built for a few users and worlds which can accommodate a global scale of users.
4. Virtual worlds employ avatars to represent users. Avatars are semi-autonomous agents represented in the digital space and capable of performing actions when commanded by a user. We differentiate avatar from icon or profile which represent a user but cannot perform actions.

While this definition helps to differentiate virtual worlds from other online communities such as social networks and blogs we have to remember that even within the online spaces that fit within this definition there are still differentiations that create subcategories. The two most general categories are game virtual worlds and social virtual worlds.

Game Worlds

Multi-player online games have become a billion dollar industry in the last 10 years. From Eve Online and Ultima to City of Heroes and, the hands-down winner, World of Warcraft, these Massive Multi Player Online Role Playing Games (MMORPG) have become a business to rival cinema for entertainment dollars. At last count World of Warcraft had over twelve million players each paying around £10 per month in addition to the initial software purchase. To this is added the merchandising of t-shirts, toys, and other related items to tempt regular players. MMORPGs build huge user bases that not only play the game itself but create countless forms of content related to the game such as discussion boards, videos, comics, blogs, and videos made from capturing the action of the game (called machinima). Content within an MMORPG and about an MMORPG can amount to an incredible amount of activity.

While MMORPGs are virtual worlds by the definition above, they are also games, which implies an additional set of characteristics that serve to structure and motivate the play. A typical MMORPG allows users to create an avatar (sometimes referred to as a "toon") with a certain set of skills and abilities with which to interact with other player characters (PCs) and game generated characters called non-player characters (NPCs). Accumulation of new skills is normally related to the accomplishment of tasks such as fighting and defeating enemy NPCs such as evil orcs or hostile races of space aliens. These enemies are typically called mobs, a term derived from "mobiles" and which originated in MUD, the original text based virtual world released in the late 1970s (Bartle 2003). Defeating enemies results in experience points (XP), which accumulate and allow the character to earn new abilities, weapons, and other perks.

Though MMORPG players may have goals in addition to levelling their character, the primary activities in these worlds are centred on enhancing one's character to be more powerful and capable of accomplishing the goals of the game. These shared goals foster the creation of shared social norms and behaviours but they also reinforce an in-game literacy that allows players to "read" one another's characters through cues such as character level, armour, and demonstrated abilities.

Social Worlds

Certainly the advent of pervasive digital access has contributed considerably to an individual's ability to connect to data, but it should not be ignored that widespread access has also encouraged individuals to connect to one another. From the old bulletin board systems to discussion boards, to chat rooms, and now social networks, rather than being an isolating force, the internet has proven to be an important social connector. The logical extension of these patterns into the 3D web is the social virtual world. Spaces such as The Palace (Suler 1996) ushered in graphical social applications but virtual worlds such as Second Life and Entropia have maximized on the popularity of virtual game worlds, removing the game play to replace it with strong social tools and innovative content creation tools, much as MOOs did in the era of the text based virtual world (Bartle 2003). Removing the game mechanics also takes away shared goals but brings benefits in the form of abilities such as teleportation (instantly moving from point to point around a large virtual world sing specific points referred to as landmarks), which might conflict with game goals as well as, in some social virtual worlds, the ability to build custom content. In the case of Second Life, for example, users can create custom clothing, buildings, interactive objects, and even land masses, or "rez" (put out to make real) any item of their own or others creation from their stored inventory. Rather than experiencing content created by game designers, users in a social virtual world create their own stories and their own interactions, even where they are unable to create or form the environment itself. Of course, custom content brings with it its own complications. User created content has to be recreated for the user in a different way than would static content, and, as would be expected, not all custom content is of the same quality or style. Cohesively styled social worlds are a challenge when each user is given the ability to create anything from a pyramid to a space station.

Chapter Introductions

Virtual Worlds offer many possibilities to expand a sphere of inclusion, in the area of education, to many diverse groups. Sometimes seen as a universal access point to inclusive education, virtual worlds can contain many social, economic, cultural and physical obstructions. In this case, inclusive education educational projects in virtual worlds try to treat a diverse population of learners with equal worth. But,

the virtual world is not a panacea for a utopian view of inclusive education. In Chapter 1, Sheehy acknowledges the technical and social barriers that need to be overcome but focuses on the improvement of pedagogical and applied research. The question of how inclusive education might influence virtual world research is explored and answered. The chapter covers how virtual worlds are being used to increase inclusion and overcoming obstructions as well as discovering new ones. The international opportunities virtual worlds like Second Life, virtual tutors and augmented reality offer are reviewed, only to discover the notion that inclusive education practices and research are being stalled. The need and value of inclusive educational practices is not in doubt, but virtual inclusive education is encountering barriers. The chapter challenges the notion of the isolation of the physical and the virtual and stresses a need for educators and researchers to concentrate on the values of inclusive education to overcome these barriers. There are also examples and predictions of inclusive virtual spaces that have been built or discussed. For example, how communities of learners sometimes not included (the deaf or autistic) are being reached through virtual world technology. Through the manipulation of different modalities (text, audio, video) the author sees promise in getting closer to an inclusive virtual space. Also the use of augmented reality to create progressive scaffolding is proposed. The chapter also covers how virtual affordances may be moved to the world of augmented reality. Sheehy sees hope for future diverse virtual world participants and calls for more applied research.

Educational institutions, especially those catering for young adults ("tertiary" institutions in the UK) have been relatively quick to catch up with the opportunities offered by virtual worlds, especially SL. In Chapter 2, Moschini observes that there are a vast array of pilot projects and consequently a pressing need for research on these, especially for evaluation purposes. She points out that the essential elements of designing a research project remain consistent whatever the environment: setting aims and objectives, identifying a relevant theoretical frame, selecting appropriate methods, gathering and analysing data and disseminating results. However applying this overall approach to SL effectively demands knowledge of its specific tools, technology and what she terms "group dynamics". A particularly salient starting point is whether the project takes place wholly inworld or whether it has a physical world dimension as clearly this must accord with the approach to evaluation. Learning theories relevant to understanding education in SL are discussed; these are linked to an array of examples of educational activities in SL and discussions as to specific features of research in SL that the ethical researcher must attend to. Researching in SL is anything but an isolating experience; Moschini offers considerable suggestions both for accessing existing information on research and on how to share new learning. Virtual worlds offer a new area of inquiry for researchers and innovative ways of creating and sharing tools and methods are springing up all the time. Yet attention to overarching principles especially those relating to ethical treatment of participants remain salient, if occasionally challenging. The chapter is both a contemporary overview of techniques for researching in SL and a lasting reminder of key issues.

Twining and Footring's chapter is an overview of probably one of the most substantial SL projects discussed at RELIVE08 – the Schome Park Project (SPP). This was the first European "closed" i.e. protected project using TSL and spanned 13 months, involving around two hundred teenagers and about 50 adults. As this overview makes clear, actual participation varied and probably at any one time involved fewer avatars. The chapter begins by outlining a somewhat different starting point for working in SL than those Moschini suggests; the SPP arose from shared radical dissatisfaction with standard educational models and a conscious desire to experiment in a virtual world, endeavouring to create a completely new model for education. This is of course a very different starting point from the more usual range along the continuum from having some activities in a virtual world to support or underpin either existing face to face or distance learning provision. That continuum applies to the largely HE/FE constituency that Moschini describes: SPP ran mostly as a voluntary alternative for teenagers in (compulsory) schooling in the UK, although some teenagers joined through after school clubs (in the US and UK) and at least one group from a classroom with their teacher. As has already been mentioned, Moschini references the "group dynamics" of SL and she outlines many aspects of the already substantial research community. Twining and Footring give many details of the evolving group dynamics of a single community (in the sense of being in one, closed, TSL project) and the chapter makes a considerable contribution to the literature in describing some of the challenges faced and in some cases overcome by a virtual world community of people for the most part not known to one another in the physical world. It is striking that by the end of Phase 1, it was already found necessary to have seven departments of a government structure: Education, Safety, Government Coordination, Scripting, and Building and Planning Permission. Clearly, with all the complexities of "living" in a virtual world, political actions are quick to emerge, in part among struggles for not unlimited resources. Writing of the broader SL community, Boellstorff writes:

> Virtual worlds have often been presented as sites of untrammelled freedom, where humans are released from the shackles of physical embodiment and can reinvent themselves as they choose .... this assessment is inaccurate. Perhaps nowhere is this more clear than with respect to social inequality. The idea of governance assumes some kind of power differential between the governed and those with authority over them. Anthropologists have noted that no human society has existed without some form of inequality; forms of status and authority exist even in 'primitive' societies without private property...To be human, including to be virtually human, is to live in social contexts structured by inequality ... (Boellstorff 2008, pp. 25–26)

Twining and Footring's account makes clear that notwithstanding the egalitarian ethos of the project, differentials existed not simply in terms of status between (adult) "staff" and (teenage) "students" (and indeed these were often muddied through varying levels of expertise) but also arose very quickly among students. For example as the project developed it seemingly became more difficult to encourage new students to build, as both governance and expertise became relatively highly concentrated in a small number of students.

However, what is astonishing is the wide range of activities briefly outlined in this chapter, especially when one considers that this was a closed project and thus relatively isolated from the opportunities to borrow, buy and simply be inspired by developments and events in SL (or even TSL). The project outline given here mentions three curriculum strands: physics; archaeology; and ethics and philosophy, building learning centres, regattas, a skateboard park, machinima, a wedding, a recreation of the Boston Tea Party and much else.

The section on research methodology is an interesting example of the synthesis of research methods that Moschini outlined as feasible in SL. This paper concentrates particularly on interview data, that convey vividly many facets of this ambitious project.

Twining and Footring's analysis of the project involves the creation of a framework of "dimensions of practice". This contribution may be useful not only for the work it does in describing this specific project in a systematic fashion, but in terms of advancing a framework others might find useful, especially if valuing a twenty-first century curriculum of creativity, collaboration and other related values rather than the nowadays much criticised precisely defined individualised measures of achievement against very narrowly defined targets (Partnership for twenty-first century Skills 2004; Leadbeater 2008.) Bringing notions of product and process, bureaucracy vs playfulness, in relation to one another offer stimulating structures whether to influence evaluation or indeed educational intervention design. In terms of the 13 month SPP project, inevitably the broad overview leaves many questions about details of the project hanging; those interested after this reading in the SPP may also wish to read further about the project in Twining (2009) and Gillen et al. (2009).

In Chapter 5, Gillen also focuses on the SPP, taking a specific slant on the project in terms of investigating digital literacies. She expands consideration beyond activities inworld, taking into her purview some of the other communicative domains of the project outlined in the previous chapter: the wiki and the forum. Gillen draws on Boellstorff (2008) to claim a generally ethnographic "take" on the project, reflexively involving consideration of her own participation and her own responses indeed to aspects of the previous chapter. Gillen demonstrates the diverse and complex communicative practices of the project, showing how the affordances of the virtual world, the wiki and the forum are different and get taken up by the participants to shape different purposes. One spontaneous act of collaboration she analyses is the creation of a project dictionary on a wiki; although in terms of content clearly linked to the "group dynamics" of the SPP inworld, there is a sense in which the literacy artefact is relatively free-standing. As a voluntary, carefully crafted artefact revealing both understanding of lexicography and a willingness to innovate creatively, this example may interest some educators as being an instantiation of a persistently valued genre, reshaped for a new context. The chapter then overall offers material in terms of methods and findings for those interested in literacy practices in virtual worlds. Evidence is offered from this project that combats consistently negative representations of young peoples' new communicative practices. In so doing, this account contributes to contemporary arguments that writing and reading are

fundamentally changing, becoming aspects of a more generally semiotic disposition (Kress 2003). Finally, in emphasising the craft involved in communicating in virtual worlds, Gillen contributes to Vannini's (2009) argument that contemporary material ethnography needs to a take a turn to valuing *techne* at least as much as *ethos,* i.e. trace communicative actions as they appear materially, in detail, rather than be overly preoccupied with endeavouring to investigate underlying, actually hidden, attitudes and beliefs.

In Chapter 6, Peachey writes from a perspective of ethnography about her experiences with the social community for The Open University in Second Life. The chapter outlines the development of this community over a 2-year period and Peachey argues that it maps to the physical world location-driven community concept of Third Place, as defined by the urban sociologist Ray Oldenburg (1991). In the field of community building, Third Place is used to describe a social environment that is distinct from the first and second place norms of home and workplace, for example a regularly frequented coffee shop. Oldenburg argues that a Third Place, "...hosts the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work" and is necessary for civil society, democracy, civic engagement and establishing an authentic sense of place within a community. Peachey proposes that by observing and interpreting the student-driven behaviour of the social community she gains an understanding of how users engage in and with the environment, providing valuable insight for input into long term strategy in creating a community of learners for the OU in virtual worlds. The chapter considers the background and context to the development of the OU social community in SL and explores community building in general terms before proposing the Third Place as an appropriate model. The established OU community in Second Life, active enough to support its own learning by organising a variety of special interest and discussion groups as well as social events, demonstrates a significant achievement in using the affordances of a virtual world to overcome some of the core challenges to our student's learning experiences. In addition it has allowed students to enter into learning without social baggage and other disadvantages they may carry in the physical world. The chapter concludes by looking forward to the possible future for this community.

In Chapter 7, Toro-Troconis et al. take their lead from literature on Game-Based Learning to develop learning scenarios where medical students can interact with virtual-patients in Second Life. An important aspect of this work is the development of an alternative web-based implementation of the same set of virtual patients – allowing the authors to compare student reactions to the different environments. Interestingly, both sets of students indicated a reluctance to use virtual patient scenarios in the future, due to a preference for interacting with real patients – although pragmatically it must be recognised that virtual patients do provide greater opportunities for practice and rehearsal. And in this light, it is worth noting that both groups of students recognised the potential of virtual patients for learning, justifying the effort expended in using the different platforms.

Additional findings highlight some of the differences in student attitudes to virtual world and web-based elearning – with greater scepticism attached to the use

of virtual worlds, while the more linear nature of the web-based e-modules created other problems. As the authors note, this interplay of factors is worth further investigation.

Some of the findings reported in the chapter contrast in interesting ways with the following chapter. Where the Toro-Troconis study aimed to replicate a real-world setting as closely as possible, Thackray, et al. in Chapter 8 wanted to evaluate the use of virtual worlds for education in creating learning experiences that would be "difficult, dangerous or impossible" to create in the physical world. Thackray and her co-authors focus their chapter on a range of boundary issues related to teaching and learning in virtual worlds.

Over time, and working with two cohorts of students (and two distinct cohorts of "clients" for student projects), Thackray et al. have used models of the diffusion of innovation to reflect on the current challenges, and to gather insights into the likely users of virtual worlds. This last is a significant factor, important aspects of which are commonly overlooked in studies into the use of virtual worlds in education. That almost all UK universities are now actively utilising virtual worlds in some form can be misleading – as typically only a very small number of staff at any institution is involved in such activity. Thus, tutors adopting SL or other virtual worlds still tend to fall into the category of "innovators", and are not necessarily typical of the majority of tutors in HE. Other members of staff involved in projects using virtual worlds may have limited experience or understanding, and this may impact upon courses and the student experience.

In comparison, students are more likely to fall into more mainstream user categories, and as such may have different expectations and reactions.

If the successes of teaching and learning in virtual worlds are to truly become mainstream, if the platforms are ever to "cross the chasm" into mainstream use, the boundary and challenges issues identified will need addressing – what is inconvenient to an innovator, some challenge to be overcome, may simply be a good reason for a mainstream user to discount and disregard the technology altogether. While not all virtual world platforms are made equal, this chapter is a call to the innovators already using these platforms to more explicitly recognise these issues. While individual educators may not be able to solve most of the issues that exist, with greater awareness of what the problems are, solutions to the most pressing issues are more likely to be developed – either as part of the software or through best practice.

In the following chapter, Livingstone and Bloomfield meet a distinct set of challenges and issues with a project that has as its goal the merger of the innovative and the mainstream. The SLOODLE project is attempting to integrate virtual world and web-based virtual learning environment technologies, and core to this project is finding out from educators active in Second Life how such integration might be useful – by asking educators what possible features they think would be useful, and by releasing working software and gathering feedback from tutors after they have completed teaching classes using the SLOODLE tools.

A variety of methods and approaches have been used in this work over the past 2 years, qualitative and quantitative, synchronous and asynchronous, and the challenges faced include many that may be met by other studies which need to engage users of a virtual world across long periods of time and over large geographical distances.

In this project, it has not been sufficient to launch a web-based (or in-world) survey and sit back to collect data. To help refine ideas over time and engage user participation in the design of SLOODLE, it has been necessary to conceptualise SLOODLE as a product, as a research project and, vitally, as a community.

This has not all been straightforward. Seeking feedback from users in a pilot using discussion forums and inworld focus groups found that many participants who signed up for the pilot were either unable to attend meetings due to time-zone differences or workloads, and technical issues with the virtual world platform prevented some participants from being adequately able to trial SLOODLE – presenting echoes of many of the boundary issues identified by Thackray et al. in the previous chapter.

A second pilot was established taking many of these issues into account and, while the full results of this are not yet available, has been able to overcome some of the earlier problems. As such, it is hoped by the authors that this chapter can provide some useful guidance and highlight a number of issues to other researchers planning evaluations of virtual world projects with globally distributed participants, or over longer periods of time.

In the closing chapter Bell, Smith-Robbins and Withnail link the sometimes controversial notion of fun with learning in social virtual worlds. Traditional studies of fun and learning center around using games to teach. This can translate to game-related virtual worlds like MMORPGs but what about social virtual worlds like Second Life? The chapter explores definitions of fun in relation to learning before the authors consider social virtual worlds and explore what can be fun in these spaces which are devoid of game mechanics, particularly drawing on the work of Castronova (2005, 2008). Second Life has no challenges, rewards or other levels of achievement usually inherent in a game so this chapter explains how users have fun in a social virtual world. The authors propose that fun is achieved through recreating games, playing at business, identity play and social interactions. The chapter concludes with suggestions of how to use these forms of fun to create appropriate learning environments in social virtual worlds.

We very much hope that there is something in these pages for everyone interested in researching learning in virtual worlds, whether you are in the (dare-we-say aging) vanguard of the early adopters, or have come very recently to the field. In 2009 the Virtual World Watch study in the UK (Kirriemuir, 2009) found that there is only one higher education institution that does not now have a presence in a virtual world. The entire body of HEIs in the UK has made this move in just 3 years, indicating a belief that there is massive potential for learning in these environments but that there is little academic foundation underpinning the design of learning experiences. It is vital that researchers continue to explore learning in virtual worlds, and equally vital that we can learn from each other the tools and methods for our practice.

ReLIVE08 Conference Acknowledgments

As noted at the beginning, this book follows the ReLIVE08 conference that was held at the Open University in Milton Keynes in November 2008. We would like to take this opportunity to thank all who helped make this conference the success it was.

As Chair of ReLIVE08, Anna Peachey would like to get megalomaniacal one last time and take this opportunity to personally express the following:

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- Dr Shailey Minocha, Senior Lecturer in Computing, The Open University
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Chapter 1
Virtual Environments: Issues and Opportunities for Researching Inclusive Educational Practices

Kieron Sheehy

Abstract This chapter argues that virtual environments offer new research areas for those concerned with inclusive education. Further, it proposes that they also present opportunities for developing increasingly inclusive research processes. This chapter considers how researchers might approach researching some of these affordances. It discusses the relationship between specific features of inclusive pedagogy, derived from an international systematic literature review, and the affordances of different forms of virtual characters and environments. Examples are drawn from research in Second Life™ (SL), virtual tutors and augmented reality. In doing this, the chapter challenges a simplistic notion of isolated physical and virtual worlds and, in the context of inclusion, between the practice of research and the research topic itself. There are a growing number of virtual worlds in which identified educational activities are taking place, or whose activities are being noted for their educational merit. These encompasses non-themed worlds such as SL and Active Worlds, game based worlds such as World of Warcraft and Runescape, and even Club Penguin, a themed virtual where younger players interact through a variety of Penguin themed environments and activities. It has been argued that these spaces, outside traditional education, are able to offer pedagogical insights (Twining 2009) i.e. that these global virtual communities have been identified as being useful as creative educational environments (Delwiche 2006; Sheehy 2009). This chapter will explore how researchers might use these spaces to investigative and create inclusive educational experiences for learners. In order to do this the chapter considers three interrelated issues: What is inclusive education?; How might inclusive education influence virtual world research? And, what might inclusive education look like in virtual worlds?

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1.1 What is Inclusive Education?

At first glance this might seem to be a relatively straightforward question to address. There are established international agreements that indicate what this type of education involves. For example a situation in which:

> all children have the right to be educated on equal terms with their contemporaries, regardless of their physical, intellectual, emotional, social, linguistic or any other condition. (UNESCO 1999)

This presents a vision of a diverse range of learners working together. They are not segregated or divided from one another on the basis of labels of impairment, gender, ability or race. Such "access for all" is underpinned by a notion of social justice and access equal educational opportunities (Cole 2006). In this respect separate can never be equal. Inclusive education assumes that diverse groups of pupils are of equal worth and have a right to be included (Open University 2005). However, our traditional educational practices often reflect "industrial age" thinking and practices (Slaughter 2002), characterised by categorisation and segregation.

This contrast, between a vision of inclusive education and established practice, suggests that developments in inclusive education would challenge existing educational structures. The degree to which this challenge has succeeded in producing any systemic change is however debatable (Daniels and Porter 2007). The education system seems to be resistant to change in the face of inclusive policies and the "most significant technological revolution since the move from oral to print methods" (Best and Kellner 2001). It can be argued that despite the implementation of inclusive education policies and a public perception that such segregated special schools have largely disappeared (BBC 2005) the proportion of children attending segregated special school within the United Kingdom has actually increased. One reason for this situation is the way in the inclusion has been reconstructed by researchers and policy makers. It is easy for researchers to adopt a "medical model" view of learners, which promotes a within-child deficit perspective. This discourse tends to minimise social and environmental influences on the individuals' learning. As a consequence the practice of previous years can be recreated in new technological spaces. We construct our practices around categories of deficit and difference. Consider this example of a vision of a "future school"

> The year is 2015. You enter a school. From the outside, it appears to be much the same physical structure as schools were for 50 years. But inside is a totally different world. Teachers are busily meeting with one another and engaged in e-learning to stay current on the latest developments in education and their disciplines ... Science teachers are working in a cross-disciplinary program that has been particularly fruitful – NBIC – a wonderful stew of nanotechnology, biotechnology, information technology, and cognitive technologies ... A number of special needs students are working in rooms, receiving cues from a wireless network that are appropriate for their individual cognitive and physical needs as developed through NBIC ... Each student in the community can interact with other students worldwide to share information, language, and culture. While the student population of more than 50 million students has been joined by millions of parents as lifelong learning requirements

> are realized, no new buildings have been required, as many students take advantage of 24/7 availability of coursework at their homes, in work areas, and at the school. (Batterson and Pope 2003)

At first glance this might seem to be a very positive situation. We have collaborative and lifelong learning within a global learning community. But one group of students remains labelled by their "needs", and segregated from the rest of the school (Open University 2005). As we will see this segregation is not necessary in virtual worlds, but there is a danger that research practices will recreate them. If virtual world technologies are to work as inclusive spaces then educationalists need to critically reflect upon what they want to achieve with education, be careful of recreating special schools in cyberspace and to explore how technology might be used in creative and productive ways within this endeavour (Kellner 2000). The enactment of inclusive education is a contested ground; "the term can mean different things to people who have varied investments in how it is constructed and enacted, and hence researched" (Sheehy et al. 2004). Some researchers see it as going beyond special needs or physical impairments and encompassing any learners at risk of marginalisation or exclusion. Other researchers would focus on inclusion as "access" to the curriculum, knowledge or peer groups. This latter approach has led to researchers who would see their work as developing inclusive educational practices from within, for example, segregated special schools. This issue is particularly pertinent to educational virtual worlds wherein groups of learners can mix inworld but remain segregated in their physical worlds, and physical lives. Researchers will need to reflect on the extent to which they feel that these environments are promoting inclusion, through social and curricula access or undermining the development of inclusion in the physical world. As virtual worlds become an increasingly integral part of people's social networks, with inworld, online friendships and interactions approaching the significance of physical world interactions (Sheehy 2010) then this issue become more complex. Virtual inclusion can no longer necessarily be seen as a "poor relation" to physical world inclusion. Virtual inclusion matters, and this underlines the importance of looking at the values which underpin our research.

1.2 How Might Inclusive Education Influence Virtual World Research?

If we are seeking as researchers to develop new inclusive places, pedagogies and practices then a question arises of whether the research practices which helped develop non-inclusive educational environments still apply? It has been argued that moving towards inclusive education should significantly influence the way in which we carry out research (Thomas and Glenny 2002; Slee 1998). Indeed it has been stated that inclusive education "must signify new times for educational research" (Slee 1998). A key issue is that if we are seeking a "learning for all" situation then researchers will need to consider the extent to which the "research process itself be in the hands of those researched and primarily for the benefit of these groups"

(Sheehy 2005). There are a growing number of innovative virtual places which are run by disabled people or those excluded from particular activities in the physical world. These span virtual nightclubs where the barriers to those with physical impairments are reduced, if not removed, to explicitly educational spaces run by people with mental health issues or difficulties in communication. There is a danger that researchers who are not contributing members of these inworld communities may collect data through "RAM Raiding" (Sheehy et al. 2008; Sheehy 2009), taking their data and leaving. This is practice is made easy for researchers as we can alter our avatars appearance or even record behaviour and interactions covertly to gain access to a community. It can be argued that in developing inclusive educational practices we should therefore use inclusive approaches in our research methods. This is a more ethical way to proceed. This idea is relatively new in physical world research but models for researchers to consider do exist. For example, Walmsley has helped develop this approach for researching with people with learning difficulties, a group who would previously have been completely excluded from this sphere of activity. She introduces the new term "inclusive research" to broadly describe her own work and research "in which people with learning difficulties are involved as more than just research subjects or respondents" (Walmsley 2001). These are people, she argues, who have had their voices almost universally silenced until the relatively recent advent of their roles as co-researchers, interviewers, life historians and autobiographers in inclusive research. Walmsley's contribution is important because her "inclusive research" is inclusive of research that involves people with learning difficulties participating, as part of a team approach, with non-disabled allies when they themselves are unable to be in control. She points out that by prioritising the importance of disabled people taking power, such emancipatory research can (inadvertently) exclude people with more profound impairments. She also raises the sensitive question of whether non-disabled allies should act as citizen advocates or whether "they have the right to a voice which differs from that of their disabled colleagues" (Walmsley 2001).

So this area can be seen as presenting opportunities for researchers in creating new ways of working but also raises challenges in how to research effectively using inclusive research practices. An obvious issue concerns negotiating the power relationships involved in managing the technological and financial barriers which need to be overcome in setting up and running virtual environments. Another, concerns the different agenda that a researcher may bring to a community, in particular the need to demonstrate funding acquisition and produce academic publications and outputs. There may therefore be a conflict of priorities for the "inclusive researcher".

Similar issues arise when considering how to research virtual educational environments for children. In the physical world, Morgan et al. (2002) argues that only relatively recently have the voices of children and young people been seen as important in relation to their own learning (Morgan et al. 2002) and this is now emerging in government publications (Rudduck 2006.

> …. there have been relatively few studies of schooling from the learner's point of view (Rudduck 2006) and such research has often revealed a gulf between children's views and those of adults (Morgan et al. 2002). This implies a need which might underpin a

> recent growth of interest in pupils' voice. Hence models of, and research which develops, learner consultation within educational environments are now emerging, for example, the 'Consulting Pupils about Teaching and Learning Project' (Rudduck 2006). As McIntyre, Pedder, and Rudduck state 'It cannot tenably be claimed that schooling is primarily intended to benefit pupils if pupils' own views about what is beneficial to them are not actively sought and attended to' (2005). (Sheehy and Bucknall 2008)

Giving space to the voices learners could potentially support more inclusive research practice. It increases learner engagement, promotes personalised learning, and gives educational "consumers" their right to influence the services they receive (Rudd et al. 2006). We can see strong parallels here with Walmsley's work, as young people's voices are not often given power in research seeking to develop virtual learning spaces. Although a range of methods for promoting the voice of the learner are developing, currently, "examples of good practice remain relatively rare. In many cases learners are consulted through 'formal' and 'traditional' methods on issues predetermined by the school and staff " (Rudd et al. 2006). It appears that the population with potentially the most experience of virtual worlds are not being consulted widely, or given influence in, developing virtual educational environments (Ferguson and Sheehy 2010). Whilst the researcher in the virtual world therefore has an opportunity to develop research practices which support the development of inclusive practices there is the danger that the models of research which they use may support non-inclusive approaches to education and the production of knowledge. If we support the view that young people, and indeed all learners, have a right to influence the decision and practices that shape their lives, then the advent of virtual worlds presents an opportunity to seek learners' perspectives and opinions from the beginning. An inclusive approach might go beyond consultation and help empower learners in the research approach itself. As we will see in the next section virtual worlds have particular affordances which can support this.

1.3 What Might Inclusive Education Look Like in Virtual Worlds?

Having suggested that researchers should actively seek to bring inclusive values into educational research practices, this part of the chapter will consider which features of inclusive pedagogy might be important to address within our research. One way to approach this is to consider the features of physical world classrooms that are associated with inclusive educational practices and then discuss how these might be transferred, transformed or created within virtual spaces (Sheehy 2010). Hopefully this approach will avoid recreating "grammar schools in Second Life", where physical world barriers act to immediately exclude particular groups of learners.

It has proved challenging for those developing inclusive education to highlight and disseminate pedagogical practices which could include a diverse group of pupils effectively. However, examples which offer some insights into inclusive pedagogies do exist and the extent to which these practices can be delivered, developed or denied within virtual environments would seem an appropriate research

area. During the period of 2003–2007 a series of three linked systematic literature reviews were conducted. The overarching review question was "What pedagogical approaches can effectively include children with special educational needs in mainstream classrooms?" with different sub questions asked for each year. The review team considered 3,462 research papers before applying selection criteria in relation to positive educational outcomes (Sheehy et al. 2009). In terms of identifying the nature of inclusive educational practices, synthesis of the research lead to the identification of five emerging themes in the final year (Sheehy et al. 2009):

- pedagogic community
- social engagement being intrinsic to the pedagogy
- flexible modes of representing activities
- progressive scaffolding of classroom activities
- the authenticity of classroom activities.

The first point "pedagogic community" is of particular interest to this chapter, given its focus on researching. Sheehy and Rix saw this as communities that contained and shared an informed perspective of how pupils learn and how learning is facilitated. This perspective is developed and supported through access to a group who share these pedagogic beliefs and offers support through discussion or training. In this way the community creates knowledge that is valued by its members. One feature noted in the examples of such communities was a strong relationship between researchers and teachers. This is clearly going to be found in a review of published classroom-based research, however it does suggest that researchers and teachers can work successfully together to develop inclusive educational practices and both contribute to a pedagogical community. In these cases the community's focus was on a particular curriculum area (for example science or history), rather than beginning with a focus on labelled group of learners and their "deficits".

The Schome group explicitly set out to use a virtual world as a site for the exploration of new pedagogies (Schome Community 2007). As well as identifying physical world social barriers to access they found that there was a pressure from funders to impose existing physical world teaching practices. However, within the virtual environment the young people themselves were able to subvert these (for example the use of formal induction sessions) and began to gain a direct involvement in their learning, influencing the manner and topics which they learned to a considerable degree. Some of the learners were clearly part of developing the pedagogic community rather than being the recipient of practices and outcomes. For disabled learners also virtual worlds have the potential to give greater control over the way they are taught, if they are enabled to have equal access in the first place. Whilst some disabled people are owning and developing virtual spaces these are often focussed on "education about a disability" or a space for a group to meet. There is some evidence to suggest that disabled users and the educational communities are assumed to be distinct virtual communities (Carr 2008). The same distinction might also occur regarding disabled users and research communities. A recent attempt to explicitly challenge this division might be seen in ProjectPossibility, a

open source software "community of person with disabilities and software developers" (www.projectpossibility.org). It will be interesting to see how such initiatives develop and the extent to which an inclusive research approach is fostered, and their impact within virtual world design and usage.

Innovative inclusive spaces might therefore be predicted to develop outside of the "designated" educational ones. A key (research) issue will be the place and power of disabled learners in developing virtual pedagogical communities.

Social engagement refers to learning experiences in which social engagement is held to be the site for the creation of knowledge. There is a large body of empirical evidence to support such approaches (Galton et al. 2009). These emphasise the friendship and social relations aspects of the classroom as important in their own right, and there is evidence that they can also achieve significant "academic outcomes" (Howe and Mercer 2007). Avatar mediated interactions can facilitate social verbal and non-verbal communication skills (Babu et al. 2007) and this suggests that social pedagogical approaches might become useful virtual world pedagogies. For example Interloc is a text-chat environment where learners, interactions are scaffolded by a vocabulary which they choose from within a dialectical discussion "game" (Ravenscroft and McAlister 2006). This scaffolding of "talk" would transfer well to larger scale avatar populated worlds and could be particularly helpful in scaffolding the interactions of people with learning difficulties. Anyone who has played entry level on virtual worlds such as Runescape or Club Penguin will be familiar with using set phrases for communication and so this established affordance of virtual worlds could be developed. Another "dialogic" approach (Ravenscroft et al. 2007), locates its merit in enabling the learner to consider other people's perspectives and roles. Again, virtual worlds are ideal environments for such activities, and can help to mediate and influence children's use of language, provide an opportunity for them to try out alternative social inter-actions and reflect upon their feelings and thoughts (Sheehy and Ferguson 2008). Researchers will need to explore how this social "talk" scaffolding could be utilised, without undermining the essential enjoyment of the environment. Successful inclusive pedagogies use, monitor and develop the learners' social interactions as a way of developing, or facilitating the development, of knowledge. Virtual worlds allow researchers to, relatively easily, collect more "learner data" than has been possible in the traditional classroom (Sheehy et al. 2008). This could be used to inform the application of these social constructivist approaches with a finesse not previously possible. Researchers may be able to develop an understanding of the factors which best support virtual learners in reflecting on their own interactions, problem solving and knowledge within a particular curriculum area or social context. In transferring set phrases and structures, researcher will need to consider the values contained within them. Again it is essential that researchers work as part of community with an insight into this issue, and avoid recreating a language of exclusion inworld.

For some learners, for example those with Autism, the social environment of the traditional classroom is challenging. Research on Brigadoon, an island in SL, suggested that this type of environment had some beneficial features for autistic people (Biever 2007). The relative lack of potentially misreadable subtle facial

communication and also a slower pace to social interactions, gave more time to understand comments and formulate appropriate replies. The social interactions, and therefore the potential use of social pedagogies, become more accessible for these learners in virtual environments. However, this assumes the option of text based communication through relatively simple avatars. Both of these aspects can, and are likely to change.

Avatars, in different virtual worlds, can communicate via text, voice, signing (Adamo and Villiami 2007) or symbols (Sheehy 2003). This choice suggests the possibility of more inclusive communities. However, in the larger worlds there is the potential for conflict over the mode of communication, for example the status of non-voice players in World of Warcraft (Sheehy 2010) or the relative neglect of the Deaf communities position regarding the roll out of Voice in SL (Carr, Chapter 2 this volume). At a more fundamental level some learners may be denied access to virtual education because of the perceptions of their carers and guardians regarding the status of virtual social interactions. It has been suggested that virtual worlds have significant potential for supporting young adults with severe learning difficulties: rules and abstract concepts can be made comprehensible through additional language and symbol support, skills, such as navigation, can enhance physical world abilities (Rose et al. 2002). At a recent workshop some young adults who had never visited a virtual world (SL in this case) successfully used their avatars to communicate, create objects and interact. In the post session debriefings they mentioned that they had enjoyed themselves, would like to do this sort of thing again and how it would be a good place to meet up with their friends. However, their careers saw this type of virtual world as being a "play activity" with little educational or social potential, and as an unnecessary distraction from "fresh air" exercise. Attitudes towards virtual worlds and modes of communication are therefore an important issue for researchers to explore. These attitudes can create a barrier which disempowered groups may not be able to overcome, should they wish to.

A third factor, flexible modes of representing activities, refers to the affordance of presenting activities and interactions through different modalities: visual text-based, verbal or kinesthetic. Being able to manipulate the modality of teaching materials can act to improve curriculum access for a diverse range of learners. For example the "Accessibility In Virtual Worlds" project used an Active Worlds environment in which items were described and their positions indicated by sound, enabling navigation by blind students and such approaches are beginning to emerge allowing blind students to interact with sighted peers in virtual worlds and games (Sheehy 2010). Cobb and Sharkey (2007) provide a good overview of the considerable range of research that has developed in this area. Their review notes multi-sensory and acoustic environments, some of which act to transform our conceptualisation of virtual environments.

Brooks et al. showed that the term "virtual environments" need not be restricted to a limited notion of an architecturally understandable space, but can be realized as a more visually and sonically abstract space that can enhance quality of life for severely disabled children. Referred to as "aesthetic resonance environments", these have been used effectively to support body awareness and movement in children with severe neuro-motor disabilities (Cobb and Sharkey 2007, p 53).

This is an interesting area for inclusive education researchers to explore. The virtual worlds which we currently build bear very strong resemblance to the physical world. This ranges from the recreation of buildings, landscapes to undersea, or alien or futuristic landscapes. There is spatial navigation, location and representation. Indeed, this appears to be a significant part of their appeal. But research into the potential of other representations may offer alternatives.

Meanwhile researchers are developing a variety of means through which "traditional" virtual worlds can be accessed and activities be engaged with. These encompass eye tracking, body movement, brain wave monitors, platforms, gloves, voice control and a range of adapted keyboards and input devices such as joysticks. This makes it possible for learners to engage with activities inside virtual worlds which would, currently, be impossible for them in the physical world. They are able to choose actions and interactions for their avatars, a choice which does not exist elsewhere, and receive feedback from "force-reflecting, haptic and tactile technologies" (Cobb and Sharkey 2007). The impact of these new choices on learning is a new area for educational researchers to begin to explore.

This choice of modalities also extends to how work is presented and shared. In physical world classrooms manipulating objects to discuss and solve, for example, mathematical problems allows learners to share and "see" the thinking of others. "The teacher can have a direct view of the strategies and heuristics used by learners in solving problems and thereby monitor, or facilitate, their progress in mathematical thinking" (Sheehy et al. 2009). This is also possible inworld and learners can present their work and ideas in different ways, through machinima presentations (Schome Community 2007), inworld objects or graphical interfaces. Currently, virtual world modalities are typically limited to visual and auditory modes, although haptic approaches have been being developed for some time (Colwell et al. 1998). For some learners, such as those with profound and multiple disabilities, increased kinaesthetic options are needed. For other learners the current confinement of movements created when accessing virtual classrooms (as indicated in Cobb and Sharkey (2007) is not a positive feature. The limitations of virtual environments are considered in the TEALEAF frame-work (Teacher Embodiment and Learner Affordances) (Sheehy 2010). This maps out four areas which describe the possibilities of different teacher embodiment and virtual learning environments. So far we have discussed research in only one of these four areas: a virtual teacher and avatar in a virtual environment. However, another "area" of TEALEAF is that of virtual tutors in physical spaces.

This area seems to present many new opportunities for researchers exploring inclusive practices. An example of this would be "Sam", who acts as a virtual peer. He is a 2D projection onto a surface within a child's classroom. He is surrounded by physical world objects which the child manipulates and responds to the child's behaviour. For some disabled children, Sam has more success than their physical world peers in helping them develop contingent social responses (Cassell and Tartaro 2007). This type of situation has some advantages of using an avatar, such as having the "patience and reliability of an AI bot" (Sheehy 2010) moreover the learner can interact with physical, tactile objects and engage a fuller range of senses. Similarly a Baldi (a virtual character) application is being developed to

interact with children with autism, and little or no speech, through symbols that are manipulated in the physical world (Herring et al. 2009). This research is also considering the nature of the character which best facilitates the children's learning. Augmented reality applications allow learners to work and collaborate through virtual or physical objects, and gives the option of communicating through either natural expressions, or avatar mediated ones. Those researchers seeking to develop inclusive educational practices might reflect on the extent to which using an AI teacher (Herring et al. 2009) or peer (Cassell and Tartaro 2007) is an appropriate approach. On might argue that for children with already limited social interactions this line of research acts to remove them further from the social sphere.

The fourth factor, progressive scaffolding, refers to the type of support given to learners and the degree of support is moderated as learners become competent in a task or with a concept. Augmentation of the physical world decreases the difference between virtual and augmented spaces (Goldiez 2004), and allows the virtual worlds to step out of the screen in to the physical world. This not only increases the sensory experiences of learners but also enables some of the scaffolding potential of virtual worlds to directly support physical world activities and potentially to be accessible on demand. This might provide visual or auditory support to learners engaged in a particular activity, allowing them to successfully complete a physical world task. Initial work by Richard et al. (2007) suggests that children with learning disabilities engage well with Augmented Reality (AR) and are motivated in using it. Arguments about the virtual inclusion acting to support physical world exclusion might be undermined by such developments.

An interesting issue for inclusive education researchers emerges here. So far evidence has been presented which suggested that the affordances of virtual world gives them the potential to be far more inclusive than physical world practices have been. (If the risk that exclusionary practices are transferred into virtual research and development is avoided). As AR develops we will be able to "export" these affordances into the physical world, where they will run up against tradi-tional pedagogic practices. How this impacts upon these practices will be an important area for future research.

Moving into a world scaffolded by virtual augmentation raises the question of which platforms to use and which are most accessible. In research that examined the experiences of young people designated as NEETS (not in education, employment of training) a lack of computer use was indicated (Sheehy and Kumrai 2008). However, this might not apply to mobile phones or internet enabled game consoles. Recent developments have shown that AR via handheld devices can provide engaging educational experiences (FUTURELAB 2008) and it could be that these are more accessible than computers and enable more flexibility in interacting with materials. At one level this might allow people who experience difficulties reading traditional text (or indeed anyone else) to have text read to them through their mobile phones (for example products such as Capturatalk (2009) work on Windows mobile phones). At another level ambient computing can offer site sensitive support, from mobile devices, for people as they move around the physical world. Researching the nature and appropriate level of this new, and potentially "on demand", support in

educational activities will be an interesting area for future research. Avatars already exist to read news online, to interact or offer inworld support as non-player characters. Researchers are now examining the avatar features e.g. their appearance and behaviour, which best support learners (Sheehy 2010). It may be that AR avatars accompany learners into the physical world (Sheehy 2010) and that, as indicated previously, the relative levels of interaction between real and virtual peers becomes a key issue for inclusion both in future schools and across society in general. This debate is already beginning to take shape in virtual world communities via articles such as "Why digital avatars make the best teachers" (Bailenson 2008). This documents the advantage that AI avatars have in supporting all learners in a digital i.e. virtual classroom. Research will reveal whether these positive features transfer to the physical world via AR. Researchers will not be passive observers and analysts of this process but the way in which they conduct their research will shape the outcomes.

Lastly, there is the issue of the authenticity of the learning activity. This relates to situations in which an activity is meaningful to the learner and which might also reflect a "real life" skill or activity. Virtual activities may also be authentic in terms of knowledge valued by the "pedagogic community". The Schome group pilot project, working in the Teen Grid in SL, developed a range of inworld activities that might be seen as authentic practices within the scientific community, for example running physics experiments, discussing governance and submitting proposals to create a satellite based measurement of Earthshine (Schome Community 2007; Schome wiki 2008). The virtual environment facilitated the development of these authentic activities, and they might not have occurred for the participants without it.

In the session with young adults with severe learning difficulties, mentioned previously, our discussion suggested that they saw virtual worlds as being "like a Play Station game". They had experience of these games and being able to "do" them was valued by them. The potential to communicate with friends online was similarly a real part, or desired part, of their lives. To see their experience as "irrelevant play" would be to misunderstand the place of similar activities in their lives. Playing virtual "games" is an authentic activity for millions of people. Not only might virtual world skills may be relevant to developing information age skills (Sheehy and Ferguson 2008), but they can have authenticity in their own right. This view raises an important research issue. Virtual worlds can give access to representations of physical word experiences, to which learners are denied. This denial may be because of the fear of risk by carers or due to access difficulties (Cooke et al. 2002). In contrast, for other social groups, the lack of dangerous consequences has established their use in a range of training actives for high risk physical world roles. In these professional settings virtual experiences are a precursor to physical world involvement. For disabled and disadvantaged groups the question is raised here as to whether such "virtual reconstruction" will be used to open up educational opportunities, provide authentic alternatives, or further a denial of access to physical world activities. We already consider social networking and SatNavs to be unremarkable. These technologies are not a "next step" in learning to communicate or navigate "properly" and the same unremarkableness will begin to apply to other VW/AR

related technologies. As virtual world technology becomes a larger part of our lives the use of this support will become commonplace. A broader and more diverse range of people will potentially be able to communicate and learn through them.

1.4 Conclusion

Whilst the majority of educational researchers would agree with the values underpinning inclusive education, the actual development of inclusive educational practices appears to have stalled in the physical world.

However many of these barriers can be overcome inside virtual environments, and examples of social inclusion are now emerging from virtual worlds. These examples are potentially helpful to researchers seeking to understand the nature of inclusion and virtuality. In exploring these issues researchers need to consider the values that underpin their practice and seek to collaborate with, and work for, the interests of previously disempowered or excluded groups. This presents opportunities for developing new research practices in spaces that are, potentially, accessible to a more diverse group of learners than ever before. That learner's voices should inform the development of virtual educational practices is essential and potential models for such practices are emerging. Researchers now have the opportunity to develop, and model, inclusive research practices in virtual worlds.

Virtual worlds seem well placed as sites for researching inclusive educational practices in that they are able not only to deliver features which can support a diverse population, but can do this in ways which have not been possible before. Applied research will help us to understand how these features interact and may be optimised for the benefit of all learners.

The discussion in this chapter has largely downplayed the technical and social barriers which will need to be overcome, for example the economic barriers which delineate possession and usage of virtual technologies (Sheehy 2003). Currently it can be argued that disabled learners, who might have the most to gain from virtual technologies, have amongst the lowest rates of usage of such technologies and this lack of access is related to low income (Kaye 2000). That virtual words are not part of young people's formal educational experiences exacerbates this situation. Crucially, researchers who wish to develop inclusive educational practices in virtual and augmented worlds will need to consider the values underpinning inclusive education and reflect this in their both their focus and practices. The creativity and opportunities offered by as virtual worlds make it imperative that educationalists critically reflect upon what they want to achieve with education and how technology might be used in creative and productive ways within this endeavour (Kellner 2000). That virtual environments could be a significant factor in transforming pedagogy seems likely. Longer term it will be interesting to research whether these inclusive affordances can transfer to the augmented physical world and influence inclusive practice there.

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Chapter 2
Learning, Teaching and Ambiguity in Virtual Worlds

Diane Carr, Martin Oliver, and Andrew Burn

Abstract What might online communities and informal learning practices teach us about virtual world pedagogy? In this chapter we describe a research project in which learning practices in online worlds such as World of Warcraft and Second Life™ (SL) were investigated. Working within an action research framework, we employed a range of methods to investigate how members of online communities define the worlds they encounter, negotiate the terms of participation, and manage the incremental complexity of game worlds. The implications of such practices for online pedagogy were then explored through teaching in SL. SL eludes simple definitions. Users, or "residents", of SL partake of a range of pleasures and activities – socialising, building, creating and exhibiting art, playing games, exploring, shopping, or running a business, for instance. We argue that the variable nature of SL gives rise to degrees of ambiguity. This ambiguity impacts on inworld social practices, and has significant implications for online teaching and learning.

2.1 Background: The "Learning from Online Worlds" Project

This chapter focuses on research undertaken during a small project called "Learning from Online Worlds; Teaching in Second Life". This project involved the investigation of learning practices in online worlds and the extension of this work through the design and delivery of taught classes in Second Life™ (SL). The project's aims included theorising the learning that happens in social worlds, exploring how any such learning might inform teaching in virtual worlds, and investigating the various cultural factors (such as subjectivity and identity) that might impact on pedagogy in these contexts.

Given that there was a relative shortage of available research that might provide a theoretical grounding for the project, an action research approach was adopted

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(Zuber-Skerrit, 1992). This provided a framework in which experience could be gained, theorised and used to plan further investigation in a structured yet emergent manner. The first iteration of the action research process was primarily of value in establishing the issues that the remainder of the project should pursue.

The first phase of the research was thus experiential, and began with exploring SL as users. We socialised, attended seminars and meetings, experimented with in-world creative practices (from making clothes, to creating machinima), and kept "game diaries" of our experiences, which allowed us to move into a reflective phase of work. The following is a sample of this early material:

> [I've been spending time on the] customising of my avatar. It's easy, quick, and the improvements are obvious. That leads to learning (the acquisition of a basic familiarity with the edit appearance settings, the inventory). And from there to despair ('oh, I look like a duck') and from despair to shopping, and from shopping to freebies [. . .] In retrospect I think of this as my pre 'pain barrier' phase [. . .] Because I battered away and persevered [. . .] I eventually scraped some skills together and stumbled across this pain barrier, at which point SL became funny, enjoyable and potentially interesting. (DC's 'game diary' March–June 07)

The team compared diaries, and as a theorising and planning step, identified a set of issues relevant to the project's central questions. These issues included:

- Expertise (how is it demonstrated, measured or performance?)
- Conventions (socially produced) relating to expertise, identity, etiquette, trust, etc.
- Learning curves and the "*Second Life* pain barrier"
- Credibility, "noobs" (new users) and hostility or "gatekeeping"
- Self-presentation, representation.
- Drama and performance
- Public spaces, social constructions and ritual spaces (the "magic circle")
- Voice and access issues
- Creative and collaborative practices (such as machinima).

These issues were then explored in greater depth through particular research activities, each of which built on the previous iterations of the research process.

We referred to the emerging research in this area, including educators' blogs, wikis, reports (such as Kirriemuir, 2008) and conference proceedings (such as the annual Second Life Community Conference Education Track, see Livingstone and Kemp 2006, 2007). At this stage much of the reportage is exploratory, and remains difficult to coherently review due to the range of educational contexts (from classroom based building work, to distance learners' media production, for example) and the variety of learners (from children to adults), as well as the diversity of disciplinary affiliations and perspectives of those engaged in research (from computer sciences to media practice for instance). These resources are, however, evidence of the amount of interest in this area, and the range of work being undertaken. In addition to reviewing this material we drew on literature from digital game studies, media and cultural studies, Internet studies, drama education theory; ICT and education research, and communities of practice theory (Wenger 1998).

2.2 Defining Second Life; Doing Second Life Research

During our individual experiences we had identified an initial period in which using SL was frustrating, even annoying; this "pain barrier" had to be overcome before we felt comfortable as users of the environment. We provisionally defined this pain barrier as the moment when sufficient learning or competence has been accrued to tip the new user from bafflement and annoyance, to pleasure, or even "flow" (Csikszentmihalyi, 1990).

Given that most of our students would be entering SL for the first time, and would be doing so at our instigation, we had an obligation to understand the difficulties posed by this virtual world for beginners. Such difficulties included issues about the interface, as well as the public and potentially intimidating nature of this virtual world. Additionally, we expected that an understanding of the pleasures and the potential frustrations of SL should inform the planning of our classes.

First we needed to ascertain if pain barrier experiences were at all commonplace. To find out we proposed to gather short accounts of the journey from newbie to resident, from self-described residents. We wished to be non-intrusive, and thus we posted a message identifying ourselves and making our request at a SL forum, rather than approaching subjects inworld. Requests from students and researchers are common at the various SL forums. Here is a sample response in which a pain barrier moment is described, while pleasure and frustration are attributed to particular aspects of SL. SV wrote that

> [at first] I hated it! [. . .] All I saw was walls! I had no idea what was where, it was totally disorientating! [. . .] I just couldn't get used to it. It was only when one of the guys I came here to be with from the old chat [room] asked me to come in for another's birthday that I did and it just clicked, it was then, in March, I felt 'right', it all came together. (SV by email)

This response suggests that there is value in the notion of a pain barrier. Meanwhile, however, a dozen contributors at the forum had responded to the eliciting message with scepticism or outright disbelief. Posters suspected, for instance, that our message was from impostors engaged in some form of "scam". Furthermore, it was suggested that we were not conducting *proper* research which (as some of the posters explained) involves clinics, large amounts of data and/or observing people without their knowledge in order to "get at the truth". While these forum responses were of limited value in relation to our interest in the idea of a SL pain barrier, they were intriguing in terms of our interest in hostility, control and credibility in virtual communities. We were also interested in the respondents' comments about research.

Prompted by the forum respondents' suggestions as to what constitutes "proper research" we found ourselves reflecting on the manner in which we ourselves had implicitly constructed SL in this instance. We had focused on the experiences of individuals, and had assumed a "human subject model" (see Bassett and O'Riordan, 2002). What alternative approaches might there be to the analysis of hostility, territorialism, community or credibility in SL?

One alternative would be to analyse these issues while conceptualising SL as a "collective text". Within this text, particular discourses emerge and circulate. Within this discourse, certain constructs or agencies might emerge. For example, an agency – invisible, vague yet omniscient – could manifest in discourse as "we" or a "them", as "the community" or an "everyone". Such agencies would function as figures or reference points, and would be used by participants attempting to, for instance, establish the terms of legitimate (and hence illegitimate) participation. The point of these speculations is not just to suggest the value of alternative methodological approaches to virtual worlds. What this is intended to highlight is the potentially circular relationship between a preferred yet perhaps implicit definition of SL, and research-as-practice.

SL can be used in various ways and thus there is scope to define it in various ways (as collective text, programme, social networking platform, tool, public space, etc.). This suggests that definitions will be provisional, and reflect the perspective of the user (or the disciplinary perspective of the researcher). The preferred definition of SL will inform the research questions that are devised, and the methodologies that are adopted. All of which will impact on analysis and findings. None of this is "bad" of itself, but failing to recognise this circularity could be detrimental.

Furthermore, we found that the difficulties associated with defining SL can be associated with tensions within what might be described as the SL community. These issues of fluidic definition, ongoing negotiation, varying expectations, different practices, dissent, and emergent conventions together contribute to what we have described as the ambiguity of SL.

2.3 *Contested Definitions and "Community"*

Our attempted explorations of the pain barrier had raised the ambiguity of SL as an issue. This suggested the importance of exploring how residents were constituted in (and in relation to) SL. Our next phase of research was designed to focus on this process of community constitution and maintenance. Conflict over the definition or "real meaning" of SL are present in SL residents' discussions. We looked for an example of this that would allow us to investigate how users negotiated their community involvement, and what kinds of things counted as legitimate participation for them. Tensions relating to these issues were heightened during 2007 as a result of the proposed introduction of an integrated voice feature by the developers, Linden Labs. In discussions at SL forums during this period there was anxiety that fundamental aspects of SL would be altered as a result of the new feature.

We appreciate that forums have their own conventions and that SL forums should not be conflated with SL itself. However, what the forum offered was a ready-made display of contested definitions of SL and references to legitimacy and practices of exclusion, authored by SL users. We explored this in more detail while drawing on notions of communities of practice and legitimate participation drawn from Wenger (1998).

To do this, we identified a particular 21 page thread on a popular SL forum. The originating post in this case was from a self-described deaf SL resident expressing dismay at the imminent arrival of the integrated voice feature. In an iterative process, we analysed 13 posts on this thread to generate a set of identifiable rhetorical and discursive strategies. We then reviewed 100 posts to expand and clarify this set. We looked to the identification of objects and agents, claims about these, the classification of claims, counter-claims, and the construction of self, other and difference through these manoeuvres. This material was then organised according to its including or excluding function. By these means it was possible to map the work undertaken by forum participants as they performed particular identities, set up and attempted to enforce the terms of community and legitimacy, and defined SL itself.

Across the posts it was possible to identify inclusive rhetoric, where affiliation was claimed. Membership was performed, for instance, through declaration or reference to SL "belonging" – in assertions about how long a person has been a resident, through mutual recognition, or by displays of technical vocabulary and in implicit or explicit references to "us". Affiliation and inclusion was expressed in terms of affect (expressions of pleasure and contentment relating to SL use), and in relation to popularity and friends.

Similarly, it was possible to identify attempts to exclude, as when posters made declarations of apartness or distinction, for example, through reference to self "I'm not. . ." and through phrases such as "your kind" or "them"; in expressions of discomfort, or even in apparently supportive efforts which in actuality emphasised the distance between those identities constructed as normal, whole, or neutral, and those not ("I can't begin to imagine what it is like for people like you"). Posters would situate themselves "within" the SL community, positioning themselves and others in certain ways, while harnessing particular strategies. The original post became the ground from which claims and counter claims were made about what is realistic, fair or democratic; what is controversial, acceptable or admirable.

The introduction of the integrated voice feature stirred these debates because it threatened to undermine what were held to be definitive aspects of SL: its separateness from participants' "first" lives, and the option of anonymity. If voice became the default mode of communication in social settings, those not using voice (it was proposed) would be compelled to explain their choice. The use of voice was linked to issues of disclosure and trust, and such concerns linked to discussions about what SL is.

One definition in the thread that surprised us was the description of SL as a game. We had been certain that SL was not a game, because we share a background in game studies and we are accustomed to defining games according to criteria drawn from game studies literature (see, for example, Salen and Zimmerman, 2004). Games are played, and incorporate various modes of play. Games have goals, chance, rules, and discernable outcomes – which are absent in SL. So we were struck when posters to the forum referred to SL as a game or even a "videogame" (and these claims remained uncontested). For these posters, it was the separateness of SL from real life, the value of this separation, and the play in fantasy and identity that the

distinction affords, that meant that SL could be categorised in this way. As an aside we would note that this raises interesting questions about our reliance on structure-orientated definitions within game studies, and the "grey area" where games and play combine.

These issues emerged in the context of a discussion about the introduction of the integrated voice feature, because posters considered that voice was being introduced to service those sectors, such as business, that were being courted by the developers at the expense of "real residents". Across this thread, then, it was possible to identity tensions relating to identity and ambiguity, the defining of SL, and references to its "proper use" being aired by participants in the context of a discussion where legitimacy and inclusion were at stake.

During the project we looked at inclusive and exclusive patterns at the forum, rather than specifically at the issues referred to in the original post such as deafness and access. It was clear, however, that online communities and online worlds offer researchers a location to examine socio-cultural aspects of disability. At the conclusion of this project we returned to these concerns and conducted follow-on research into the impact of the voice feature on deaf residents (Carr, submitted 2009), and issues pertaining to voice, offline identity and "immersion" in SL (Carr and Oliver, in press).

Investigating tensions on the SL forums was useful in terms of our understanding of patterns of participation and community within this virtual world. The variability in modes of participation, however, can complicate attempts to document specific instances of learning (outside of educational settings). To investigate learning practices within virtual worlds, yet outside of educational contexts, we turned to the Massively Multiplayer Online Role-Playing Game, World of Warcraft.

2.4 Learning in Online Game-Worlds

World of Warcraft offers multiple modes of participation, yet play involves interacting consciously with particular structures and constraints. While the game incorporates variability and different modes of play, play styles and preferences, particular constraints or structures will – in part at least – define the experience and the "text". It has a generically definitive rule set, for example, that marks it as a role-playing game. This means that characters "level up" in experience points by performing particular tasks, and while specialising in certain traits (such as physical power or particular forms of magic, for example).

Play within World of Warcraft can be dramatic, variable, collaborative, social and expressive, but aspects of the game-play (rules, progression, goals, for example) are more defined than that which is on offer in general within SL. The game world has a geographic cohesion, with roads and transport hubs, major cities and public spaces as well as wild habitats and borderlands. Avatars or characters in the game do reflect player preference, in that customization involves the "look" of an avatar (its hair colouring, for example), as well as choice of species or profession, and the ongoing collection of particular equipment to further support specialist skills

(such as better healing powers, or greater resilience). While there is variation, the avatars conform to particular, customizable templates. The game is "owned" by its developers, but it only "lives" because of the input of its subscription-paying users. (For MMORPG analysis, see Taylor 2006, or Ducheneaut et al, 2006).

While learning obviously happens in this game world (otherwise players would not progress), studying learning practices is not straightforward. We did not want to divorce players from the physical world contexts of play, yet we wanted to focus on learning that emerges through players' participation with a game world and other players. Our solution was to focus on couples who play the game together, while sharing a real space.

We recruited through online guilds and real-world social networks, and interviewed ten people (four heterosexual couples and one mother-son pairing). In doing this, our previous experience in research and playing online games – we had been casual players of World of Warcraft for around 18 months when this project began, and we still play – proved extremely valuable in making initial connections to willing participants.

We interviewed our couples in game at a location of their choosing, and chat-logged the text-based semi-structured interviews, each of which lasted between 60 and 90 min. The resulting transcripts were split between the authors, and the contents categorised. These separate categories were then jointly reviewed and reconciled to produce our initial categories, which included references to:

- Who got who started and how
- Assessments of increasing competence (and incompetence)
- Help – from mentoring to "backseat driving"
- Guilds
- Affect
- Domestic space and assets ("best" chair or computer, for example)
- Alts (second or alternative characters)
- Gender
- Time constraints
- Relationships (in game, in guilds, being a couple, etc.)

After organising the data into these categories, they were reviewed to identify common elements. This led to the identification of "management of resources" as the central or organising concept, to which the others were all related. As we explained:

> Through an engagement with and analysis of this material we developed a framework through which to consider learning practices. This involved looking at increasing competence in relation to the management of resources, where 'management' involved the recognising, negotiating, accessing and applying of 'resources', which might be categorised as material, ludic or social. In actuality these three classes of resource constantly intermingle, yet these provisional distinctions allow us to gesture to specific examples of learning practice, and to the complexity of competence in this context. (Carr and Oliver, 2009)

In other words, as players' competence developed, they were able to identify and leverage an increasingly complex array of in-game resources, while negotiating real-world resources and demands. In fact we identified three inter-relating categories of resource: ludic, social and material.

Ludic resources involved the mechanics and economics of the game itself; learning how to play, how to "level up" and negotiate with the various options (forms of specialisation and strategy, for example). Social resources include peer assessment and mentoring, collaboration, player relations and networks (such as guilds) that can be drawn upon to support action. Actual or material resources, meanwhile, included the setting of play and the various factors (time, technology, game accounts and childcare) that may impact on play. Through this process, the interconnections between the real world contexts of play, and activities within a game-world were explored.

In a second phase of this research, our understanding of player competence in relation to these resources was developed further using concepts drawn from Wenger's work on Communities of Practice (1998). Specifically, players' accounts were explored in terms of trajectories of participation and multi-membership, looking for evidence that practices had been performed in a way that met the expectations of the communities which the players were part of (see Oliver and Carr, 2009). Typically, that would involve balancing the demands of the partner (e.g. to ensure housework is done, time spent together, and so on) against those of other players (e.g. to take up an important role in a guild event or raid), for example, in terms of how much time can be spent on each. Other examples included creating several characters, so that one could be played with a partner and another with other groups; or developing complementary areas of expertise, so that one partner could advise the other on useful User Interface "Mods" which would customise the game in a helpful way.

The general pattern reported in these players' accounts was of successful learning – understood as taking an increasingly responsible role in a community's practices, and requiring the acceptance of that community both of the person and their actions. However, there were exceptions. For example, one couple actively withdrew from a guild where other members had different priorities as regards spending time in the game; another participant had chosen to give up playing temporarily while their partner continued. This had involved ending some in-game relationships, and shifts in the time spent on other activities including house work. In both these cases, from a community of practice perspective, the participants were still learning as a result of the game. In the first example, what the couple learnt was about who or what they were *not* (e.g. that they were casual players not end-game raiders). In the second, the participants learnt about different priorities, and had to negotiate a way of balancing these that they both found to be acceptable.

While some of the ludic elements that featured in this study are clearly specific to online multiplayer games such as World of Warcraft, many of the social and actual resources involved would be the same for the use of any virtual world. SL users might manage different resource sets, or in different proportions, but we would nevertheless expect that learning practices in relation to the management of resources

could be documented in SL. For the sake of coherence it may be necessary to narrow the inquiry to identifiable communities of practice (see, for example, Burn, 2009). In such a case, the terms of legitimate participation might function as the implicit curriculum, for instance. To return to the example of World of Warcraft, it is interesting to consider this game as a combination of structures that support social and experiential learning and to ask – then – what games might teach us about curricula and pedagogic design. Questions of design are returned to in the discussion that follows, where learning and teaching are considered in relation to SL's amorphous tendencies.

2.5 Teaching in Second Life

In this section we give an account of our teaching in SL, with an emphasis on the issues of definition and ambiguity discussed thus far. This ambiguity should not be assumed to be a problem in a teaching context. On the contrary, as we have argued elsewhere (Carr, 2009), ambiguity has the potential to unsettle or de-naturalise aspects of our roles (as teacher, learner or researcher) – which could be considered one of the most interesting aspects of a virtual world for educators.

We taught four sessions in SL over two terms (see Table 2.1). These taught sessions were designed to fit into existing MA (postgraduate) programmes, rather than being designed to fully exploit or exhaustively test the various potentials of SL. We documented this work on a report posted to the project blog, "Learning to Teach in Second Life" (Carr, 2008). The following discussion incorporates material drawn from this report.

Table 2.1 The four classes in Second Life

Class no.	Course module	Class format
1	Computer games, gaming culture and education (from the MA in media, culture and communications)	Topic: Machinima Guest presenter and studio tour 4 students plus a guest, 2 facilitators, 1 guest presenter, 1 host (during tour)
2	Computer games, gaming culture and education (from the MA in media, culture and communications)	Topic: Fan practices and role-play Guest presenter 3 students plus 1 guest/informant, 2 facilitators, 1 guest presenter
3	Computer mediated communications (from the MA in ICT and education)	Topic: Virtual world research i. ethics 3 facilitators, approximately 15 students
4	Computer mediated communications (from the MA in ICT and education)	Topic: Virtual world research ii. discussion 3 facilitators, approximately 15 students

Methodologically, this phase of work echoed the reflective, experiential model of the first phase; however, we also drew on students' evaluations and general reflections about the SL sessions. These were posted by students to forums at Blackboard, the more conventional Virtual Learning Environment that was used for the course as a whole. Additionally, we chat-logged our sessions in SL (i.e. recorded the live text-chat that participants typed), and conducted post-session interviews with a course tutor, as well as follow-up interviews with students. The students were informed of our research at the start of their module, and the sessions in SL were elective. Students who did not wish to be involved with this research could opt out and instead follow the sessions as chat-logs that were posted to Blackboard.

The majority of participating students (especially the distance learners) found the SL sessions enjoyable and productive. The students compared SL to Blackboard, commenting that while Blackboard offered structure, it was socially "dry". SL, on the other hand, was highly motivating but occasionally anarchic or chaotic. The SL sessions offered very welcome real-time and virtual-space contact with peers and tutors. Most of the students, however, did not value SL over Blackboard. They appreciated the offers of both and described the identified differences as complementary. See, for example, this student's comments:

> So I thought the second [*Second Life*] session was great with the small groups. In comparison to Blackboard, there is that 'live' element – instant reactions in SL, compared to [...] Blackboard. Usually when making a posting on Blackboard, I do put a lot of thought into it – I often type them up in Word first, read them, correct mistakes [. . .] Blackboard gives me time to think. (Student interview, AM)

While most of the feedback was very positive, the students were not uncritical. The few students who had real-space access to peers and tutors were unimpressed by the SL sessions. Some of the students struggled with following text discussions, and it became clear that participating in discussions in SL with confidence is an acquired skill. While we had calculated on students having to familiarize themselves with the interface and the basics of avatar movement, we had not fully appreciated the problems associated with text-chat for beginners.

In terms of learning and content, the SL sessions worked because the topics (ethics in social world research, for example) were no longer abstract: the students were considering notions of privacy, consent, avatars, self-presentation and identity, while they were themselves inworld, as avatars. As this suggests, working and learning in SL can involve shifts in perspective (and in perceptions of research). Such shifts, while very productive, may prove disorientating for some students. Any such disorientation might be very productive if, for instance, it leads to discussions about the nature of research, or the relationship between a researcher and his or her object of study.

For tutors, SL sessions require significant amounts of preparation (emailing reminders, posting material to the VLE, writing and distributing notecards), and they are quite labour intensive to run. When possible we divided roles across two or three tutors. This left one tutor free to "direct" the session, greet stragglers or manage technical problems using instant messenger; one to lead the discussion

or present and, if possible, another tutor free to be immersed in the discussion itself, responding to the multiple input from the students with counterpoints or questions.

Both students and tutors found that the SL sessions to be quite intense and draining. While four students might constitute a very small group in a real classroom, it can feel like a sizable group in SL – and it is probable that the larger the group, the more necessary some kind of formalised structure becomes (especially in those situations where the participants are not experienced users of SL). As this suggests, classroom conventions do not translate in a predictable fashion. Over our four classes we moved from less structured, small groups, to more structured larger groups, and from a more exploratory format (tours and guests) to a more conventional format (group discussions held in-the-round, for example). These are not evaluative descriptions – we do not propose that one of these approaches is "better" than the other on the basis that it is more innovative, or less creative. What we find important, rather, is the manner in which a set of factors (see Table 2.2) combined during a session to engender particular affect.

To identify these factors, we reviewed students' comments and identified instances where affect (confusion, anxiety) could be linked to specific aspects of a session, and considered such elements across all four of the sessions. Session 1 and 2 were less formally and less familiarly structured than session 3 and 4. Additionally, the relationship between SL as phenomenon and the content of the meeting itself were less obvious in sessions 1 and 2 than they were in sessions 3 and 4. The various factors we found to contribute to greater and lesser degrees of ambiguity are summarised in Table 2.2.

Table 2.2 The factors in the sessions that contributed to or countered ambiguity

Classes 1 and 2	Classes 3 and 4
Elective activity	Core activity (but still voluntary)
Smaller group	Larger group
Guest presenters (with tutors present)	2 of the 3 tutors were known to the class
Course taught in mixed mode of delivery: via conventional VLE (first class), 2 days face-to-face residential teaching, 2 elective sessions in SL	All distance learning (on Blackboard) with 2 SL sessions
Mix of full time/on campus students, with part-time distance learner	All distance learners
Less straightforward relationship between course content (computer games, gaming and education), and SL as a whole, or as a phenomena	Obvious links between course content (computer mediated communications and education) and SL as phenomena
Some of the course literature (on simulations and role-playing for example) does apply to SL	Clear relevance of much of the course literature and set reading
Session format: Tours, guest presenters, projected images, various locations	Familiar discussion and presentation format, in one location
(greater ambiguity)←←	→→(reduced ambiguity)

Depending on the degree to which a session is structured, and depending on the management of elements such as those mentioned in the above table (and this is not an exhaustive list) we would propose that ambiguity (of place or role, for instance) might be either amplified or suppressed according to the teacher's needs. A degree of disorientation or ambiguity might be productive in one learning context yet completely counter-productive in another. When planning teaching in virtual worlds, then, pedagogic structures could be imagined as constituting an aperture through which ambiguity can be incorporated and managed. "Managed confusion" can be pedagogically useful if, for instance, it confounds expectations, exposes assumptions and promotes reflection. One difficulty, however, is that effectively managing these affective aspects of learning can be a problem in a virtual world where the teacher might have surprisingly little access to real-time feedback.

The fact that so many things are possible in SL means that every decision is open to question. Why take the appearance of a humanoid? Why "sit" in a chair? Why reproduce a lecture theatre? The unfamiliar format rendered pedagogic design "visible" to our students. This is potentially significant in relation to education studies. The students questioned the various pedagogic decisions that had been made, wondered about the role of student (or "good" student), and the expectations of their tutors:

> The 'real class' occurred when we were asked to sit around [the tutors...But what] was the tutor's perception towards the students' participation? Did they give credit to students who answered most of the questions [?...What if] *Second Life* crashed and it took a long time sometimes to restart? The tutor might think that this student participates less (Ae's report)

We propose that it would be productive to further explore the uses and management of ambiguity in virtual world learning contexts. Furthermore, we wonder if it would be illuminating to consider these issues while drawing on theories of game design. SL is not a game *per se*, but nonetheless it is arguable that game design theory (see Salen and Zimmerman 2004, for example) could usefully inform and help to develop our thinking on virtual world pedagogy. The relevance is not due merely to interactivity or "immersion". What is significant, we suggest, is that successful, engrossing games blend the conditional with the experiential. "Conditionality", in this instance, involves rules, etiquette, software or curriculum, whereas the "experiential" involves play, agency, learning, improvisation and collaboration. Game designers have to think about real-time experience, location, context and constant feedback. Games such as World of Warcraft involve the clear communication of goals, yet also allow scope for the player to exercise prerogatives and preferences, experiment, and make mistakes. Such games require effort and persistence. Learning during play involves (as we have argued) the discovery and application of various resources. Successful games mix specific yet potentially adaptive structures (such as rules), with the timely delivery of information. All of which is relevant to teaching in virtual worlds.

Finally we would note that the SL sessions contributed to the social aspects of the distance course, supporting student confidence and engagement (and thus possibly retention) in the process. One student commented, for example, that the sessions

were "interesting in that I felt as though I was actually meeting the rest of the class for the very first time" (from Af's report), while another remarked that

> I could feel the 'real class' when I saw bunch of you gathering at the outside of the ground floor. I felt that finally I would meet all my classmates (even though it was not real). Can you imagine in real life when you meet your classmates for the first time and you will automatically introduce and ask around about people? It was fun (Ae's report)

Thus the impact of the SL sessions went beyond the learning that took place in terms of content delivery, to alter social dynamics and participation in the course more generally. By supporting informal, social peer-to-peer contact, these sessions enhanced the students' experience of the course as a whole. SL's ability to support peer-to-peer informal contact between distance learners should not be underestimated.

2.6 Conclusion

The pedagogy that is emerging from this work may best be understood in terms of managing the ambiguity that virtual worlds bring, rather than necessarily removing it. As the research described in this paper makes clear, the object of study (a virtual world) is constructed and enacted in different ways according to the setting in which it is encountered, and the interests of the user. This cannot be avoided. It can, however, be worked with pedagogically. For instance, this variability or ambiguity renders roles, teaching designs and practices unfamiliar or visible, and thus it may be used to draw attention to issues of pedagogic importance.

This was most evident when the educational process itself was the focus for teaching. In such a case, the various design decisions and the perceived potentials of virtual worlds were questioned and challenged by participants, thus heightening their awareness of the issues involved in "education and computer mediated communications" debates, for example. However the same complexities and ambiguity can be seen in relation to other topics, and in other contexts. The forum responses to the issue of deafness provide a case in point. In the discussions that we reviewed, deafness was constructed as a disability, and a tangled relationship between actual hearing loss, online identity (both "normal" and "other"), technology, social inclusion and virtual community was evident. Contested definitions, assertions regarding more or less legitimate participation, and the carrying over of real-world expectations and identities into online identities all contribute to the ambiguity of SL.

While there is much here that might be regarded as critical, we would repeat that the overall response from students was very positive, to the extent that SL sessions in one form or another will be integrated into at least two of the Institute of Education's MA programmes during the coming academic year. This presents us with an opportunity and we hope to extend this action research into a next iteration, continuing in our role as educators while further refining and extending our research into virtual worlds, learning, ambiguity and affect.

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Chapter 3
The Second Life Researcher Toolkit – An Exploration of Inworld Tools, Methods and Approaches for Researching Educational Projects in Second Life

Elena Moschini

Abstract Academics are beginning to explore the educational potential of Second Life™ (SL) by setting up inworld educational activities and projects. Given the relative novelty of the use of virtual world environments in higher education many such projects are still at pilot stage. However the initial pilot and experimentation stage will have to be followed by a rigorous evaluation process as for more traditional teaching projects. The chapter addresses issues about SL research tools and research methods. It introduces a "researcher toolkit" that includes: the various stages in the evaluation of SL educational projects and the theoretical framework that can inform such projects; an outline of the inworld tools that can be utilised or customised for academic research purposes; a review of methods for collecting feedback from participants and of the main ethical issues involved in researching virtual world environments; a discussion on the technical skills required to operate a research project in SL. The chapter also offers an indication of the inworld opportunities for the dissemination of SL research findings.

3.1 Introduction: Researching Education in Virtual Worlds

Virtual environments are becoming the new frontier of online education. A number of educational institutions are experimenting with innovative teaching and learning approaches using immersive online worlds such as Second Life™ (SL). Teen Second Life™ (TSL) the special area dedicated to users aged 13–17, hosts a number of educational projects. In SL educational activities range from technical training on how to build your avatar, organized by inworld educational groups, to the more formal teaching sessions associated with established schools and universities. Teachers and researchers are attracted to SL by its immense potential to support new forms of communication, to enable simulations and experiments, to allow users to construct

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new identities and new environments, to explore the development of inclusive educational pedagogies (Chapter 1 by Sheehy this volume), and to support distance learning (Livingstone and Kemp 2006; Kemp and Haycock 2008; Ritzema and Harris 2008). John Kirriemuir has been documenting these developments in his "snapshot" reports for the Eduserv Foundation (Kirriemuir 2007, 2008a, 2008b). These highlight an increased level of educational activities, many of which are still at initial or pilot stage. As these activities become more advanced and more embedded in mainstream practice they will require more attentive evaluation. This chapter outlines the main issues involved in researching learning in SL and aims to support those educators who are now exploring the evaluation and research stage of their teaching practice in SL by providing an overview of the main issues involved in researching learning in a virtual world.

3.2 Designing Second Life Educational Research Projects

The process of designing research projects in SL follows the same cycle as that of any other academic research project: the researcher sets aims and objectives, identifies the relevant theoretical background, selects appropriate methods, gathers and analyses data and disseminates results (Cohen et al. 2007). However, operating in a virtual environment presents a number of new obstacles, as well as new opportunities. Some of the research tools available in SL mimic their physical world equivalent while others are totally new and require a certain degree of familiarity with SL tools and technologies. Organising a venue for the research project can also be a new challenge, while disseminating findings to the inworld community presupposes knowledge on SL media channels and of community and group dynamics. The design of SL educational research projects should consider the following issues:

- Type of project: is this a blended learning project or an exclusively inworld or distance learning project? Is this a comparative project where similar educational activities are conducted in the physical world as well as in SL?
- Define the learning activity to investigate: practical skill acquisition, collaboration/group work, communication/presentations, simulation, etc.
- Formulate research questions, identify the appropriate theoretical background.
- Venue: is the project going to take place in a plot owned/rented or managed by the researchers? Or is the project set in an open environment within SL?
- Participants: age, gender, background. Do the participants know each other or would participants be able to get to know each other in the physical world or is the project conducted exclusively inworld?
- Research methods: is the project being evaluated exclusively via SL tools or is the chosen methodology a blend of online and traditional tools?
- Ethical issues: is the project infringing the Community Standards or the ethical guidelines for online research?

- Data Analysis: what tools will be used for data analysis? Are there new tools that can assist in analysing data gathered in a 3D virtual environment?
- Dissemination: what are the best channels for the dissemination of the results, both in SL and to the wider academic community?

3.3 Defining the Type of Activity to Investigate and the Aims of the Research Project

SL educational activities can take several forms:

- Practical skill acquisition (Cargill-Kipar 2009)
- Collaboration, group work and distance learning (Edirisingha et al. 2009)
- Community building (Peacher, Chapter 6, Carr, Oliver and Burn, Chapter 3, this volume)
- Discovery, inquiry, and discussion; simulation and problem-solving (Toro-Troconis et al. 2008)
- Motivation (Edwards et al. 2008)
- Creation of interactive learning environments and link to Virtual learning Environments (Doherty and Rothfarb 2006; Livingstone et al. 2009).

Educators often tend to start experimenting with SL by setting up discussion groups and opportunities for enhanced communication. Projects might then evolve into more complex scenarios, involving more interaction with the virtual world environment and more advanced use of the inworld tools (Ryan 2008). Simulation, games and role-playing attempt to fully exploit the opportunities offered by an interactive virtual environment. SL educational projects range from supplementary support for traditional face-to-face teaching to fully-fledged distance learning courses, conducted exclusively inworld. The distinction between the use of immersive environments in a distance learning scenario or as part of a blended-learning strategy has an impact on the aims of the research and on the choice of research methodologies. In a blended learning setting, where other methods, technologies and approaches are also utilised, research might be focused on the value of the inworld experience in relation to the other methods employed. In an exclusively distance learning setting the emphasis might be placed on the support and enhancement of communication and social interaction for an otherwise dispersed learning community.

One of the primary considerations in researching learning in virtual worlds is related to the nature of the inquiry. Is the project designed to investigate a hypothesis or a theory? Is it based on the desire to improve the learning activities and teaching practice (Addison and O'Hare 2008)? Is it the evaluation of a specific project to satisfy requirements from the funding bodies or to seek further funding or institutional support? Is it aiming to investigate the learners' experience or the educators' perspectives? Is it about further understanding the technology and its potential applications for educational purposes (Hollins and Robbins 2008;

Twining and Footring, this volume, Chapter 4)? Is it aiming to explore online pedagogy in an action research framework (Carr et al. 2008)? Is it about comparing inworld and physical world situations or exploring the boundaries of virtual and physical environments (Thackray et al. 2008)? The definition of the research aims inevitably shapes the research questions but also the methodologies to be employed and the theoretical frameworks informing the research.

3.4 Learning Theories and Education in Virtual Worlds

Learning theories provide a reflective foundation for educators for the planning and developing of their teaching but also tools for interpreting their work with learners (Hoadley 2007). Some of these theoretical perspectives on learning are particularly relevant for the educational applications of virtual worlds.

3.4.1 Approaches to Education Theory: Behaviourism, Cognitivism and Constructivism

Theories of learning have evolved from early developments in pedagogy to more contemporary frameworks which attempt to interpret rapid transformations in education that may be linked to new policies, technologies and social change more generally. Virtual worlds offer a channel for the implementation and evaluation of some important theoretical approaches. Constructivism seems to fit very predominately in this scenario. Constructivism departs from the Behaviourist approach to learning, which mainly focused on stimulating behavioural changes by conditioning and reinforcement, as well as from the Cognitivist approach, focusing of the mental processes of learners. Constructivism is a perspective that emphasizes the role of learners in constructing their own knowledge through interactions with others and their environment. Students are envisaged as active participants in their education; teachers are therefore facilitators and mentors rather than instructors. Constructivism has been largely shaped by the work of Russian psychologist Lev Vygotsky who was interested in exploring how social interactions and the social settings influence the learning experience; his work has provided the foundations for several subsequent theories of learning. Virtual worlds are constructed, designed and shaped by their users. Communication and social interaction are at the centre of the virtual world social experience. Virtual worlds therefore present an ideal platform for the engagement of learners in constructivist-focused educational practice.

3.4.2 Situated Learning and Communities of Practice

The fundamental role played by the concept of learning community is an important factor in analysing education in virtual worlds. The work of Vygotsky (1978)

introduced the concept of zone of proximal development where students are engaged in problem-solving under the guidance of a more expert peer. The idea of increasing the student competence level by associating them with a more knowledgeable partner or a community is at the core of the notion of Communities of Practice. Jean Lave and Etienne Wenger also highlighted the role of apprenticeship in their book *Situated learning: Legitimate peripheral participation* (1991). Legitimate peripheral participation involves learners as participants of communities of practitioners where newcomers have the opportunity to learn from the masters and therefore develop their knowledge and skills in order to move from the periphery towards the centre of the community. Wenger (1998, 2002) has further developed the concept of Communities of Practice defined as "... groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al. 2002, p. 4). Virtual worlds are the natural home of online communities; they support socialisation and exchange between participants in a much more effective way than other, less immersive, online tools. Mutual support and assistance to the novice are important aspects of SL. So-called "newbies" are officially introduced to the world in specially designated spaces, such as *Orientation Island,* but are also often offered tutorials and assistance by the more experienced avatars. "In a 3D learning environment, the new and the inexperienced typically are mentored by more experienced learners and both gain from the social interaction between the two" (Jones and Bronack 2007, p.96).

3.4.3 Experiential Learning

Another useful theoretical framework is offered by Experiential Learning, a theory of learning by reflective doing proposed by educationalist David A. Kolb (1984). Kolb was influenced by the work of John Dewey, Kurt Lewin and Jean Piaget in developing his theory that places the emphasis on the learners' critical reflection on their own experiences. According to Kolb, "Learning is the process whereby knowledge is created through the transformation of experience" (Kolb 1984, p. 38). Kolb's Learning Cycle model envisages learners engaged in four recurring stages: concrete experience; observation and reflection; formation of abstract concepts and testing implications of concepts in new situations. Kolb also developed the Learning Style Inventory, outlining four major styles of learning: convergent; divergent; assimilation and accommodative (Kolb 1984, p. 77). Both the Learning Cycle model and the Learning Style Inventory have been subsequently further developed and revisited by other educationalists, including Peter Jarvis (1987). An experiential-based learning activity in a virtual environment would focus on the experience of the avatars/learners in a three-dimensional world. Virtual worlds such as SL offer an excellent stage for the setting-up of learning experiences that enable students to practice, test and re-enact situations, dilemmas and challenges related to their studies. Learners also have unique opportunities to observe themselves and others in action, from a first-person view as well as from a third-person view, and to

exchange reflections with the other participants and with the teachers via the several communication tools available. The knowledge and skills obtained through these virtual experiences can then be translated to physical world situations and to new scenarios.

3.4.4 Problem-Based Learning

Problem-Based Learning (PBL) is centred on the learners' ability to analyse a situation or a problem and construct a method of assessing available resources that will address and solve the problem. PBL activities involve setting up an issue to investigate, outlining the available learning resources and allowing the students to work out a solution by direct inquiry and collaboration among themselves. Virtual worlds can provide excellent settings for PBL as they offer tools for the creation of simulated problems for a number of different disciplines. Students can then be directed toward inworld resources on the topic, in the form of notecards, web links and scripted objects, as well as to the more traditional online and offline resources to enable them to work at the solution of the set problem (Brown et al. 2008; Good et al. 2008).

3.4.5 Digital Game-Based Learning

Digital game-based learning is concerned with the use of interactive games for educational purposes (McFarlane 2007). Marc Prensky is one of the best known advocates of the use of games in learning; he envisages "...the coming together of two seemingly diametrically opposed worlds: *serious learning* in schools and businesses, and *interactive entertainment* ..." (Prensky 2001, p. 15). Prensky is eager to stress the importance of motivation and fun in the learning process, especially when addressing topics that are perceived as difficult or even boring. He proposes the concept of "digital natives" to define the young generation of learners who are comfortable and competent in using digital media technologies. According to Prensky games are familiar platforms for this generation and their potential should be fully exploited. James Paul Gee also supports the use of games to develop a new set of digital literacies (Gee 2003). The debate whether persistent online environments can be considered games or whether we should focus on their overall features as synthetic worlds (Castronova 2005) is still open. However virtual worlds such as SL can be used as a platform for open-ended playful activities where it is also possible to build a gaming environment designed for educational purposes. Virtual worlds as well as online games can offer opportunities for the development of gaming and simulation learning activities: "There is a big lesson from MMOG (Massively Multiplayer Online Games) environments. People are enormously capable when given the space and motivation, even through simple gameplay, to flex their cognitive and social muscle in an environment where anything is possible and experimentation is safe, permissible, and desirable (Galarneau and Zibit 2007, p. 81).

3.5 Ethical Issues

The main issues concerning ethical standards in virtual communities focus on consent, online identities, the nature of communication (private or public), privacy and confidentiality and the community own rules and standards (Eysenbach and Till 2001). Ethical concerns vary according to the nature of each research project (Ess 2002; Eynon et al. 2008) but a major ethical dilemma relates to the standards to be used when working with "human subjects". As the virtual inhabitants of SL can appear to be animals, fantasy creatures, plants or even objects, the traditional safeguards might seem obsolete. However behind each avatar there is a human user and the usual research ethics considerations still apply.

3.5.1 Terms of Service and Second Life Ethical Guidelines

There are diverse types of guidelines that can be usefully applied to research activities in SL. Terms of Service agreements (also known as TOS) are the fundamental source of information about what type of behaviour is acceptable in this virtual community. The SL set of documents available at time of writing (http://secondlife.com/policy) that address policy and regulation issues includes: Privacy, Community Standards, TOS, copyright, SL brand management, online safety and tax issues. TOS (http://secondlife.com/corporate/tos.php) have to be agreed to before users can start their SL experience, however very few users actually take time to read the document properly. Researchers operating within SL should familiarise themselves with the above documentation and especially with the Community Standards document that explicitly addresses the thorny issue of the recording of conversations: "...Remotely monitoring conversations, posting conversation logs, or sharing conversation logs without consent are all prohibited in Second Life and on the Second Life Forums" (Linden Lab, Community Standards). Therefore before selecting the record option in the chat communication preferences the researcher should obtain informed consent from the participants.

3.5.2 Obtaining Consent

Obtaining consent can be a difficult matter when operating in a public place with unknown or anonymous avatars; and it is particularly difficult to monitor participation when avatars can frequently change their appearances and hide their names. Requiring an avatar to disclose personal information in order to send/receive consent forms can infringe that avatar/user privacy. Some researchers choose not to require respondents to provide their real names and do not attempt to verify the respondents' real identities (Boellstorff 2008). However when such verification is desirable or required a simple option can be the setting up of dedicated spaces and communities where the research project can be conducted in a controlled environment, with known and consenting participants. In this case consent can be gained

via traditional methods and the identity of the avatars/participants can be verified. Some of the most innovative SL tools, such as chat boxes, visitor source trackers, surveillance tools, visitor monitoring and recording, while providing a wealth of interesting data and allow improved user identification, can create very serious ethical problems in terms of privacy and consent. Researchers who choose to use such tools on their land should always inform visitors. When the research project is set in more open environments it might be possible to notify the community in question about the ongoing data gathering and obtain consent from avatars via notecard giver tools. However accepting consent from unknown avatars via inworld tools might not entirely satisfy institutional guidelines on ethics. Consent issues in online research has been widely discussed in the literature, especially in relation to online courses, while new forms of online communication such as SL seem to bring new challenges that do not find an immediate solution: "Ethical issues related to e-learning research occur when obtaining electronic consent and ensuring its authenticity. Although these issues are not entirely unique to e-learning research, they do tend to become more complex and hence more problematic when research is conducted over the Net"(Kanuka and Anderson 2007, p. 8).

3.5.3 Identity and Privacy

Other important aspects of research ethics concern the identity of the researcher and of the participants and the privacy of the avatars that might be unwillingly involved in the research project. Virtual worlds allow for greater levels of anonymity, users can assume all sorts of different appearances, open more than one account and create so-called alternative avatars and choose not to disclose their physical world identity. There might be situations where inworld interviews are conducted with different avatars that in fact are attributable to the same person or there might be more than one user behind the one avatar. It is therefore important to make decisions whether there is a need to require participants to disclose their physical world identity and whether alternative avatars would affect validity and reliability. Researchers could adopt similar mimetic strategies and therefore mislead research participants. The best way to avoid this is to clearly indicate one's researcher status. Educators and researcher often disclose enough information about their avatars' "First Life" (by completing an associated page of information about themselves that can be viewed by anyone seeking information about their avatar) to allow verification of their physical world status.

3.6 The Virtual Participants

3.6.1 Avatar Psychology

Graphical virtual environments existed before the advent of SL. Neal Stephenson's novel *Snow Crash* (1992) introduced the *metaverse,* an immersive virtual-reality

world where users could adopt a new identity. *Snow Crash* fired the imagination of technologists who tried to implement Stephenson's vision producing a number of virtual communities. SL is one of the best-known of these worlds, having reached wider audiences and mainstream media attention. Virtual worlds are populated by avatars, virtual representations of the users. The relationship between avatars and their creators has been extensively discussed in terms of identity construction, representation, engagement and even addiction. Avatar psychology provides useful insight in the way learners and teachers construct and manage their identity in virtual worlds and how avatar behaviour might influence the outcomes of educational projects (Schroeder 2002; Schroeder and Axelsson 2006).

3.6.2 Building Your Avatar

SL users have a choice of tools to customise their avatar appearance. The first step is choosing a name, then a type of avatar; human or animal, male or female, etc. These initial choices occur during the registration process but can be revised at any time. Avatars are given a standard, entry-level set of clothes but are encouraged to customise their looks and clothing during the orientation process. Newbies spend a considerable amount of time fiddling with the tools that allow them to change their body, while more experienced users may invest their Linden Dollars in acquiring trendy new skins, hair and clothing. By carefully building their avatar, users project an image of themselves that defines their social status and their online-personality (Meadows 2008). John Suler (2007) has discussed the main issues in the psychology of avatars in The Palace; he has identified a typology of avatars that can also be found in other virtual worlds: Animal Avatars, Celebrity Avatars, Evil Avatars, Real Face Avatars, Idiosyncratic Avatars, Positional Avatars, Power Avatars and Seductive Avatars. Users wanting to adopt more than one typology can save different avatar profiles in their inventory or create additional, alternative avatars, with different names and identities. Avatar building is now an essential skill for the savvy user of online communities as most social networks require or encourage users to create a visual representation of themselves. Therefore users can have a variety of avatars appearing in various communities, adapting their identity to their communication needs. Vasalou and Joinson (2009) have studied avatar creation by the same users in three different settings: blogging, dating or gaming. They found that users carefully constructed their avatars depending on the domain they intend to visit. Behavioural changes linked to avatars' appearances have been also observed by Yee, Bailenson and Ducheneaut (Yee et al. 2009); their studies highlight how virtual bodies can affect interaction both in online communities as well as in subsequent face-to-face communication.

3.6.3 Being an Avatar/Learner or an Avatar/Researcher

When starting a SL educational project some students, as well as teachers, might be new to virtual worlds and therefore being in the position of having to open

accounts and create an avatar for the first time. Beginners can benefit from the excellent overview provided by the *Second Life Quickstart Guide* published on the SL website: (http://static-secondlife-com.s3.amazonaws.com/downloads/Second_Life_Quickstart.pdf). New residents can also consult one of the SL guides published in recent years, such as *Second life: the Official Guide* (Rymaszewski 2008) or *The Unofficial Tourists' Guide to Second Life* (Carr and Pond 2007). On the other hand some students already have an avatar that they use for recreational and socialization purposes. Often users feel the need to create a new avatar to be used for education, distinct from the avatar they use in other contexts. This allows SL residents to construct different identities and maintain the privacy of their alternative (or "alt") avatars. An academic avatar might display real contact details in the "First Life" section of the avatar profile (see Fig. 3.1 below), so that they can be identified and contacted off-world. This becomes particularly useful for researchers in other to fulfill ethical requirements and for students in order to identify their classmates. Appearances, clothing and gestures can also be calibrated to suit a learning environment. This does not mean that learners and teachers will necessarily be very formal in their appearances; it is not unusual to have groups of learners displaying a variety of avatar shapes, from animals to fantasy characters. The decision to

Fig. 3.1 Publishing personal contact details in the avatar profile. This can be done by right-clicking on the avatar and selecting "Profile" and then selecting the tab "First Life"

establish an anonymous community, where the participants do not know their real identity, as opposed to one where SL names are matched to physical world names poses fundamental questions of methodology and research outcomes and shapes the nature of the teaching and learning activities. Anonymity might enhance participation in conversations and group work and support those students that might struggle with physical world participation because of lack of confidence, language difficulties or other factors. Anonymity can also generate a more egalitarian and democratic learning experience as students and teachers are not clearly identifiable. Finally, anonymity ensures confidentiality and safeguards privacy during the evaluation process. On the other hand, knowing the real identity of the participants allows integration with off-world learning activities, with formative and summative assessment opportunities and with Virtual Learning Environments.

3.7 Research Methods

Selecting an appropriate methodology for the investigation of learning in SL requires attentive reflection on the scope of the research project but also on the available online and offline tools as well as on the potential ethical issues posed by the chosen methods. The traditional discourse about the quantitative, qualitative, and mix-methods approaches still applies (Cohen et al. 2007). However virtual worlds also present choices in terms of offline and online methods (Fielding et al. 2008), questions about researching online environments (Hine 2005; Markham and Baym 2008) and about physical world and virtual world methods.

3.7.1 Physical World and Virtual World Methods

Residents in virtual worlds generate their own communities, culture, economies and normative behaviours. They inhabit virtual environments and construct their virtual identities often without any reference to their physical world situations. Is it therefore sometimes desirable and appropriate to conduct exclusively inworld research, without employing methods that would relate the participants' SL with their physical world? Tom Boellstorff has explored this issue when conducting an ethnographic study of SL: "...studying virtual worlds 'in their own terms' is not only feasible but crucial to developing research methods that keep up with the realities of technological change" (Boellstorff 2008, p. 4). On the other hand there might be situations and projects that require a mix-method/mix-worlds approach "Research on online communities that includes meeting residents in the actual world is perfectly legitimate, but addresses a different set of questions". (Boellstorff 2008, p. 61). Virtual worlds offer an increasing choice of tools to conduct inworld research but also to link from inworld objects to other online tools such as web-based questionnaires, blogs etc.

3.7.2 Virtual Ethnography in SL

Ethnographic studies of virtual worlds can capture the rich tapestry of relationships and cultural exchanges that shape the social and learning activities of residents. Ethnographic methods include participant observations, journals, descriptions and interviews. Tom Boellstorff has explored the culture of SL in his book *Coming of age in Second Life: an Anthropologist Explores the Virtually Human* (2008), while Wagner James Au documented the early years of SL in *The Making of Second Life: Notes from the New World* (2008). The discourse on the emerging field of virtual ethnography has involved the study of text-based communities, blogs and wikis, Massively Multiplayer Online Games and immersive virtual worlds. These studies have highlighted the need for new methodological approaches. Natalia Rybas and Radhika Gajjala propose a Cyberethnographic Research Method to study virtual identities and virtual environments: "We argue that the ethnographic praxis in technology-mediated environments includes both production and consumption of technological artifacts. . .a researcher becomes a user and enters the environment she studies in order to live, to work, and to do things in and with these spaces" (Rybas and Gajjala 2007). Julia Gillen (Chapter 5 of this volume) has outlined a "virtual literacy ethnography" to explore new literacy practice in SL. The SL virtual ethnographer has to embrace the virtual world life and culture and master the inworld tools and technologies as well as its conventions.

3.7.3 SL Research Tools

As previously discussed the choice of research methodologies and tools for the evaluation of SL educational projects is quite broad. Researchers can choose to conduct the project in SL but then evaluate the results in the physical world by using traditional research methods involving the research participants; another option is to use web-based tools; avatars can be prompted with messages directing them to a web page hosting an evaluation kit, for example an online questionnaire, blogs, rating systems etc. There are, however, tools and techniques that allow for inworld data gathering and that are beginning to shape a new, inworld set of methods.

3.7.3.1 Second Life Questionnaires

Inworld questionnaire tools can be scripted or bought from vendors that specialize in marketing tools. SL vendors can be found via the inworld searching tools, however most of the professional vendors also advertise via the Xstreet SL Marketplace (https://www.xstreetsl.com). The questionnaire kiosks often operate by presenting the participants with notecards with the questions and a choice of options, open questions can be responded to by using the chat tool (see Fig. 3.2 below). The responses are then automatically e-mailed to the researcher for data analysis. These kiosks can also offer a gift box or Linden Dollar monetary rewards for the completion of the questionnaires.

Fig. 3.2 An example of a questionnaire kiosks

An alternative, simpler, option is to distribute notecards with questions and ask the participants to respond to the questions by editing the notes and then returning them to the researcher (see Fig. 3.3 below).

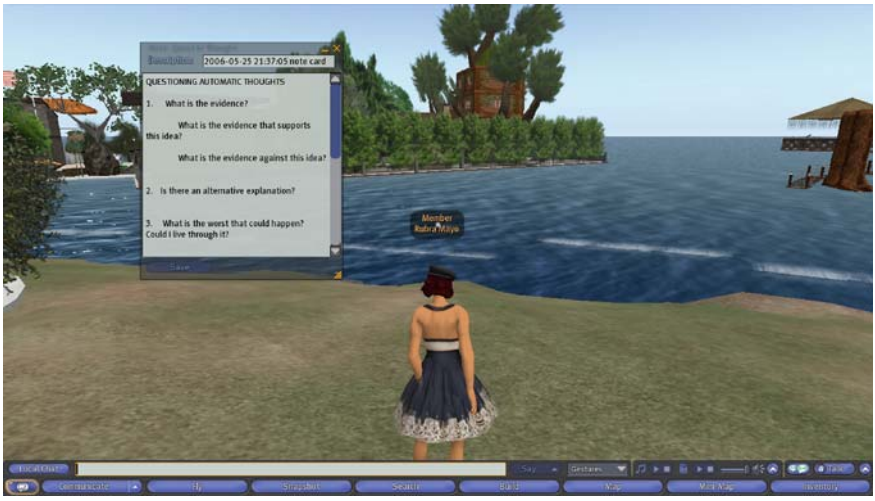

Fig. 3.3 A notecard-based questionnaire

3.7.3.2 Recording Interviews and Focus Groups

Interviews and focus groups can be also be organized directly in SL and then recorded, with the respondents' informed consent, for later data analysis. Recording

conversations can be enabled by checking the "log chat" box found in the "Communication" section in the Preferences panel; the file can be saved on the researcher's hard disk, it will appear as a written log of the typed conversations. Researchers will therefore have a ready-made transcript of chat-based individual or group interviews. Chat conversations can be quite difficult to decode as the stream of text input is not always sequential and it might include all sorts of other information exchanged between participants. A more direct way to interact with interviewees is that to enable private conversations via inworld Instant Messaging. This would filter out other sources.

For good quality video and audio recording it is best to use third party software. *FRAPS* is one of the most popular Windows-based video capture utility for SL and games (it can be downloaded from http://www.fraps.com/). While Mac users might consider built-in Mac screen-capture facilities or tools such as *Capture Me* (http://www.chimoosoft.com/products/captureme/). Captured footage can then be viewed with common media players or edited and decoded with video editing packages such as *Adobe Premiere*, *Windows Movie Maker* or *Apple iMovie*. Screen-capture software usually records scenes from the avatar's perspective, however sometimes it is important to be able to record from different viewpoints to get a fuller picture of the action. This is particularly relevant in the case of focus groups, action research and ethnographic studies. Acquiring a SL camera kit allows the researcher to produce more accurate video documentation, for example Alt-Zoom Studios provide a freely available scripted camera object (http://alt-zoom.com/).

3.7.3.3 Visitor Tracking and Monitoring, Source Tracking Systems

Quantitative data on avatars' origin, behaviour and frequency of visits can be obtained via tracking systems available from inworld vendors. These tracking devices can produce a list of visitors, discover where visitors are coming from, install spying devices that can follow the avatars and report their conversations wherever they are, trigger surveillance devices that record visitors' movements even when the researcher is not present on site. Collecting user behaviour patterns has become an essential aspect of SL business, tools such as Maya Realities (http://www.mayarealities.com/) offer passive visitor information collection, feedback surveys and an API to measure interaction with existing virtual objects. It is, however, important to ensure that the use of such tracking devices in research projects do not infringe Linden Lab Community Standards and especially research ethics guidelines. On the other hand some useful tools, also available from SL vendors, can protect avatars from unwanted privacy intrusions and quickly enable defence strategies. One such popular tool is MystiTool, a multi-purpose device with several features including avatar scanner, bug radar and remote Sim-wide scanner. MystiTool also allows to ban, unban, unsit, and eject unwanted avatars from the owners' land.

3.8 Practical Aspects of Researching Education in SL

3.8.1 Setting the Scene, Land and Venue Issues

The SL location where the educational activities take place has a great impact on the experiences produced. Identifying and acquiring access to the right type of venue is a key element in setting up an educational research project. Some educational activities are carried out in public areas and do not require dedicated spaces. For example students learning about cultural issues can visit one of the many existing museums and galleries or join groups dedicated to the discussion of specific themes. Students researching health issues can visit simulation islands where they can explore and experience the symptoms, treatment and type of care packages available for certain types of diseases. However many teachers and researchers prefer to identify or to set up dedicated spaces for their student groups; this allows them to control and shape the learning environments to suit their needs.

When looking for an appropriate venue there are several available options:

- Buy or rent land privately
- Buy or rent with institutional support
- Buy educational islands
- Rent from established educational islands
- Join a community and use their land facilities

The choice is likely to be dictated by the available budget, long or short term commitments to the project and levels of institutional support.

3.8.1.1 Land Ownership

Land ownership is a rather complex issue as land varieties, land prices and management fees vary in time. For up-to-date details and fees about land ownership it is advisable to consult the information published by Linden Lab at: http://secondlife.com/land. The following is a snapshot of the main issues related to land ownership at the time of writing:

3.8.1.2 Land Varieties

There are three varieties of SL land:

- Mainland
- Islands (Private Regions)
- Openspaces

The SL Knowledge Base resource *Private Region Types* provides an overview of the characteristics of each type of land with the associated costs: https://support.secondlife.com/ics/support/KBAnswer.asp?questionID=5721.

3.8.1.3 Premium and Basic Accounts

A Basic account is free of charge and allows users to freely navigate the SL environment, communicate with other residents and enjoy a number of activities. However land ownership involves upgrading to a Premium account: "To purchase land in SL, you must have a Premium account, current payment information on file, and your account must be in good standing (i.e. not delinquent). You may also be required to have a clean disciplinary record" (Linden Lab, Knowledge base). A Premium account requires paying a monthly fee. Use Fee or Tier Fee is a monthly charge in addition to Premium membership. Land use fees are billed based on the amount of land owned.

3.8.1.4 Educational Islands

Discounts are available for non-profit institutions that purchase educational islands. Acquiring an educational island requires verification of status as an educator or non-profit. All TSL island orders require parental/guardian approval if under 18 and a background check if 18 or over.

3.8.1.5 Renting from Established Educational Islands

Plots and venues can be rented from established educational islands such as Education UK Island (http://www.sleducationuk.net) or the International Society for Technology in Education – ISTE (http://www.iste.org/secondlife).

3.8.2 Expertise Required? The SL Researcher Learning Curve

Educators who start researching learning in SL must acquire a number of new skills and especially: how to build and customise an avatar, how to use inworld communication tools; how to acquire objects; how to use, modify and build tools; how to manage SL currency tools and the SL etiquette. The novice SL user can find useful tutorials via the online SL Knowledge base and support tools (http://secondlife.com/support/) and the SL Wiki (http://wiki.secondlife.com/wiki). As previously outlined, many tools and objects can be bought by SL vendors, however the ability to build and customise tools can greatly enhance the researcher's experience. Knowledge of SL scripting language, Linden Scripting Language or LSL, is a distinctive advantage. LSL enables content creators to attach scripts to objects and thus to add or modify behaviours for example generating animations, object interaction with avatars and interaction with other objects. There are very useful online tutorials published on the SL Wiki and LSL classes are offered by the many inworld training centres such as the Academy of Second Learning

(http://slurl.com/secondlife/eson/32/162//). There are also quite a few publications on the more technical aspects of SL such as Jeff Heaton's books *Introduction to Linden Scripting Language for Second Life* (2007) and *Scripting Recipes for Second Life* (2007) and, *Scripting Your World: The Official Guide to Second Life Scripting* (Moore et al. 2008).

3.8.3 Supporting and Enhancing Participation: SL Cultures and Inworld Rules

Researching SL educational opportunities requires the participation and co-operation of learners and, depending on the type of projects, of other SL users and communities. Learners who are new to virtual environments will have to open an account, create their own avatars, acquire new skills, knowledge of inworld rules and etiquette. Virtual worlds are populated by avatars, often organized in formal groups or more informal communities, each land owner and each virtual group can set rules and regulations for the activities that occur in their virtual plots (Boellstorff 2008; Meadows 2008). Some projects involve taking students out into the wider SL environment, knowing how to behave when visiting other communities is essential for the success of such expeditions. Community rules are often clearly advertised at the point of entry, it is important for students and educators to respect the environment that they are visiting. However, very often educational projects are conducted in a specific location, identified as the home for the project, and within a delimited group of participants. In such scenarios it is appropriate to establish a group that is limited to the designated members and can be managed by the project leaders. This would allow users to establish a sense of community, maintain privacy and manage access to tools and sessions; users would be far more reassured that their participation and activities are protected by the rules of that community. Another serious issue when researching SL is the presence of griefers, these are avatars that enjoy disturbing, or even attacking, other avatars and that can infiltrate groups and activities and seriously disrupt the project (Bugeja 2007). Knowledge of group and land management tools and of the mechanism for reporting abuse (http://secondlife.com/policy/security/harassment.php) is essential to avoid griefing problems.

3.9 Disseminating Results

SL is not just a virtual environment, it is primarily a community where members are encouraged, and sometimes expected, to collaborate and share their experiences. Disseminating research results, or at least the summary of the results, via the many SL communication and media tools is a way to contribute to the growth and development of the community. This can be achieved by setting up dedicated spaces for the project where visitors can obtain information via notecards, presentations, chat boxes, references to web sites and other self-running tools. It is also quite

common to organize inworld research seminars and even conferences. Research seminars are regularly advertised via the SL search facilities and group notification systems. Joining one of the many groups dedicated to education is the best way to share information about educational projects. The SL Research Listserv e-mail list (http://list.academ-x.com/listinfo.cgi/slrl-academ-x.com) is also a valuable source of information on research projects, groups and potential venues for dissemination.

Besides the well-established academic journals dedicated to e-learning research there are now a few new periodicals focusing on virtual environments such as the Journal of Virtual Worlds Research, a peer-reviewed online academic journal http://jvwresearch.org/.

3.9.1 Inworld Conferences, Education Groups, Media and Press

There have been a few inworld conferences exclusively dedicated to learning and education research. In May 2007, 1,300 educators from all over the world gathered at the SL Best Practices in Education: Teaching, Learning, and Research 2007 International Conference (http://slbestpractices2007.wikispaces.com), this conference was conducted exclusively inworld. Another inworld conference, the Virtual Worlds Best Practices in Education Conference (VWBPE 2009), was held in March 2009. In September 2008 the SLEDcc the SL Education Community Conference (http://sledcc.wikispaces.com/) took place in Tampa, Florida (US) with inworld sessions. Research seminars and opportunities to present research findings are also offered by the many SL educational islands and associated groups. The European University Island (http://simteach.net/eui/) is a non-commercial project managed by a German non-profit organization based in Munich. Education UK Island "is a not for profit educational island constructed in SL to provide a 'safe' location for U.K. virtual education" (http://www.sleducationuk.net), the International Society for Technology in Education – ISTE "sponsors an in world group, hosts weekly networking socials and topical events, and sponsors a weekly speaker series" (http://www.iste.org/secondlife). Researchers working in SL often publish results in blogs, an excellent example is the SL Research Blog (http://secondliferesearch.blogspot.com/). SL has its own news and entertainment media, with periodicals, radio shows and machinima being used to report on inworld events. Although not academic in nature, these media channels are excellent vehicles for the advertising of events and projects. Examples of SL related media are: the Second Life Herald http://www.secondlifeherald.com/ and the New World Notes http://nwn.blogs.com/, Life For You TV channel (http://www.lifeforyou.tv), SLCN Virtual TV (http://www.slcn.tv).

3.10 Conclusion

Educators worldwide are exploring new ways to use communication technology to enhance teaching and learning. Virtual worlds such as SL offer exciting opportunities for educational projects and a new area of inquiry for education

researchers. The above overview of tools, research issues and opportunities for sharing of experiences is intended to support those interested in starting researching education in SL. However, this is just the beginning of a new era in networked communications and networked education; there is a need to further investigate, refine and design new tools, new approaches and new methodologies for virtual world learning and research.

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Chapter 4
The Schome Park Programme: Exploring Educational Alternatives

Peter Twining and Shri Footring

Abstract The Schome Park Programme set out to extend thinking about what the education system for the information age (Schome) should be like. The first three phases of the programme spanned 13 months and involved the use of Schome Park, our "closed" island(s) in Teen Second Life™ (TSL) virtual world alongside a wiki and forum. During this time approximately two hundred 13–17 year olds and around 50 adults were given access to Schome Park. Having explained the context in which this work took place the paper outlines the initial educational design underpinning the programme and describes some of the activities which took place. It goes on to explore some dimensions of practice which emerged from the data analysis towards the end of Phase 3, focusing on learner experiences of experimentation, playfulness, curriculum, choice, participation and the expression of the learner voice.

4.1 Introduction

4.1.1 The Context

The Schome Initiative set out in 2004 to design Schome, an education system that would meet the needs of individuals and society in the twenty-first century. Whilst the name Schome was formed from a merger of the words *school* and *home*' Schome was envisaged as being a system that would support people learning throughout their lives, from the cradle to the grave. Unlike other initiatives to transform education the Schome Initiative took the view that you needed to start with a vision of the ideal education system to genuinely meet the needs of society and individuals in the twenty-first century unconstrained by pre-conceptions of existing education systems. Thus Schome would have to address the need for education systems to provide custodial care for some learners some of the time, which suggests that Schome

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would have to have physical locations as at least one element of its provision. Having established a vision of the optimal education system for the twenty-first century (i.e. Schome) the next stage would be to devise a strategy for moving from our current systems to Schome.

Initial work on developing visions of Schome involved looking at different approaches to education and existing education systems around the world (see http://www.Schome.ac.uk/). Analysis of these resulted in the Educational Programmes Typology (Rix & Twining 2007), which identified key high level features of Schome (see Table 4.1).

This "desk research" was complemented by explicit vision building activities with focus groups, which were set up to include people expected to have diverse views on what an effective education system should be like, such as home educators (see Sheehy & Bucknall 2008). Subsequently the Aspire Pilot set out to work with secondary school pupils and teachers in two schools over a period of seven months to develop visions of Schome. The Aspire Pilot involved a great deal of activity to extend the participants, thinking about learning and how it could be effectively supported, including working with consultants who specialised in extending creativity through drama, role play and "impossibility thinking" (see Craft, Twining and Chappell 2007). The visions that emerged from the focus groups and the Aspire Pilot were limited to provision for compulsory education and tended to be very similar to existing schools. These visions focused predominantly on the surface features of school such as the physical environment, rather than deep educational structures such as curriculum, assessment, accountability, roles and power relationships.

The limitations in people's thinking about Schome were perhaps hardly surprising given that all those involved were immersed in a society in which school is the dominant educational model. People's thinking is inevitably informed and constrained by the social contexts in which they operate. Thus, for example, Engeström et al (2002, p. 211) identified that it is "very difficult for school communities to collectively analyse and redesign their practice". Given the pervasiveness of "school" and "college" it is hardly surprising that most people's educational world views are limited (at least within the developed world). This led the Schome Initiative team to suggest that we might enhance people's ability to think more radically about what Schome could/should be like by providing them with radically different experiences of education. Virtual Worlds seemed to offer the possibility to do just that.

4.1.2 Why Use a Virtual World?

Virtual worlds are online applications in which users, represented by an avatar, have the facilities to interact with each other and the virtual space. Traditional virtual worlds, such as World of Warcraft, are designed with specific missions/goals in mind and the environment that users create is pre-scripted (and thus constrained) by the application's designers. Virtual World Platforms (VWPs), such as Second Life™ (SL), provide tools which enable users to create their own environment and control the way in which objects behave. The technical limitations on what a user

Table 4.1 The educational programmes typology (Rix & Twining 2007, p. 337)

Type	Programme title	Programme length	Dominant educational approach	Degree of learner choice	Opportunities to access setting	Age range	Regulation	Location
Type 1	Alternative	Long or short term	Creative	High	Limited	Up to 18	Systemic	Fixed sites
Type 2	Last chance	Short term	Discipline	Low	Limited	Up to 18	Systemic	Fixed sites
Type 3	Remedial	Short term	Therapy	Low	Limited	Lifelong	Systemic	Fixed sites
Type 4	Special	Long term	Therapy	Low	Limited	Up to 18	Systemic	Fixed sites
Type 5	Home	Long or short term	Creative	High	Limited	Up to 18	Informal	Diverse sites
Type 6	Selective	Long or short term	Traditional	Low	Limited	Up to 18	Systemic	Fixed sites
Type 7	Comprehensive	Long or short term	Traditional	Low	Open	Up to 18	Systemic	Fixed sites
Type 8	Schome	Long or short term	Creative	High	Open	Lifelong	Systemic	Diverse sites
Type 9	Adult	Long or short term	Traditional	High	Limited	Post 18	Systemic	Fixed sites

can do within a VWP are due to the sophistication of the building and scripting tools provided and the user's competence in using them.

VWPs appeared to have a number of features that make them an ideal vehicle for extending thinking about future education systems. Firstly, they provide a way for people to have "lived experiences" which would be difficult or even impossible in the physical world. For example, setting up the Schome Park Programme's community in an VWP was more feasible than creating such a community from scratch in the physical world because of the costs and logistics involved. Secondly, our experiences of VWPs suggested that they encouraged experimentation, playfulness and breaking of physical world conventions. For example, the way in which avatars behave and interact in meetings in VWPs tends to be much more informal and fluid than in similar meetings in the physical world. Thirdly, VWPs provide new forms of representation and interaction with your (virtual) environment. For example, when setting up a shop in an VWP storage space is not an issue as any item can be represented by its name in an inventory list. The object "materialises" in the virtual environment when activated but can be reduced back to its name in a list with a click of your mouse. Similarly, buildings take on a different significance in a VWP because they no longer serve physical world purposes such as protecting you from the elements, or providing a structure in which to locate furniture (a display board doesn't need to be attached to a wall in a VWP as it can float in mid-air if you wish). This last feature of VWPs seemed particularly relevant in the context of the tendency of people to focus on physical space aspects of education systems in our earlier vision building activities rather than on the deeper structures.

In early 2006 SL virtual world was the optimal example of a VWP and became a core element within the next stage of the Schome Initiative's work – the Schome Park Programme.

4.2 The Schome Park Programme

4.2.1 Overview

The Schome Park Programme (SPP) started in the autumn of 2006, with a small team of staff developing their expertise in SL in preparation for the first cohort of students early the following year. The primary aim of the SPP was to extend our thinking about visions for Schome – the education system for the information age. Subsidiary aims related to the educational potential of virtual worlds and in particular the extent to which learners developed knowledge age skills such as collaboration, "real" problem solving, communication, and learning to learn.

Schome Park, our island in Teen Second Life™ (TSL), was set up as a secure space that was only accessible to specific avatars. It is closed in the sense that avatars are contained on Schome Park; they cannot travel from Schome Park to any other part of TSL or SL or visa versa. The students were all aged between 13 and 17 due to the restrictions imposed by Linden Lab, the company that hosts TSL. All

Table 4.2 Summary of eSIR reference statement (from Twining et al. 2006, p. 14)

Aims	"Smarter learners better able to cope with changing contexts" – focus on enhancing learning, motivation and lifelong learning as important elements of this
Environment	The learning environment is the whole environment of the learner that is recognised as being relevant to the education system. It has two components: • The spatial environment – where learning takes place • The temporal environment – when learning takes place. Both the spatial and temporal environments that are considered relevant to the education system will expand. In particular there will be greater emphasis placed on the home, working across physical settings and virtual settings, and extending the school day. This is all summed up in the phrase "anywhere/anytime learning"
Actors	The actors are people and/or organisations involved in supporting learning, including teachers, support staff, learners, learners' peers, parents and employers. There will be an increase in the involvement and availability of actors owing to the facilities that ICT offers, especially in relation to interaction "at a distance". In particular, greater emphasis will be placed on the role of parents. Collaboration will be a key element to this diversification of actors and environments Learners' choice, responsibility and control will become increasingly important as part of the personalization agenda
Curriculum	The curriculum includes everything that learners learn. There will be a broadening of the curriculum both in the subjects available and in learner choice. In particular, the curriculum is likely to offer more vocationally-oriented options, and will place a greater emphasis on core skills
Support	The range and nature of support, which includes teaching, will increase and diversify as the environments, actors and curriculum expand. In particular, there will be an increase in learner choice about when, where and how learners are supported

adults involved in the programme had current enhanced Criminal Records Bureau enhanced disclosure clearance or the international equivalents.

The initial design of Schome Park was closely linked with the eSIR Reference Statement (Twining et al. 2006) that is summarised in Table 4.2. The eSIR Reference Statement was developed to provide an indication of the implicit vision of "good practice" within the British government's eStrategy (DfES 2005). As such the eSIR Reference Statement complements the Educational Programmes Typology (Rix & Twining 2007) by providing a different level of granularity of analysis focusing on different facets of provision.

During its first 18 months SPP progressed through three phases of activity with students. Table 4.3 shows how the design of SPP related to the eSIR Reference Statement during each of these phases. The eSIR Reference Statement provides a high level description of how the design of SPP changed over time. Thus, Table 4.3 is an overview, which conceals some important dimensions of practice which emerged from comparisons across the three phases.

Table 4.3 An overview of the first three phases of the Schome Park Programme

Aspect	Phase 1 (March to April 07)	Phase 2 (June to December 07)	Phase 3a (January to March 08)	Phase 3b (April to May 08)
Our focus (aims)	*To* explore the educational potential of virtual worlds (with a particular focus on developing SL skills and "Knowledge Age Skills") *To* build a community of learners	To create a learning environment with culture of open participation and support for learning in accordance with the Schome ethos		
		To enhance "Knowledge Age Skills". *To* increase student control and responsibility for the environment, the curriculum and support. *To* widen the community (not just gifted and talented)	*To* enhance "Knowledge Age Skills". *To* balance control and responsibility for the environment, the curriculum and support. *To* widen the community and increase its size. *To* explore the co-existence of the Schome ethos with school culture	
Environment	Island divided into six areas: physics; ethics and philosophy; archaeology; Scho-op (generic support); shared meeting areas; sandbox	Island as naturalistic and attractive environment with some core generic areas – student control of planning/building	Two islands: One student controlled + one staff controlled. Immersive game theme for new island	Two islands. Project teams allocated plots of land with full controls (e.g. terraforming)
	Island, wiki and forum available 24/7/365			

Table 4.3 (continued)

Aspect	Phase 1 (March to April 07)	Phase 2 (June to December 07)	Phase 3a (January to March 08)	Phase 3b (April to May 08)
Actors	149 students aged 13–17, from the National Association of Gifted and Talented Youth (NAGTY) Staff from four universities Staff from the National Physical Laboratory; PhD students; Consultants	Ongoing students from Phase 1 New 13–17 year old students from range of sources (inc USA)	Ongoing students from Phase 2 New 13–17 year old students from range of sources, including: South East Grid for Learning (broadband consortium) and "School groups" from UK and USA	
		Staff from two universities; PhD students; consultants; teachers; independent participants		
Curriculum	Three strands of formal activity (physics, ethics and philosophy, archaeology) + discrete "taught sessions" + student led activity	Student led activity (inc continuation of some formal strands from Phase 1) + some new staff led activities	Student led activity (inc continuation of some Phase 2 strands and new strands and activities	Major focus on projects led by students and/or staff
Support	Staff scheduled sessions for each formal curriculum area	Focus on peer–peer support, with reduced levels of staffing	Peer–peer support with greater focus on staff support for strands of activity and for student led activity	Participant support (staff and student) focused on projects
	Peer–peer support; Information in wiki; Discussion in forum; Emergency help button to summon staff			

4.2.2 Phase 1

In early March 2007 the first cohort of 149 students was given access to Schome Park and the Schome wiki and forum (http://www.Schome.ac.uk). These students were dispersed around the UK, and whilst some of them knew each other via the NAGTY forums, and one or two knew each other in the physical world, the vast majority of them were strangers to each other. All of the students were accessing Schome Park in their own time rather than as part of their school activity.

Whilst formal induction sessions were organised for the students in Schome Park, these proved ineffective. If students attended the sessions at all it was only briefly to say hello at the beginning of a session or if they were having a problem in which case they came back to ask for help. Initially student activity focused on individually exploring Schome Park and experimenting with changing their appearance, buying things from the Scho-Op virtual shop and trying their hand at building. They then started to attend the sessions organised as part of the three main strands (physics, archaeology, and ethics and philosophy) and commenced work on activities of their own devising. Despite the staff's encouragement for students to work together and help each other the students tended to work on individual projects to begin with. Thus, for example, several students each developed their own separate "learning centre" to help other students learn how to build in Schome Park. As students became more familiar with the environment the nature of activity diversified, with students organising activities such as a regatta, a murder mystery evening and a wedding.

The students were free to build anything they wished in the air 250 m above Schome Park. The amount of building was prolific and there started to be difficulties due to there being too many prims (objects) for the server to manage. The only way to resolve this was to delete around one third of all the objects on Schome Park. This was a real problem that the community had to resolve, which helped to focus the students on the needs of the community (rather than their individual projects). Thus, for example, it was agreed that it made much more sense for the students to collaborate on one centre to help other students learn how to build rather than having three separate ones. This tied in with the push for students to take greater control of and responsibility for Schome Park. Discussions about possible government structures took place, and towards the end of Phase 1 a student organised government structure was agreed, with seven departments including: Education, Safety, Government coordination, Scripting, and Building and Planning permission.

Phase 1 could be characterised as a time of experimentation. The students were positively encouraged to work together (rather than individually) and to feel safe in trying things out and making mistakes.

4.2.3 Phase 2

One of the criticisms of Phase 1 was that the students were atypical because they had all been identified as being gifted and talented. In Phase 2 the community was

opened up to any 13–17 year old who wished to take part and approximately 100 schools were asked if they would publicise this opportunity to their students. In addition contact was made with a number of other organisations, such as pupil referral units, City Technology Centres and the South East Grid for Learning. The majority of the new participants signed up in ones and twos over the course of Phase 2. 34 of the original Phase 1 students asked to join Phase 2 and regained access to Schome Park on the 15th June 2007. Of these 21 spent more than 5 hours each in Schome Park during Phase 2. Part way through Phase 2 a group of 14 students from an after-school club in the USA joined the programme. These students met face to face in the physical world once a week with the teacher who had established the club, in addition to engaging with the programme at other times. The changes in the student population were accompanied by changes in staffing, with a shift towards greater reliance on external staff (adult participants) who were not paid by the project.

Whereas in Phase 1 students had started by going straight into Schome Park new students in Phase 2 were asked to sign into the forum and find a buddy before going into Schome Park. The buddy system was intended to help new members of the community over the first stage of entering Schome Park, which we knew from Phase 1 was a time when many students left the programme. Of the 51 new avatars created in Phase 2 only 23 ever ventured into Schome Park, with 13 of these spending more than 5 hours each in Schome Park.

Following the perceived success of student led events in Phase 1, and the departure of the original strand coordinators, it was decided to focus in Phase 2 on student initiated activities. This was reflected in the redesign of the island between Phases 1 and 2, which involved removing all the designated teaching areas linked with specific strands. The students (through the government structures such as the planning department) were given responsibility for, and control of, all building anywhere on Schome Park. Discussion boards had been established in the forum for each of the government departments towards the end of Phase 1. Perhaps inevitably, the continuing students from Phase 1, who were most familiar with the forum and who already knew each other, were elected as the officers in the various government departments.

The planning department set about developing rules for managing building activity so as to ensure that the prim limit was not exceeded. A small number of students were very active in proposing and discussing planning applications in the forum. They also monitored building activity in Schome Park in order to ensure it complied with the planning rules. One of the unintended consequences of this was that building became concentrated in the hands of a small number of students, most of whom had been part of Phase 1. To try to counteract this a large sandbox, where anyone could build without needing planning permission, was created in October 07 (roughly half-way through Phase 2).

A wide range of informal activities took place in Schome Park during this period, many of which were not publicised on the events page in the wiki and thus were only attended by small numbers of students who had been directly involved in their organisation or happened to be in Schome Park at the time.

With encouragement from staff a regatta which spanned three days was organised by the students. The preparation for this took several weeks and involved the

students in setting up pages in the wiki, creating courses and maps showing the routes, building boats and writing scripts to control them, devising mechanisms for starting the races and calling back boats if there were false starts, publicising the races, and ensuring everyone understood the rules for different categories of boats.

With support from their teacher the students from the after school club engaged with the wiki and forum as well as starting work on a collaborative group project to develop a skateboard park in Schome Park (having first obtained planning permission). They also participated in and organised a range of other activities both as a group and individually. For example, one student organised a series of popgun games, having first negotiated to ensure that nobody would be upset at the use of popguns (in designated areas at specific times).

One member of staff organised and led a project to create a machinima (a film inworld) of the real story of the Hindenburg disaster. This involved over 20 scheduled 2 hours sessions as well as many hours of individual student work at other times in Schome Park, using the forum and wiki, and editing the video clips. The project involved: writing the script, creating the scenes and props, acting out and filming the scenes, editing the video clips, adding sound tracks, and merging the clips to create the final film (which can be seen at http://Schomepark.blip.tv/).

Phase 2 could be characterised as a period constrained by well intentioned bureaucracy and dominated by the core students, most of whom had also been active in Phase 1.

4.2.4 Phase 3

In an attempt to overcome some of the problems evident in Phase 2 some substantial changes were planned for Phase 3. A second island (Schome Park beta) was set up adjacent to the original island (Schome Park alpha) and the sandbox on Schome Park alpha was expanded so that it took up around a third of the island. It was agreed that the students (i.e. the government) would retain responsibility and control of building on Schome Park alpha, whilst the staff would manage Schome Park beta. In late March 08, just over half-way through Phase 3, it was decided that the changes had not had the desired effect and the management of Schome Park alpha was totally overhauled in order to remove the planning permission restrictions. Instead of people having to ask for permission to build, teams working on particular projects were allocated parcels of land which they had total control over.

The focus of recruitment also changed before the start of Phase 3, moving from targeting individual students to bringing in school groups. The engagement and retention of students from the after-school club in the USA suggested that introducing pre-existing groups of students would make it easier for new members to establish themselves as part of the community than was the case for individual students. Similarly, the intention was that 200 new students from the South East Grid for Learning would all gain access to Schome Park together at the start of Phase 3. In practice 38 students joined Phase 3 from Phase 2, and 70 new avatars were created,

40 of which joined part way through Phase 3. 24 students from Phase 2 and 30 new students spent more than 5 hours each in Schome Park during Phase 3. 18 new staff, most of whom were volunteers (in the sense of not being paid by the programme), also joined at various points throughout Phase 3.

Student-led projects continued, with a small number of established students being very active. For example, one student (Student1), who had been part of all three Phases, was engaged in a large number of projects, including setting up a vehicle building group "Animotion" and creating a racetrack fully equipped with starting lights. This developed quite a following and small groups of avatars could often be found racing the vehicles they had created around the track. This same student worked hard to support new students and help them develop their building skills.

Another student, who had joined in the second half of Phase 2, developed a Steam museum equipped with replica steam engines and displays of information. This expanded to include a steam train with railway track, which was used in the filming of a machinima called "Murder of a gentleman", which can be viewed at http://www.Schomepark.blip.tv/#978362.

Students in one of the school groups (the SpARTans), who joined in Phase 3 and were using Schome Park during school time, worked in pairs on projects of their own choosing. These included: organising a wedding, recreating a humorous Schome Park version of the Boston tea party; building a replica of a 1960s American diner; setting up a lemonade stand; holding a music recital; developing and playing a game of chess; producing a guided tour of Schome Park; setting up an X-Wing dealership (selling spaceships); and creating a spaceship and travelling to the moon. These students then created videos about their projects which included physical world filming as well as machinima (see http://www.Schome.ac.uk/wiki/Second_Life_demos#Schome_Park_videos)

Whilst student-led projects were still strongly encouraged, staff-led strands of activity again became a priority for supporting learners. For example two staff organised a series of interactive art sessions in which each student created an object which would play an audio track when an avatar approached. This involved the students in: building their objects; creating images and uploading them to add as textures to their objects; creating the audio tracks and uploading them; editing the objects' scripts so that they played the correct audio tracks; arranging their objects in relation to each other so that as you walked around the audio tracks interacted with each other.

Another member of staff organised a strand called "Savvy Avvies", with the intention of providing a regular scheduled activity where both newcomers and established folk would feel welcome and which would help:

- newcomers to develop basic SL skills and be adventurous about altering their avatar's appearance;
- the more experienced to be adventurous about creating and uploading their own textures, and using and modifying freely available scripts (and to learn how to find out further information if required).

Underpinning the Savvy Avvies strand was a desire to support other strands of activity, for example by creating togas for the history group, and to help new members of the community to feel more included by blurring the differences in appearance between:

- newer staff whose avatars had been created directly on Schome Park and some established staff who had brought complex non-transferable items from SL;
- new students and established students who had learnt to create complex items to enhance their appearance.

Another project within Phase 3 was linked with an external competition; the Surrey Satellite Technology Ltd and British National Space Centre competition to design a space experiment to be flown on board a British-built satellite (see http://www.bnsc.gov.uk/content.aspx?nid=7254).

This project involved a group of students working as a team to develop their submissions over a prolonged period of time (indeed as the team reached the finals of the competition they had to carry on working past the end of Phase 3 of the Schome Park Programme). Three members of staff coordinated the team's activities and provided them with expert input, help and guidance. The work of preparing the proposals predominantly involved using the wiki and forum.

Phase 3 could be characterised as representing a shift towards supporting groups of students who were committed to specific projects, with externally specified constraints.

4.3 Research Methodology

The research methodology within the SPP merged features of case study and quasi-experimental design. A learning environment was created within which certain variables, such as the curriculum and the design of the virtual space, were varied over the phases of the programme (see Table 4.3).

All participants involved in the SPP were aware that they were taking part in a research project. In keeping with BERA's ethical guidelines (BERA 2004), all the students and their parents signed informed consent forms, and had the option to withdraw their data from the data analysis at any point without explanation.

Over the first three phases a range of data was collected, including:

- chatlogs of conversations that staff were privy to in Schome Park (text chat was used instead of voice within Schome Park and staff were required to have a note above their avatar's head at all times which said they were logging chat);
- inworld photographs of activities taking place and the artifacts created;
- entries by students and staff in the forum, wiki and blogs (a small number of which included explicit reflections upon the students' experiences of learning within the SPP);
- informal interviews inworld and via the forum and Flashmeeting (http://flashmeeting.open.ac.uk);

- sensor data showing the location of all avatars present on Schome Park once every five minutes (though these were of variable reliability over time);
- usage data for the schommunity wiki and forum.

The data analysis for this chapter drew particularly on a series of informal interviews conducted by the second author.

4.4 Dimensions of Practice

In looking back over the activities and approaches evident in the first three Phases of the Schome Park Programme a number of differences were evident, which can be encapsulated in the form of dimensions of practice. These appear to have relevance in comparing and thinking about learning in any context. Due to space limitations only three sets of dimensions are described here.

4.4.1 Experimentation vs. Control

There were clear differences between Phase 1 and the other Phases in terms of the degree to which students felt able to experiment and learn from their mistakes. This could be thought of as a Playfulness dimension. Throughout all three phases staff persisted in trying to create an ethos in which making mistakes was recognised as being an essential part of the learning process and therefore something to be valued. However, in Phases 2 and 3 the "established" members of the community were often unsupportive of "newcomers" who made mistakes:

> Staff 2 How do you feel the newer people have formed their views on this subject [the Schome ethos]?
>
> Student 3 It seems as though in too many cases it's been through making a bad misjudgement [sic] about what the ethos is and being strongly reprimanded by the alrwady [sic] existing members, or through seeing this happen to someone else. Being more tolerant of the mistakes would be much preferable, but I can't claim to do it myself, so I think I have to do some eye-plank extraction already.:-) (Extract from interview)

The change in degree of playfulness was most evident in terms of building in Schome Park. There was a noticeable shift from most people initially having a go at building in Phase 1, to a small core of students dominating most of the building activity during Phases 2 and 3. The following quotes from the forum highlight that members of the community were aware of the problem and concerned about how to reverse the trend:

> Re: Moving from Phase 2 to Phase 3
> From Student 1
> I think I'm not going to build anything in the new area. I want someone else to have a go!
> It's not a great feeling owning everything (well obviously not everything, but you know)
> I dunno, maybe its the feel good music speaking, but it's a good resolution i think 😃
> Re: Moving from Phase 2 to Phase 3

From Student 2

I think that's a bad idea <Student 1> – you're one of the better builders, and it wouldn't be putting your talent to use, would it? New people need to have the courage to build, and the ability to learn, but I think existing builders should carry on.

Re: Moving from Phase 2 to Phase 3

From Staff 1

I actually agree with <Student 1> on this one – I think that the current building is totally dominated by a small handful of people and everyone else is being excluded. Now I know that is not intentional – and agree that the quality of builds has increased, but that is perhaps part of the problem: you kind of feel that you can't build well enough and so don't try and so don't learn.

So I certainly think that existing builders should carry on – but we need to find a way to enable/encourage other people to have a go (even though we know that what they build will initially be less sophisticated – indeed because we know that you need to go through a process of building stuff badly before you can build it well!) – it's like everything in life, you learn from doing it and gradually refining your skills.

. . .

There seemed to be two key dimensions underpinning this shift, which might be labeled the Regulation dimension and the Product-Process dimension.

The Regulation dimension is evident in the change in complexity of the rules for who could build on Schome Park. In Phase 1 anyone could build anywhere above 250 m without having to ask permission. In Phase 2 you had to obtain planning permission from the Planning department before you could build, and it could take weeks of negotiation and debate before a decision was made. Indeed some students started to question the degree of control that the Planning department exercised:

Re: Too much control?

From Student 2

Yes, well. The things that happened last week suggest people think we have far too much control. But as I said before, the only work we do is on the forum, and all we do in world is looking round for builds and doing prim counts.

Whilst some of the dominant builders rejected this claim, other members of the Planning department recognised the impact that the increased bureaucracy was having:

Staff 2: How do you feel the community and governance side of things has worked?

Student 3: "I've got a very biased view of it, having tried to push and keep Schome as something of the liberal communist utopia wherein my political beliefs lie. In this respect, the government was great for giving at least the sensation of power and responsibility, and I like to think it's kept the community together quite a bit. Having said that, I ended up being rather pragmatic, and the bureaucracy, which I'm to a large extent responsible for, started to cause quite a lot of friction. With hindsight, I was too keen to keep the status quo rather than try new things, and so the government became, clunky, as it were-we ended up having rather a lot of disagreements not only over particular builds but over the system as a whole. I guess everyone was so involved in our own projects, our own ideas of how Schome should be, we lost the focus somewhat that, in the end, the government was meant to be a means rather than an end. (Extract from interview)

This insightful comment reflects a change on the Product-Process dimension in relation to the government. This shift was also evident in relation to building and

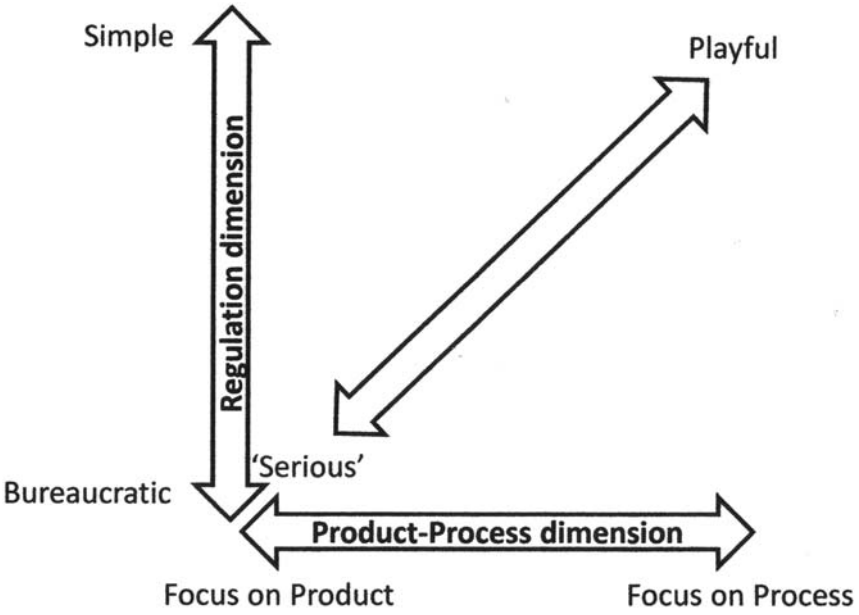

Fig. 4.1 The Playfulness dimension

buildings with a growing focus on the quality of the finished products rather than on the process of learning to build:

> Re: Summary Of Schome: <Student 4>
> From Student 3
> . . .
> As regards the groupings in Schome, I do think it is a shame that tiering formed itself, with only a few people doing most of the action in each area, although this doubtless meant that what was made and done was of a very high quality. It certainly seems that many people were put off by seeing others do much better than their own first attempts. On the other hand, the differences in interest between people are probably the greatest cause for this- for instance, I've never become very involved in building, simply because I prefer doing other things (or more accurately, not doing much and talking about a lot of things). It's not necessarily a bad thing, with specialisations very useful, but the question is how to make getting involved in the already extant and 'matured' groups as easy as possible.

Clearly, there were other factors at play here too. However, there seems to be a relationship between the Regulation dimension, the Product-Process dimension and the Playfulness dimension, as illustrated in Fig. 4.1.

4.4.2 Curriculum Dimensions

The curriculum throughout the first three Phases differed along two dimensions. The curriculum choice dimension relates to the degree of choice that students had about

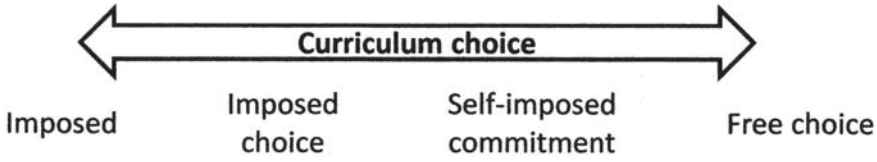

Fig. 4.2 The curriculum choice dimension

their engagement with an activity (see Fig. 4.2). Within Phases 1 and 2 the students were engaging in their own time and had total freedom of choice about whether to engage with activities or not (Free choice). At times this was problematic for an activity's organiser as students might sign up to say they were going to attend but not actually attend, or might not express an intention to attend but turn up anyway. Some students attended parts of sessions, arriving and/or leaving part way through them. With the competitions which were introduced in Phase 3 the students had free choice about whether to become involved or not, but those who wanted to be part of one of the competition entries had to commit to seeing through the process of submitting a bid (Self-imposed commitment). With the introduction of school groups of students working during school time came greater imposition of curriculum choice. For example, each of the students in the SpARTans group had the choice of engaging in the Schome Park Programme or doing some other activity in school time (this was Imposed choice as they had to attend school and had to choose between a small number of options). Typically in formal schooling students have a limited choice of subjects to choose from (Imposed choice) or no choice at all (Imposed).

The Curriculum definition dimension (Fig. 4.3), relates to who defines the curriculum (the "content" of the activity). "External" on this dimension means external to the student. Within the Schome Park Programme most of the individual activities were Self-determined, the students had total freedom about what to do. Collaborative activities inevitably required agreement within the group about what was going to be done (Freely negotiated). Thus for example, when it came to their paired project work the SpARTans freely negotiated within their pairs what their projects would be. The two external competitions provided specific restrictions on the scope of the activity and/or criteria for success that the entrants had to meet,

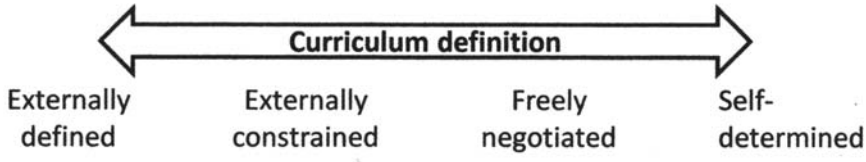

Fig. 4.3 The curriculum definition dimension

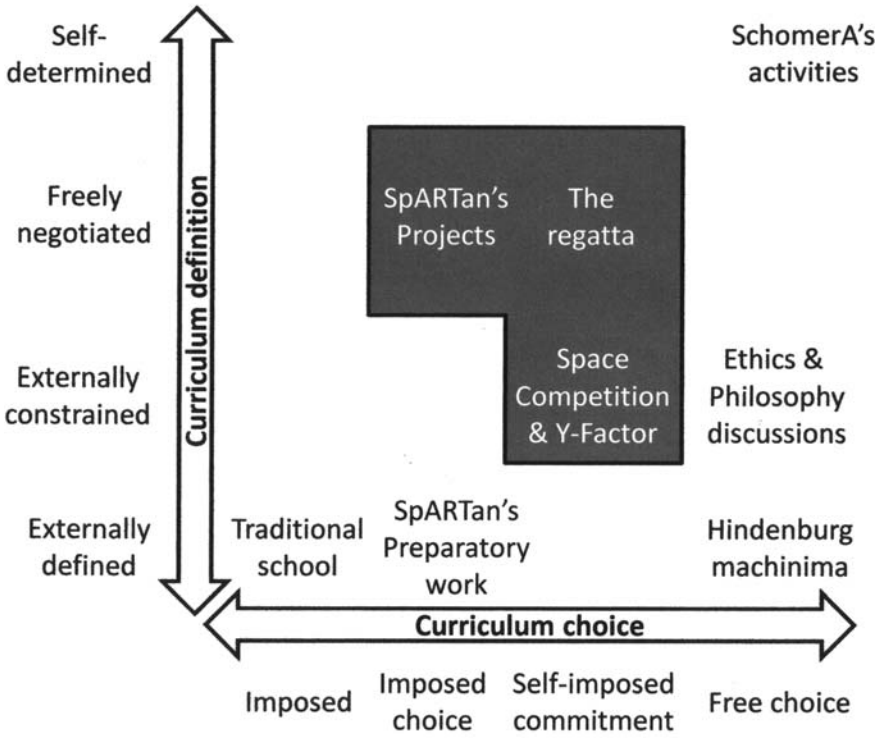

Fig. 4.4 Interaction of the two curriculum dimensions

but within those frameworks the students had a great deal of choice about exactly what to do and how to do it (Externally constrained). Similarly, in the Hindenburg machinima project the member of staff chose the focus on making a machinima about the Hindenburg disaster, though the students had a good deal of creative freedom. In the case of the SpARTans the curriculum was initially Externally defined, in that the teacher organised some introductory activities to prepare the students for their project work (e.g. a worksheet with closed questions about the Schome Park Programme; structured sessions which introduced the students to building and other inworld skills).

These two curriculum dimensions interact, as illustrated in Fig. 4.4, and the location of activities might vary over time as was the case for the SpARTans, whose original activities were externally defined (by the teacher) but whose project work was freely negotiated within each pair.

Our experiences within the SPP tentatively suggest that the most productive areas in terms of producing evidence of learning are those where students have considerable but not totally unconstrained choice (as indicated by the shaded area in Fig. 4.4).

4.4.3 Role and Learner Voice

The curriculum dimensions focus on choice, as this is one aspect of giving learners ownership of (and responsibility for) their own learning, which was central to the Schome Park ethos. Another key element of the ethos was to create an environment where all learners supported and were supported by other participants as equals (regardless of age or status). The design of Schome Park, in particular the use of an VWP made it possible to move away from the idea that adults were recognised as "the experts" to a model where all were recognised as having something to offer, thus enabling participants to play a variety of roles within the Schome Park environment that included Schome Park as well as the web based elements such as the wiki and forum.

Different individuals demonstrated varying levels of expertise in a wide variety of areas. Here, we are focussing on a small number of technical skills:

- Skills relating to the use of virtual worlds;
- Skills relating to using a wiki and forum to support learning;
- Digital media processing skills.

Consideration was also given to how learners were able to communicate these in a useful way to other learners who were interested in developing their expertise in these areas.

There is strong evidence that the level of expertise of individual members of the community in these technical skills increased considerably over the course of the SPP. We cannot claim that this was due solely to their involvement in the SPP, but it seems reasonable to assume that where participants were actively engaged in activities involving the use of the Schome Park environment over a prolonged period of time that these played some role in the observable increases in competence. The level of expertise in these technical skills can be thought of as a "technical expertise dimension" (see Fig. 4.5).

A person's ability to use their expertise to support other people's learning is dependent upon their perception of and confidence in their own knowledge and abilities. It is also reliant upon their level of engagement within the community, both in terms of their willingness and ability technically and socially to participate in the learning environment. This is framed in Fig. 4.6 in terms of a participation dimension. Within this dimension an individual might be actively engaged as a member of the community but still be marginalised because the community refused to accept their contributions.

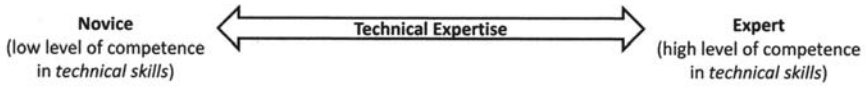

Fig. 4.5 The technical expertise dimensions

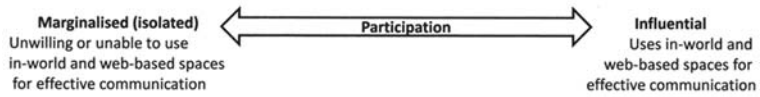

Fig. 4.6 Participation dimension

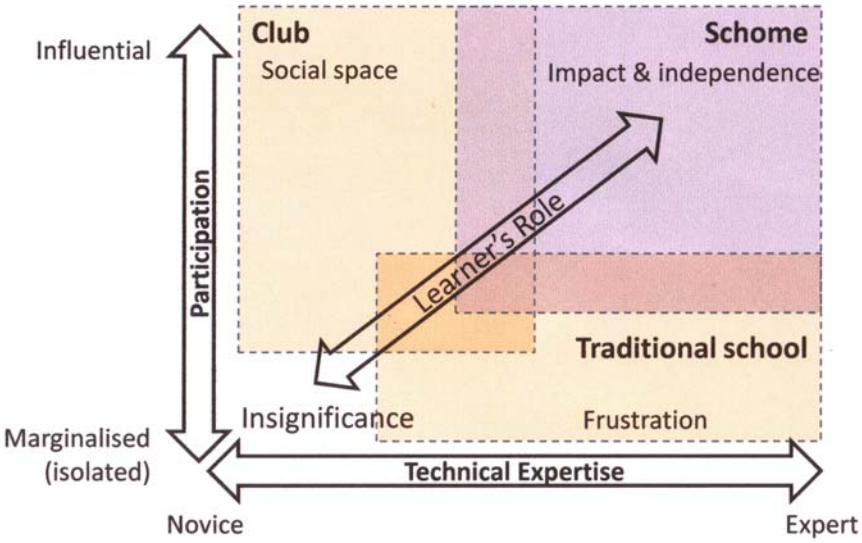

Fig. 4.7 The learner's role dimension

The Technical Expertise and Participation dimensions interact, as illustrated in Fig. 4.7, to create a Learner's Role dimension.

Within the Schome Park Programme there was evidence of individuals moving between different positions in relation to the Learner's Role. This is illustrated here in relation to one student (Student 2) within the community.

Insignificance (lack of impact or influence within the learning community): In reflecting on his early experiences in Schome Park Student 2 reported that when he joined the SPP he had very low levels of technical expertise and looked to other community members for support:

> Re: Supporting each other in the Schome Park Environment
> From Student 2
> . . .
> I found help in the very first few weeks from the staff, like Staff 3, Staff 4, Staff 5 and Staff 1 (to name just a few). I was completely new to the environment and didn't have a clue what I was doing.
> I also remember that in the first few weeks, when Student 5 set up the very first SkyBase, he took me to some orange and purple squared building up at 5000 m or so and we chatted for a while getting to know each other. I then went for tea or something and came back to find Student 5 wasn't there. Being completely new I was scared to leave the building

because 1) I didn't have a clue where I was and 2) I was scared that if I feel into the greyness that was the sky then I'd lose my avatar

Frustration: Student 2 rapidly became an active member of the community and developed high levels of technical competence in terms of both his building skills and his use of the wiki and forum. Despite this he became frustrated at times by the community seeming to ignore what he had to say:

Re: Holding meetings in Second Life (some lessons learnt)
From Student 2
sorry about storming off was a bit annoyed that no-one replied, and also I did need to do something else, so I appologise now, and thank Staff 3 for letting me take the floor
Re: Holding meetings in Second Life (some lessons learnt)
From Staff 3
No worries Student 2, and very decent of you to post an apology
That was the first meeting I've chaired in SchomePark (or anywhere in Second Life!) and I think everybody in the meeting knew as much or as little as I did. I think we were all learning together about the best way of sharing ideas and coming to agreements, and if you read through my post above, I've tried to highlight some of the main points. I'd really appreciate feedback and thoughts from folks on how we should best run meetings in the future (or whether we do away with them all together).
Thanks to you all for your patience in what turned out to be much longer than expected!
Staff 3

Club: Student 2 made a significant contribution to social activities throughout the SPP. He spent a considerable amount of time in Schome Park (roughly 39 hours in Phase 1, 101 hours in Phase 2 and 97 hours in Phase 3), much of which involved taking part in a variety of impromptu activities such as vehicle races, or simply "hanging out" with other people. In many of these contexts his technical expertise was not being utilised, hence our classification of this as "Club" rather than "Influence, impact and independence".

Influence, impact and independence: Student 2 became very influential within the SPP. He took on a number of formal roles, including Officer in the planning department and moderator of several boards in the forum. More significantly, for example, he:

- played a key role in editing the wiki, providing support and advice for other members of the community both directly (as edits and comments on their wiki entries) and through the provision of more generic advice, including developing a template for Userpages (see http://www.Schome.ac.uk/wiki/Template:New_userpage);
- initiated and helped to develop the barnstar system, which was intended to provide recognition for community members' achievements (see http://www.Schome.ac.uk/wiki/Schome_Wiki_and_Forum_Barnstars);
- became actively involved in the buddy system, which was introduced in Phase 3 to help new members who were joining community.

Student 5: The buddy system was excellent though. It really helped. My buddy was Student 2. (Extract from interview)

The above examples illustrate that a single participant's position in relation to the Learner's Role dimension varied over time and situations, falling within each of the four quadrants within Fig. 4.7. The same was true for others, notwithstanding the fact that Student 2 was one of the students who spent the most time inworld.

Our experience was that participants joining the SPP already had considerable knowledge and expertise. For example, in the initial induction sessions in Phase 1 students arrived, looked around and then flew off to explore the island and start experimenting; they did not need hand holding in terms of how to control their avatars. Despite this, there is evidence that, initially at least, newcomers looked to adults for expert knowledge, guidance and support about what to do (rather than how to do it).

Towards the end of the SPP, the students were confidently (and often effectively) supporting newcomers in technical matters as well as communicating the "Schome ethos". Indeed some participants have noted that the teens were more expert in these areas than many of the adult participants. Despite this a small group of University staff (most of whom were funded part time by the SPP) continued to exercise a very high level of influence over the community in terms of the frameworks within which they operated and in particular over whose voices were heard. In the context of the ethos we were trying to create, where staff and students were seen as equal, this level of influence was an issue. The evidence suggests that in Phases 2 and 3 a dominant group of staff and students developed who found it difficult to recognise the wide ranging expertise that many of the new participants (both adults and students) brought with them, including some who had advanced technical skills.

The Learner's Role dimension could be thought of in terms of "learner voice". Within the SPP the indications were that the extent to which participants felt they had a voice may have affected their engagement with the programme as a whole. This seems at least in part to explain the high levels of drop out amongst new entrants to the community. Even amongst established members of the community there were times when people threatened to leave the community because they felt their voice was not being heard, indeed this applied to Student 2 at one point during Phase 2.

Despite these issues, the Schome Park Programme has demonstrated on a small scale that learners themselves can make a positive impact on the learning of their peers (regardless of age and status) when their expertise is recognised and valued and they are given appropriate tools and ownership of their learning environment.

4.5 Conclusions

The overarching aim of the Schome Park Programme was to help the Schome Initiative develop its thinking about visions for Schome (the education system for the information age) by giving learners a lived experience of radically different forms of education within TSL. Using a VWP allowed us to explore variables which would be difficult to manipulate in the physical world. For example, it allowed the identity of individuals to be obscured in ways that reduced the impact of overt signifiers of power and status such as age; this was seen as being important in order

to create a learning environment in which all were recognised as having something to contribute as well as something to learn. Inevitably, some aspects of this manipulation of variables were more successful than other. For example, as suggested in our discussion of the Savvy Avvies, other indicators of status emerged over time.

Throughout Phases 1–3 it became clear that the nature of the infrastructure was critical. It was important to have integrated spaces where learners could do things (Schome Park), discuss things (the forum), and record what they had done (the wiki). However, for these to be productive they needed to be moderated effectively (which should not be confused with being moderated by "the teacher"). Where, for example, the forum discussions became unfocussed and/or were dominated by a small core of established members of the community (whether they were adults or students), this seemed to hamper active engagement by the majority.

A key aim of the Schome Initiative's research has been to extend our thinking about education. Education systems can be defined in terms of their values and operational practices. The dimensions of practice enable us to compare specific aspects of different systems and approaches. As this paper has illustrated, the experiences within the first three phases of the SPP highlighted aspects of practice that are important in thinking about Schome (and indeed any learning environment). Thus it has been useful in focusing our attention on dimensions which might otherwise have gone un-questioned. However, Schome Park was never intended to be Schome, and whilst the dimensions of practice emerging from the SPP raise important issues to be considered it has not provided the answers. Judgments about the best place to be on these dimensions, and how to achieve that are complex and contestable, not least because they are likely to vary across contexts.

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Chapter 5
New Literacies in Schome Park

Julia Gillen

Abstract In this chapter I deploy a synthesis of methods I term virtual literacy ethnography to investigate the diverse literacy practices of the Schome Park project (SPP). This project worked with teenagers on the first European "closed" (i.e. protected) island in the 3D virtual world Teen Second Life™ (TSL) as described in the previous chapter. Firstly I introduce an ethnographic perspective on this lengthy, rich project and reflect on my own interpretive approach. Introducing my own focus of interest, the new literacy practices fostered by the environment and in particular activities I judge to be especially creative, I begin to develop the methodology of a "virtual literacy ethnography". I show how the diverse multimodal affordances of the communicative domains are imaginatively exploited by the students, supported by peers and staff in an environment characterised by "fluid leadership". I include some analysis of literacy work around a genre traditionally valued by educators, a dictionary, which I was not involved in at the time. I suggest this is an exemplar literacy practice, creative in itself and illustrative of the methodological possibilities and of course limitations linked with the technologies utilised. Traditional distinctions between "reading" and "writing" become permeable in interesting ways as new creative practices, fostered by the environment of the Schome Park programme, emerged. I offer support for Kress's (2005) claim that changes in writing and reading practices amount to a "revolution in the world of communication." In conclusion, I claim that virtual literacy ethnography, as I have proposed it here, can be fruitful in exploring the complexity and creativity of the students' literacy practices, although more developmental work is needed.

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5.1 Bringing an Ethnographic Perspective to Bear on a Virtual World: Schome Park

In this chapter I aim to explore a range of literacy practices taking place in Schome Park, a 3D virtual island, during a 13 month period (February 2007–March 2008). I do this from a perspective I term virtual literacy ethnography (Gillen 2009). My second aim, very much entwined with the first, is to develop in practice an appropriate methodology to enable the analysis of the phenomena I am exploring. I shall endeavour to demonstrate that new literacy practices are best approached by a new synthesis of methodologies.

First, in this introduction I explain the specific understanding of ethnography I bring to this project. Later I shall be more specific according to my interests and develop the term "virtual literacy ethnography" but an essential initial step is to claim and justify an ethnographic perspective.

Ethnography means "writing about people":

> The distinctive features revolve around the notions of people as meaning-makers, around an emphasis on understanding how people interpret their worlds, and the need to understand the particular cultural worlds in which people live and which they both construct and utilize. (Hustler 2005, p. 16; emphasis as in original)

Central to this perspective then is an interpretive approach to meaning, a sense that the world is always shaped and understood through deeply cultural understandings. After much criticism of the notion of "culture" within anthropology as a reified set of structures or institutions (Shore 2002), it is tempting to be at least wary of the term. Heath and Street (2008) suggest that in ethnographic study culture is always a dynamic process and so the noun form should be avoided.

An ethnographic perspective is in its nature concerned with cultural subjectivities in two ways. Firstly, it is concerned with the multiple perspectives of people as they interact with each other and in their environments, appreciating their points of view are diverse and constantly shifting whether slightly or in more broad swings. Secondly it is reflexive in appreciating that the investigator's perspective is always deeply personal. I need to bring out some issues with respect to the representation of changing multiple perspectives, before turning more specifically to my aims concerning literacy practices.

Twining and Footring's preceding chapter is a skilful combination of a "global" overview of the project with some interweavings of specific interchanges and of reflections from specific participants that demonstrate both a sense of change and flux in the project as it developed and a recognition that personal perspectives themselves changed sometimes with strong affect. For example, the descriptions of "Student 2" interactions indeed prove the point that even for one of the most committed students:

> a single participant's position in relation to the Learner's Role dimension varied over time and situations, falling within each of the four quadrants within Figure 4.9. (Twining and Footring, Chapter 4 , this volume).

Thus, judgements about attitudes, learning and values need to take account that these are in flux in practice.

As explained earlier in this volume use of Schome Park was restricted to children invited to join the project, usually via their schools, with the written informed consent of their parents and schools as well as themselves, plus adult staff members of the project who were individually recruited and had their credentials checked through the Criminal Records Bureau (enhanced disclosure) or equivalent for foreign nationals. Avatars once joined could not leave the island and visit other areas of TSL nor of course Second Life™ (SL). The Schome Community was rightly vigilant to ensure that participation in the project was restricted to credentialized individuals, both students and staff, and that conduct was appropriately overseen. Anonymity of the students was preserved within the project although a securely held database with real contact details was held by a few members of core staff in the event that any concern should be raised online as to a "real world" emergency necessitating contact with an actual individual and his/her parents/guardians. (Although I had such access I never had cause to make use of it).

Since all interactions were online, virtual ethnography comes into play, "an adaptive ethnography which sets out to suit itself to the conditions in which it finds itself " Hine (2000, p. 65). A significant aspect of working with virtual ethnography (or "cyber-ethnography", e.g. Ward 1999) is the treatment of identity when this is already specifically projected as differentiated from one's physical world embodiment and as a member of a distinct, online community (Browne 2003). This ethnography follows in the footsteps of Boellstorff 's (2008) anthropological investigation of SL in that it embraces the understanding of a fully rounded cultural world existing online thus the setting for an ethnography.

In this account I make a different decision regarding the depersonalising further layering of pseudonyms adopted in the previous chapter. I understand and appreciate the decision of Twining and Footring to replace the avatar names used in the project itself by the nomenclature of "Staff 1" "Staff 2" "Student 1" "Student 2" and so forth and recognise it has certain potential advantages. Some people who participated in the project will, as they read, be unable to connect the characterisations with those to whom they are attached. (Others may be able to especially where detail is given.) However, there was a cost to the decision. The terms used reify the statuses of the participants as either staff or student by putting those elements of identities to the forefront, at the cost of any other aspect of the avatar's characterisation. Arguably such a decision in itself retrospectively nullifies "the ethos we were trying to create, where staff and students were seen as equal. . ." (Twining and Footring, p. 103 above). Therefore in this chapter I take a different decision, with its own costs and benefits, and reproduce the names used in the project; of course we all gave our informed consent to the further reproduction of these pseudonyms in research dissemination.

An ethnographic perspective is reflexive, acknowledging that the cultural frames and experiences of the interpreter are dynamic themselves. In this chapter I seek to acknowledge that as a participant in the project my own viewpoint was constantly changing, although not privileged in comparison to anyone else's, and that it

continues to change as I develop my analytical work. This research process is ongoing; indeed I see it still as at a comparatively early stage in many ways, as I shall explain further below. Furthermore, an ethnographer recognises that the "cultural worlds" we are studying continue both when we are observing and when we are not there; this has particular resonance for me in that almost all of the time the SPP was open 24 hours a day 7 days a week; even during the brief downtimes the forum was available and much utilized as well as the other communicative domains of the project (see below). Accordingly before turning to the central focus of this chapter it is relevant to outline my own view of the project concerned.

In February 2007 I joined the SPP shortly after it opened its first island for teenagers. Many people joined the Schome community around this time or indeed later, and did not necessarily share the knowledge of its history and ambitions as described in the previous chapter. I acknowledge that I only gradually became aware that for some of its members its aim was to replace formal schooling.

In 2007–2008 I described the Schome Community in the following terms:

> The Schome Community, led by Peter Twining of the Open University was already active as an essentially voluntary organisation, albeit under university auspices of a wide range of people interested in what might loosely be termed alternative models of education. A group of people that includes academics, parents, young people, policy makers, educators, and other interested parties, the Schome Community was established with the aim of creating "a new form of educational system designed to overcome the problems associated with current education systems in order to meet the needs of society and individuals in the 21st century", (Sheehy et al. forthcoming). See the schome community website http://www.schome.ac.uk/ for further information. This virtual community has consistently enacted a view that genuine participation by learners must be instantiated at all stages of planning and operationalizing education. Technology is seen not only as a tool to support and extend existing practices but also as having the potential to transform ways of representing the world and of supporting learning. (Gillen and The Schome Community 2008)

Sharing this perspective, with particular interest in new literacies (Tusting 2008; and see discussion below), I was attracted by the Schome Community's decision to explore the potential of virtual worlds, considering their capacity to act as spaces in which visions of future practices and pedagogies can be built and experienced, making it "possible to construct, investigate and interrogate hypothetical worlds" (Squire 2006, p. 19).

5.2 Towards a Virtual Literacy Ethnography

My interest in Schome Park is then in examining the new literacy practices of this environment – asking such questions as:

1. What reading and writing practices are going on here?
2. What is new (if anything) about literacy in this environment?
3. What evidence is there of learning, and for creativity fostered by this environment?

By "this environment" I mean the SPP, i.e. not merely the technological affordances although of course these are materially significant but also the cultural practices of the community.

My answers to these questions are here only of course partial and illustrative. First I will explain that the inworld interactions in fact pose considerable literacy demands. Secondly I will present some literacy activities connected with a traditionally valued literacy practice, lexicography, as illustrative both of creativity within the SPP and of my methods.

5.3 The Literacy Practices of Interactions Inworld

It is impossible to reproduce in anything like a transparent form interactions inworld and much less to do so in a book format. Of course, we are faced with problems of representation if endeavouring to record anything of "real life"; perhaps the closest we might approach capturing the interactions of everyday life might be with a video camera; yet this is highly selective, partial, reductionist and involves many problematic issues in viewing and interpreting (Hancock et al. in press).

Capturing moving visual records through a single "camera" view is possible in SL (although "freely" only in ten second bursts) but this does not capture everything the viewer can see on a screen and nor is any contemporaneous audio recorded. Nevertheless this artistic practice, known as machinima, is done and is extremely exciting in its own right – see e.g. Carr 2007; Pollmuller et al. 2008 on the machinima work led by Pollmuller in the SPP.

Machinima, then, is anything but transparent in reproducing everyday interactions using the SL interface, but still more opaque must be the capturing of a still image such as I can reproduce here. Nevertheless, such an illustration can be referred to in order to discuss some aspects of the literacy demands of SPP inworld interactions. Figure 5.1 then is a screenshot i.e. copy of my PC screen taken to show some features of a typical view such as I see when inworld.

Fig. 5.1 A screenshot of Second Life

The tabs that surround the scene all have menus and submenus and thus entail considerable reading work, not least in deciding what is relevant or might be helpful at any given time. Engaging with (Teen) SL is a literacy activity, as are massively multiplayer online games (Steinkuehler 2007). At the centre of the image is the avatar through which I was represented inworld at the end of the project, Rowan. Rowan is standing in a corner of the steam museum which has been built very recently by an avatar called Steam. It is about to be the site of a "murder mystery" event. Posters on the wall made and imported by Steam show photographic images of the "real" steam engines and given historical information about them. Steam has made the two artificial steam engines visible as 3-D objects inworld, one emits authentic steaming sounds.

I am not going to describe all the functionality hidden behind the tabs, menus and submenus; these can best be encountered through learning to use SL and/or reading a popular guide. However, I will mention a couple deployed at the time of capturing Fig. 5.1. At the top right of the image I have opened a map that indicates where "I" am on the island and where other people are. At the bottom right I have opened my inventory which includes notecards – written texts that I have been given and decided to keep about events, instructions and so forth. Most of these have been written by students. At the bottom left is an open white box with text inside, this is the main "chat" window through which I can communicate synchronously with anybody close enough to see. I can also open up a further box for private conversations and for leaving messages for those not inworld at present. There are many links inworld to webpages and the other communication tools of the project. The Schome Park interface is multimodal in the sense that Gee (2003, p. 210) writes is characteristic of "new literacies" – "meaning and knowledge are built up through various modalities (images, texts, symbols, interactions, abstract design, sound etc) not just words".

This image has been kept simple in that Rowan is alone; if there were another avatar present and visible, the whole scene would appear to the second person from their avatar's/camera's perspective and their screen would also differ according to which tools and functionalities they were dealing with at that particular moment. Here we see "radically changing forms and functions of texts, which go beyond traditional conceptions of what literacy is and has been" (Kress 2005, p. 1).

As a researcher, Rowan displays a message saying "logging chat" above her head, combating "the illusion of privacy in cyberspace" (Frankel and Siang 1999). I intend to remind Rowan's interactants that at all times she is preserving written records of any interactions she is involved with, or reads in her immediate vicinity. Avatars present in her environment may have private conversations through the messaging system she is not privy to, and all communications made when staff are not present, i.e. the majority, are not recorded.

An element of my ongoing analysis work connected with the SPP which I see as very much contributing to the toolbox of a virtual literacy ethnography is to apply corpus linguistics techniques to the vast quantities of data thus collected, as well of course as discourse analysis to the more study of single interactions. Some indications of the potentiality of corpus linguistics to contribute to such analysis is

indicated by the pilot reporting (Gillen 2009). In this chapter however I begin with other domains, where indeed the lexicography activity emerged.

5.4 The SPP Dictionary

The SPP was designed to explore the potential of virtual worlds yet central to the project from the beginning were other communicative media, in particular the asynchronous forum and the wiki. (Other project communication tools such as blogs, dynamic profiles, etc are beyond the scope of this chapter.) Activity around the creation of a SPP dictionary is a fascinating example of a literacy practice that was not essentially centred on inworld interactions, although clearly with relationships to them.

The Schome Park forum was the most constantly used means of communication in the project. Access to it was simpler and quicker than going inworld since it could be accessed through any internet browser and therefore project participants could readily log on through any computer whereas to go inworld they required of course one with the required application loaded. Areas of the forum were (and are to date) accessible to the public for general discussions about education, introductions to the Schome initiative etc.) but during the SPP most of the site was accessed by members – students and staff – through logging on and participating including in the more private project areas. Postings were persistent, although some threads are archived periodically; the forum was monitored by staff; some threads by students also. The forum was used to collaboratively plan events, discuss happenings within the project, its interactions with the wider world and so on. There were also self-contained forum games and discussions on diverse topics such as archaeology, video production, consciousness, school dinners and so on, to mention just a few of the topics I was involved with.

Some topics are related to the community life of Schome Park, yet without any intention to directly link to inworld events. Figure 5.2 below shows such a posting by a student, Trixiee, initiating a new "thread" (topic; subset of the forum).

It can be seen then that, as part of the flow of everyday and generally unremarked activity in Schome Park (and thus very appropriate to selection of ethnographic data) Trixiee proposed the idea of a Schome Park dictionary, a kind of glossary. From the outset this was designed to be both the source of genuinely useful information (to newcomers for example) and also function as a space for ingroup humour. Trixiee has worked carefully on the format of her dictionary, reflecting knowledge of appropriate generic conventions. Every headword is distinguished by emphasis, followed by an indication of its grammatical status and then a definition. One entry has related words, almost as the lemmas of a lexicographer, in brackets; another, also in similar style, gently caricatured perhaps, has a cross reference. Trixiee's work here is on the boundary of Schome Park activity, not directly related to inworld activity. It is, to me, a fascinating, yet not untypical, instance of a new playful genre taking advantage of the affordances and constraints of Schome Park. She is here, a "cognitive bricoleur . . . [one of] the opportunistic assemblers of functional systems

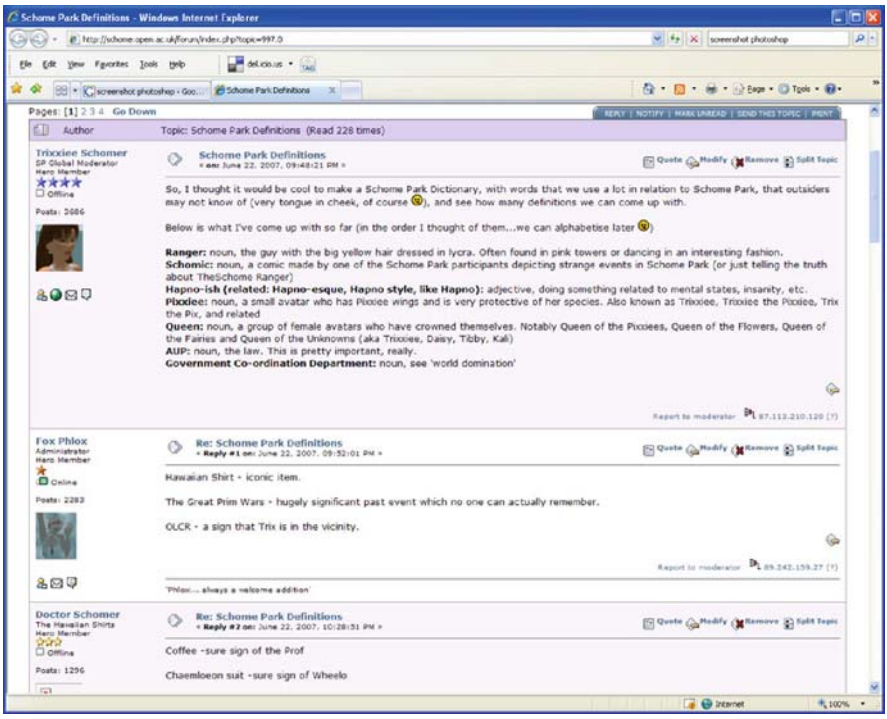

Fig. 5.2 Schome forum posts

composed of internal and external structures" (Hutchins 1995, p. 172). The external structure she uses so effectively here is the forum, in part through her internalised sense of the structure of a dictionary.

It is highly significant to note that Trixxiee is a student, a teenager. In this environment it is a student who has taken the initiative to work carefully on her own idea and then present her suggestion to the community. I am currently undertaking research on the development of digital literacies in schools, which for ethical reasons I am unable to refer to here specifically. However I cannot resist in passing making a contrast between some classrooms where undeniably fascinating work is going on, yet where the working assumption, however challenging the consequences occasionally, is that new curriculum topics are launched by teachers only, and that the teacher dictates the format of the activity and techniques to be used. Within constraints, pupils can sometimes be seen to then operate in interesting ways. Of course a passing observation of that kind can have no true validity but I can at least record it as a feature of my own experience as a classroom researcher of digital literacies. Certainly some commentators have pointed to the challenges of "Web 2.0" or interactive uses of the internet as posing fundamental questions of prevalent assumptions in education as to the location of expertise and possibilities for more participatory approaches to education (e.g. Selwyn 2008).

In contrast, this technically innovative environment was a factor in the emergence of the project ethos as characterised by "fluid leadership" (see Peachey et al. 2008). As we have argued elsewhere, this however is not a characteristic determined by the technology but an aspect of the project as it was developed by participants creatively making use of the environment's affordances. Taking the regattas referred to in the previous chapter as an example, we demonstrated how modelling participatory modes of leading new initiatives in the project became effective. Owing to the constant attention devoted by staff members to setting out a genuinely welcoming, tolerant and constructive ethos from the beginning (while not denying that of course occasional mistakes were made) the modes of invitations, facilitative suggestions for developing a good initial proposal, encouragements and so forth were then appropriated by at least some of the students some of the time. There are many instances of mirroring not just the import of encouragement, but even more closely the discursive formulations within which the staff couched their turns. Such mirroring happened the other way round too, as in this example.

Here we see responsiveness to Trixxiee's initiative, that, given the 24/7 multimodal coverage of the project could be seen as outstanding, but was not actually exceptional in the everyday life of the project. Within 4 minutes Fox, a staff member, has constructed a reply to Trixxiee that takes up her suggestion in the best possible way: not merely offering positive feedback but engaging with it seriously and creatively. Fox offers three definitions that are simultaneously community-building, referring to particularly familiar artefacts as in her first example, and are also imaginative. Her mock-historical suggestion of "The Great Prim Wars" serves to offer the kind of founding myth that a human society constructs around its origins; its formulation makes reference simultaneously to knowledge of a Classical past (references to Ancient Greece and Rome were not uncommon in the project) and the twenty-first century Second Life-specific jargon "prim". Her third definition is gently flattering to Trixxiee, bringing in a reference to her activities. In a little more than half an hour later a student felt encouraged to contribute his own suggestions, which particularly pick up on Fox's last idea and the initiative was running.

Almost exactly 24 hours after the first posting, both Trixiee the originator and another student, Marsbar9, started simultaneously creating and authoring a new page on the wiki where the dictionary could reside. A wiki is a relatively appropriate place for the construction of a literacy artefact that is intended to remain as a persistent record, yet to be open to modification throughout as opposed to additively as with a forum thread. Figure 5.3 shows the initial wiki page as it stood, after considerable collaborative activity, as captured several months later. Before undertaking some analysis of the central content of this page it could be useful to remark on two aspects of functionality.

Wiki pages vary in format a great deal although the menu to the left and the tags at the top remain essentially consistent throughout. It is beyond the scope of this chapter to explain all the menu features and tags but it will be useful to mention two of the tags. If you click "edit" at the top, and you are a member of the project, you will have the opportunity to edit any part of this page, preview your amendment and then save it so that anyone visiting the webpage will see the new version. The "history" tag

Fig. 5.3 The Schome Wiki

would lead you to an automatically recorded account of who has made changes to which section and when. If you have moderating responsibilities and are concerned about any particular new element of text, then you can find out who was responsible.

Figure 5.3 as already mentioned shows the dynamically produced wiki that Trixiee and Marsbar9 began. This page is publicly available for viewing, one of over such 800 content pages. Undoubtedly it could bear the weight of considerable analysis, including attention to its multimodality, including colour, and through bringing in background knowledge about the content that has been gained through participant observation in the community. However, I think it is most useful here to make a few points about the wiki page as a collaborative authoring activity:

The page has a clear header, an initial description that would be accessible to all (i.e. whether seeing this page for the first time, or more familiar with it) and a brief sentence proclaiming its collaborative authorship through the means of welcoming more contributions. The second paragraph relates to the constantly developing convergence of technologies in the project and requires some knowledge of (Teen) SL to understand. The references to inworld and scripts indicate that there is an endeavour to make this into an accessible resource that one can view through one's avatar (i.e. rather than also having to open a webpage); apparently this (ambitious) endeavour has met with partial success. However, again, this is clearly part of a collaborative activity with an implied invitation to join in if your motivation and skills are appropriate.

The contents box makes use of the hypermedia functionality or multiple routes of navigation possible on the world wide web; one can use this "window" to quickly find the word you seek, or alternatively close it if you wish to browse down the whole list. The dictionary entries would rarely be helpful in practice to new entrants to the project and I would suggest that the evidence of the forum thread initiation suggests that they were not designed with this as a true priority.

The entries themselves demonstrate their authors to be meaning-makers in a deeply cultural world. AUP is the "acceptable use policy" which is drawn to the attention of all newcomers so actually the entry is more a comment on its status (somewhat tongue in cheek) rather than a "definition." Similarly the other entries feature in-group humour, with only chatbot beginning with an actual definition. Some moves towards a pleasing symmetry of form have been made; the bubble suit or "sign" of Wheelo's presence (for this was an avatar who very skilfully made his outfit change colour to match the colour that a nearby avatar "spoke") is here as a significant feature indeed of the environment; the entry is in a format parallel to the lexicographical structuring initiated by Trixxiee in the first place.

The dictionary then is part of the Schome Community's discourse; as Lankshear and Knobel (2006) write, drawing on work by Gee:

> . . .literacies are always about much more, and involve much more, than just the production of texts. They are (also) contexts or pretexts for enacting and refining memberships of Discourses that include such dimensions as feeding back, providing support, sharing knowledge and expertise, explaining rules, sharing jokes . . . enacting an affinity. (Lankshear and Knobel 2006, pp. 71–72)

To my considerable surprise "feeding back" was also evident to a strong degree when I made the investigation of the history of the wiki page (Fig. 5.3). Figure 5.4 shows an extract relating to the construction of the "Schome Park dictionary" from the period 23–24 June (captured 17 April 2008). Unlike the 800+ content pages of the wiki, the history page from which this extract comes is one of over 3,500 other pages which will have been automatically generated. I would expect it to be relatively rare that anyone would click onto the "history" tab of any page. In fact from my experience of the project and knowledge of its now vast resources, I would not expect it to happen unless someone had a very strong proprietorial sense or, in their role of moderator, had something brought to their attention perhaps by someone else, as a matter of concern.

I was astonished to find that several participants had bothered at the same time as making a change to the wiki page to include some summary, reflective remarks ("meta" comments as it were) that then appeared only on the automatically

- (cur) (last) ○ ○ 21:26, 23 June 2007 Decimus Schomer *(Added a couple of entries)*
- (cur) (last) ○ ○ 21:11, 23 June 2007 Decimus Schomer **m** *(Rearranged a small amount of formatting so that dictionary compiler can understand it better)*
- (cur) (last) ○ ○ 21:08, 23 June 2007 Trixxiee Schomer *(→S-T-U - added SPD and Schome Park Dictionary)*
- (cur) (last) ○ ○ 20:58, 23 June 2007 Decimus Schomer **m** *(Updated Numerius' entry)*
- (cur) (last) ○ ○ 20:55, 23 June 2007 Numerius Schomer *(→J-K-L)*
- (cur) (last) ○ ○ 20:54, 23 June 2007 Numerius Schomer *(→M-N-O)*
- (cur) (last) ○ ○ 20:54, 23 June 2007 Numerius Schomer *(→M-N-O)*
- (cur) (last) ○ ○ 20:53, 23 June 2007 Numerius Schomer *(→M-N-O)*
- (cur) (last) ○ ○ 17:45, 23 June 2007 Trixxiee Schomer *(→A-B-C - addition: chatbot)*
- (cur) (last) ○ ○ 17:14, 23 June 2007 Trixxiee Schomer **m** *(→V-W-X)*
- (cur) (last) ○ ○ 17:13, 23 June 2007 Trixxiee Schomer *(and some more)*
- (cur) (last) ○ ○ 17:03, 23 June 2007 Trixxiee Schomer *(more entries)*
- (cur) (last) ○ ○ 14:30, 23 June 2007 Professor Schomer **m** *(→A-B-C)*
- (cur) (last) ○ ○ 14:09, 23 June 2007 TibbyFairy Schomer *(→A-B-C)*
- (cur) (last) ○ ○ 14:01, 23 June 2007 Trixxiee Schomer **m** *(→S-T-U)*
- (cur) (last) ○ ○ 14:01, 23 June 2007 Trixxiee Schomer **m** *(→S-T-U)*
- (cur) (last) ○ ○ 14:00, 23 June 2007 Professor Schomer *(added defs for 'SPii', 'sumo', 'volcano sumo' and 'Xtapolapocetl')*

Fig. 5.4 Tracking Wiki edits

preserved history page enhancing the quality of information available to anyone who does wish to trace the changes. Examining Fig. 5.4 closely one can see for example that the entries relating to Numerius Schomer have been recorded wholly automatically and therefore show that s/he made changes without additional reflective comments. However it is clear that many other entries have had notes appended: these are the italicised words in brackets. These are wholly "backstage" to the public face of the project.

Decimus, Trixiee and Professor have chosen to explain some of their actions here. If they have improved formatting or in some small way improved others' entries, they have chosen to record this or indicated in some other way their own initiation. Such a practice may possibly be drawn from the collaborative editing of Wikipedia that enables conflicts and consensuses alike to be traceable. Myers (2007) has argued that the mass media diatribes against Wikipedia as not necessarily "accurate" are missing the point of its usefulness; that its particular innovatory value as a reference work lies in its preservation of the traces of its dialogic disputation of contested realities. What I find surprising here is the attention some of the Schomers are paying to the system's backroom: additional expenditure of effort in writing indicates conscientiousness in a context that will almost certainly attract few or even no readers. It does however have the potential to be communicatively informative beyond what the automatic system provides, thus perhaps courteous to anyone who wonders why something they did has been subsequently changed and of interest to anyone who does want to follow the evolution of the page in detail, whatever their reason.

A sample of chatlog data from the project was subsequently searched for mentions of dictionary. The results cannot be representative of the inworld data as a whole since the sample is of a very small part. However, the search showed that the lexeme dictionary was part of the SPP discourse. For example during a highly technical discussion of an investigation of Linden Lab code, one student likened his slow but methodical approach to that of a dictionary. Twice members of staff referred to having a dictionary at hand; once Fox provided a definition pertinent to a discussion of the elements comprising a Roman pavement from the Oxford English Dictionary. The SPP dictionary itself was referred to, e.g. one student quoted a description of a staff member from it in contributing to a discussion about a choice of illustrative images. Another used the word to stand in for someone's personal vocabulary; after "dodecagonal" [sic] was proposed, seemingly as an adjectival form of dodecahedron, Faz replied, "lol:P I don't think that word is in some peoples dictionary". Possibly this may reflect semantic confusion or it might in some measure at least reflect a subtle understanding as to dictionaries' inevitable subjectivities.

5.5 Conclusions

"New literacy practices" or "new literacies" is a concept mostly but not entirely mappable onto contemporary digital technologies and the methodologies with which these are studied. As Lankshear and Knobel (2006) discuss, contemporary

digital technologies are associated with new blends of semiotic resources, especially presented online. But what is crucial about the so-called "post-typographic" era is not only affordances of digital technologies, but associated new opportunities for collaborative meaning-making, rapid dialogues in diverse formats and potentialities for communicating across what previously might have acted as obstacles to access, such as those related to time, space and aspects of embodiment including dis/abilities in the physical world. Concepts such as Web 2.0 and digital literacies capture aspects of these relationships between social practices and involved technologies (see Anderson 2007; Merchant 2007; Gillen and Barton 2009 for overviews). Lankshear and Knobel (2006) put their theoretical emphasis above all on the practices involved; this sensitivity dovetails well with the perspective known as New Literacy Studies (NLS) or Literacy Studies that has developed since the 1980s (e.g. Heath 1983; Street 1984; Barton and Hamilton 1998; etc). NLS remains relevant as a springboard to understandings of literacy in its focus on the situated character of functions of literacy, recognising the diverse purposes and understandings with which people deploy their own blends of skills in the production and uses of texts. Literacy skills then are not best understood as an abstract concept but always as related to how situations are inhabited by people who act in way shaped by a myriad constellation of factors including their previous experiences, access to social and cultural resources etc.

Glimpsing the work of Trixiee on the forum or Steam's artefacts in his museum is a brief introduction to the rich diversity of the activities and experiences of the students in Schome Park. This diversity mirrors the results of the investigations by Green and Hannon (2007) who urge that a common understanding presented in the media of young people as uniformly competent in new technologies be made more complex. They identified different "user types" as: digital pioneers, creative producers, everyday communicators and information gatherers. This project echoes that finding in its identification of a variety of activities and skill sets developed that are less usefully occluded in any singular term.

Participating in Schome Park is a hugely literate activity. New literacy practices demand attention to all features of a text, moving beyond the linguistic to a semiotic disposition (Kress 2005). People involved operate often simultaneously with a multiplicity of semiotic resources that have to be deployed in combinations that are patterned in ways to make sense to fellow interactants. Furthermore, it is not (only!) that there is a new complexity of channels and resources, but it is also evident that there is a new intricacy to the choreography of collaborative authoring and feedback in the cycles of text production and reception that come together so rapidly as to be near-simultaneous: "the roles of readers and writers overlap." (Merchant 2007, p. 122).

In the complexity of the communicative tools and the relations between them, literacy practices involve cultural knowledge, the employment of artifacts and representations of the world. They are thus precisely in Hutchins' (1995, p. 168) terms part of a "cognitive ecology in which the various representational technologies constitute one another's functional environments."

Considering the diverse functionalities of the communicative domains, their affordances and limitations, is an essential component of endeavours to understanding the cognitive processes and thus learning taking place in the SPP. Writing of the "actual world" Leontiev (1978, p. 13) proposed:

> Cognition does not exist outside the life process that in its very nature is a material, practical process. The reflection of reality arises and develops in the process of the development of real ties of cognitive people with the human world surrounding them; it is defined by these ties and, in its turn, has an effect on their development.

SPP with its interaction through non-corporeal avatars with curious names and highly technologised means of communication is far removed from what some of us might at first sight consider invoked through the phrase, "human world." However I would contend that it is a deeply cultural, human world, that can be approached through an interpretive, ethnographic stance. Ethnography in such contexts is itself shifting, emphasising techne as much as ethos (Boellstorff 2008; Vannini 2009). Tracing communicative actions and the ways in which they are taken up and responded to, is an investigative enterprise that requires detailed consideration of subtle differences in the affordances of media.

> . . . deemphasizing traditional ethnographic concerns with the values "hiding" behind actions, the mind underlying embodied interaction with objects, the discourses surrounding action, the teleological purposes butteressing technology, and the symbolism overriding iconic and indexical meaning might allow us to recenter ethnographic methodology in a way that is more consonant with the subject matter of material and technoculture research. (Vannini 2009, p. 6)

A virtual literacy ethnography is a response to the call for an ethnography of activities in a virtual world and its associated domains that focuses upon the communicative activities. Undoubtedly its methodology needs to evolve further in order to reveal more of the dynamics of such a rich project.

This chapter offered a brief sketch of some of the ways in which this project, so exciting to be involved in, might be considered to encapsulate some of the potentials of the impact of new global technologies. Evidence presented and discussed in this chapter combats the "consistently negative representation of young people's new-media language" (Thurlow 2007, p. 214). My experience of the project suggests that we can claim this experience of a well-designed and responsibly managed educational project in a 3D world to be part of a "new communications landscape" (Kress 1998).

Acknowledgments Although this chapter makes use of my first person perspective, it is deeply embedded in the collective experience of the Schome Community. Peter Twining was the project director. Other staff members who have particularly contributed to my understanding include Oliver Butters, Gill Clough, Rebecca Ferguson, Shri Footring, Mark Gaved, Ronald Macintyre, Anna Peachey, Dan Seamans, Kieron Sheehy, Becca Wilson and the much-missed Jacquie Bennett. This project has received support from funders including the Innovations Unit, NAGTY (National Academy of Gifted and Talented Youth), Becta and the Open University.

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Chapter 6
The Third Place in Second Life: Real Life Community in a Virtual World

Anna Peachey

Abstract In June 2006 The Open University (OU) purchased its first land in Second Life™ (SL). Over a two and a half year period, the OU presence evolved and grew to a point where an average of between 150 and 250 unique users in any 7-day period are active in an OU area. This chapter charts the history of the development of the OU Second Life social community and considers the nature of that activity at a point of critical change, in January 2009, shortly before a new island is developed to provide a permanent home for the community. In order for the community to continue evolving it is necessary to understand the nature of the core activities of these users, and to consider this in a context of sustainable development. Through reference to aspects of socialisation and physical community, the author proposes that a virtual world environment can be described using the physical world concept of a Third Place in the information age, and considers the value of virtual space to a learning community. From a perspective of ethnography, this chapter captures a community development within SL and proposes that physical world concepts of community and Third Place are exhibited in a virtual world, and that there are equivalent benefits in the sense of support and belonging to a virtual world community.

6.1 Introduction

Felix (2005) states that 3rd Millennial education institutions uphold six distinct learning expectations:

- Flexibility
- Inclusiveness
- Collaboration
- Authenticity
- Relevance, and
- Extended institutional boundaries

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Virtual world activity is extremely flexible. It is generally inclusive and where it is not, for example to those with restricted sight or with hardware or broadband limitations, efforts are ongoing to remove barriers (for the former see White et al. 2008 and, for the latter, Peachey and Yanacopulos 2008). Embedding learning in a practical and authentic context that links activity and discussion exploits the value of community of practice to build shared repositories and collaborative learning. Not only is it relevant to adopt these environments for education, it is also logical: Students are likely to be confident in an environment that is linked to those in which they spend significant periods of leisure time, and working in this milieu places them in Vygotsky's zone of proximal development, a prerequisite motivator for constructivist learning. The Open University (OU), very much a 3rd Millenial institution, has extended its institutional boundaries into Second Life™ (SL) and may yet go further into world or worlds unknown.

This chapter outlines the development of the OU Second Life community over a two-year period and demonstrates how it maps to the physical world location-driven community concept of Third Place, as defined by the urban sociologist Ray Oldenburg (1991). In the field of community building, Third Place is used to describe a social environment that is distinct from the first and second place norms of home and workplace, for example a regularly frequented coffee shop. Oldenburg argues that a Third Place, ". . . hosts the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work" and is necessary for civil society, democracy, civic engagement and establishing an authentic sense of place within a community. Through observing and interpreting the student-driven behaviour of the social community we gain an understanding of how users engage in and with the environment, providing valuable insight for input into long term strategy in creating a community of learners for the OU in virtual worlds. The chapter considers the background and context to the development of the OU *social* community in SL and explores community building in general terms before proposing the Third Place as an appropriate model. The chapter concludes by looking forward to the possible future for this community.

6.1.1 Locations and Activities

Table 6.1, below, clarifies the locations, characterisations and relationships between the various spaces mentioned in this chapter.

6.2 Cetlment Island: Background and Context

6.2.1 Experimental Spaces

In June 2006 Cetlment Island (see Fig. 6.1: Cetlment Island) was a pilot project in SL housed within the Centre for Open Learning in Math's, Science, Computing and

Table 6.1 Reference for islands and activities

Date	SL location	Overall characterisation	Participants	Activities	Parallel related developments
2006	Cetlment island	OU Pilot and exploratory project (Centre for Open Learning in Maths, Science, Computing and Technology)	Self selecting OU tutor groups	Tutorials/Open experimentation with space	SchomeBase – Schome project: OU plus people from other places specifically working on Schome Initiative
2007	Cetlment island	As above	As above	Evaluation – finds good contribution to retention including through social elements of interaction (immediate desire for residential presence)	SchomeBase devotes attention to planning and then setting up Teen Second Life project: Schome Park programme
Feb 2008	Open Life opens for initial building	OU course teams begin to explore	Some existing and new OU students and staff– still small numbers, occasional	Various buildings, spaces and events, both tutorial focussed and more purely social	SPP – main focus of limited SchomeBase activity
May 2008	Open Life "take off"	Promotion of Open Life; significant new entrants, Sholokhov Halls take off	Hundreds of OU students and staff make at least 1 visit	Sholokhov Halls community development. Tutorials and course events inworld.	SPP – main focus of limited SchomeBase activity

Table 6.1 (continued)

Date	SL location	Overall characterisation	Participants	Activities	Parallel related developments
July 2008 – December 2008	Open Life community spreads over Open Life island and Schomebase	Open Life on Open Life island = tutorials. Social community on Schomebase = (expanded) Sholokhov Halls	Hundreds of OU staff and students on each island	Diverse range of activities including tutorial groups; curriculum-related (but broader than single tutorial groups) SL skills development; social gatherings e.g. discos, shared interest discussion groups, collaborative builds, invited speakers	Most Schome members focused on SPP; some involved with Open Life activities (author of this paper and colleagues key in liaison between communities as involved in both). After SPP closure lessening of activities among those Schome people not in Open Life community. In an effort to reinvigorate SchomeBase identity decision is made to relocate Sholokhov Halls
Jan 2009	Open Life across Open Life and new island	Open Life community spread across 2 islands – 1 for tutorials and 1 for the social community	Hundreds of OU staff and students regularly on each island	Continuing	SchomeBase closes

Fig. 6.1 Cetlment island

Technology (COLMSCT), a Centre of Excellence in Teaching and Learning (CETL) at the OU. The original project was owned by Jacquie Bennett and I joined her as co-researcher in October that year, leading the project after Jacquie's death in September 2007. A second OU island at the end of 2006, SchomeBase, provided a main grid presence for the Schome project, which exists to explore and challenge traditional instructional models and pedagogic practices (see Chapter 4 by Twining and Footring, this volume; Chapter 5 by Gillen, this volume). In the early stages of their existence both islands were experimental spaces, working on a small scale, where any user could generate objects and contribute to the island development. Students were welcome to visit, and formal tutorials were run and evaluated on Cetlment (see Bennett and Peachey 2007), but in order to contain the project there was no formal promotion of these sessions, resulting in little regular activity or casual social interaction on either island aside from during organised events. An OU UK group was inaugurated inworld as a social focus for staff, but without a critical mass of users activity dwindled to nothing over the course of a few months.

By 2007, evidence of participation and retention rates from the pilot studies on Cetlment was encouraging, and the university was keen to build on this work by expanding access to more students. For the previous few months the Schome project had been focusing much of its attention in the Schome wiki, forums, and on their island in the teen grid. The decision was made to buy a new island, funded by the COLMSCT CETL as a research space, and site it next to SchomeBase with a development plan to landscape the two islands together as complementary spaces. Open Life was delivered in February 2008, replacing Cetlment as the OU SL presence.

6.2.2 Island Design

With little indication of the scale of future take up for the islands, it was decided to create spaces that were simply as appealing and flexible as possible within the context of the environment. The COLMSCT and Schome projects would continue, and more staff and students would be invited to visit the islands and by their presence, input and feedback to guide further development of both form and function for the University's presence inworld.

An informal survey of friends and colleagues among the inworld learning community provided a number of key points for consideration in designing attractive SL spaces, for example:

- Ambient sounds, as long as they are not too intrusive, add richness and depth.
- Places that reflect physical world nature, with lots of green, are seen as welcoming and physical world connections generally help visitors feel grounded and safe.
- The island should not reveal itself all at once, for example by being completely flat.
- Paths that link key spaces will encourage visitors to explore.
- Finding small things to surprise and delight will encourage visitors to return.

The overwhelming majority of users surveyed were enthusiastic about spaces that reflected the physical world rather than fantasy, and all agreed that this was especially important in supporting those making the transition from "newbie" to SL resident. The notion of having green spaces also worked with the unknown future of the island as, just like in the physical world, these spaces could potentially be flattened and built on should the need arise.

6.2.3 Virtual Residence

An incidental observation from the Cetlment research period was the number of first time visitors who immediately wanted to create a virtual residence. Unless you wish to exhibit for example art, information or items for sale, there is no need to own property in SL, as all your belongings can be held in inventory until needed. Hunter Walk, a founding team member at Linden Lab, is quoted by Au (2008, p. 57):

> Where one might expect airborne societies of people frolicking in the clouds, the overwhelming majority of Residents insist on remaining earthbound for most of their time. When SL launched, Walk watched, perplexed, as the early users steadfastly kept themselves on the ground. 'They immediately started building – homes! And not even fantastic, otherworldly homes, but realistic houses for the most part, fully appointed McMansions with utilities of no conceivable necessity. ("Why would you build bathrooms and dining rooms?") But that kind of artificial realism was the preference of the majority (and still is)'.

Boellstorff (2008), an anthropologist who spent some time immersed in SL agrees that "placemaking is absolutely foundational to virtual worlds". In recognition of this, and in order to explore it further, it was decided to provide a small

number of residences on the new island. These buildings would be available for free rent to any member of staff or students for a period of 6 weeks, after which time they would be required to vacate if there was a waiting list. The assumption was made that after this time a resident would either wish to settle down in a higher quality, paid-for apartment elsewhere inworld, would be happy to exist without walls or would have left Second Life altogether. The resulting twenty-four Sholokhov Halls apartments, named for Jacquie Bennett's avatar, were located on Open Life and built to face into a central quad, with communal seating and a virtual coffee machine. The area was landscaped and a poster was placed in the quad to explain the purpose of the Halls and to provide a note card with information for prospective residents.

6.2.4 Living in Halls

The new development of Open Life and SchomeBase opened to a 2 day technology course event in May, publicised in the relevant course forum. Around 50 staff and students visited over that period, with five taking up residence at the Halls. In the following week an announcement was posted to both staff and student web portals. Over the subsequent 7 days on the islands there were over 400 unique visitors, the Halls were filled with a mix of 17 students and 7 staff, and a waiting list was established.

Most residents were quick to decorate their apartments – those who didn't do it straight away never really progressed beyond putting out one or two small objects and were not active in the subsequent community – and the propinquity encouraged communication between those who found themselves inworld at the same time. At the end of the first week at full occupancy there was an impromptu housewarming party, with a small dancefloor and a streamed music radio station. All the residents dressed their avatars in party finery for the occasion and used dance, food and drink animations to ground the activity in physical world metaphor. The OU SL group was resurrected, both staff and students were encouraged to join and membership increased rapidly. The group was used to organize inworld outings and social events and, occasionally, to issue notices about island matters, for example to remind everyone of the user policy for the OU space (see Fig. 6.2).

There was also a short set of rules for the tenants at the Halls (see Fig. 6.3):

There was only one significant breach of the Halls rules, when a resident exceeded the prim limit in their apartment by over 400 prims (Second Life building blocks). This is an important issue as any island has a restriction of 15,000 prims and the limit can be reached remarkably quickly if building is unchecked. A high number of prims can also lead to lag for anyone on a slow broadband connection and/or old machine. In the first instance the majority of the residents' objects were returned to him and he received a friendly reminder of the necessity in keeping prim limit down. He protested that he hadn't understood the need for limits, but became a repeat offender despite further warnings and, mainly due to complaints from other residents (his object often included noisy things such as daleks) eventually he forfeited his place at Halls.

Welcome to the Open University Island in Second Life. Please note that this is a PG sim for education purposes. You are welcome to visit the island, but in doing so you are agreeing to abide by the following simple rules:

- Respect the privacy of any groups using the island
- Do not communicate in any anti-social manner, including but not exclusive to discussion and/or material including illegal, offensive, commercial or promotional content
- No griefing (a term used to describe deliberately annoying behaviour of a type specific to virtual world contexts)
- No nudity
- No weapons

The Open Life team reserve the right to restrict or deny access to anyone who they consider to be in breach of these rules. If you wish to make a complaint about another user of the island, please send a notecard to Elsa Dickins including all possible identifying material and as much evidence of the problem as you can, for example a chatlog and/or screenshot.
All staff and students of the OU should also note the OU Computing Code of Conduct: http://www3.open.ac.uk/our-student-policies/pdf/studcompcode.pdf

Fig. 6.2 User policy

After just three weeks it was clear that activity at the Halls was about far more than the individual process of furnishing a space and, at any given time, a visitor to the island would be more likely than not to find at least 2 or 3 Halls residents chatting in the communal area, significantly more during evenings and weekends. The social aspect of this interaction, along with the shared background of the University, was attractive and engaging to new visitors, and the waiting list for new apartments had to be suspended due to the lack of administrative resources to deal with the subscriptions.

There was one downside to the level of social activity on the island. More tutors were beginning to use the public spaces for tutorial and teaching sessions with their students, and sometimes found themselves with an uninvited and inquisitive audience, drawn from the community socialising at the Halls. The tutors involved were kind enough to extend their sessions and include the visitors, but this was clearly not a scalable solution for the long term. After discussion with Peter Twining, the Schome Project Director, a solution was found.

6.2.5 Home Sweet Schome

The informal learning and group activities taking place on Open Life were significantly social constructivist, which mapped well to Schome ideals. In social constructivism, the focus is on interaction with people and co-construction of knowledge (Felix 2005). Social constructivist conceptions of learning assume that knowledge construction is achieved by the interaction that takes place within oneself

These buildings are available to staff and students to rent for free.

If you wish to rent, please email a.peachey@open.ac.uk from your FirstClass OU Mailbox, and include your avatar name. You will then be added to the Open Life Sholokhov Buildings group, and allocated a house.

You will only be able to create, place and edit objects in your home when your Sholokhov group is your active group. If you find that you have lost permissions, check your groups (tabbed option in 'Communicate') and click on Open Life Sholokhov Buildings then Activate.

The buildings are rent-free, enabling people to test out how it feels to be a Second Life resident. If there is a waiting list and you have had your building for more than 6 weeks, you may be asked to vacate and find a permanent home elsewhere within Second Life. We hope you will have a very positive experience in the Sholokhov Halls community, so please note the following formal but necessary notices:

- By accepting a home here, you are agreeing to abide by the following simple rules:
- Respect other residents privacy
- Preserve the general style of the area (especially if you build on your porch)
- Don't exceed a prim count of 100 in your building, so that resources on the sim are shared evenly (there is a limit on the island)
- Do not communicate in any anti-social manner
- No griefing (a term used to describe deliberately annoying behaviour of a type specific to virtual world contexts)
- This is a PG sim for education purposes - any illegal, offensive, commercial or promotional material will be removed, and you may be banned from the buildings and/or the island.
- If you do not use your building for a period longer than 4 weeks, it may be reclaimed for other users.
- If you wish to keep your space private you are welcome to create a door and hide the windows from the inside. However, remember that in Second Life there is no true privacy, as cameras can go through doors and around corners. The Open Life team reserve the right to restrict or deny access to anyone who they consider to be in breach of the group rules.
- If you wish to make a complaint about another user of the Sholokhov Halls, please send a notecard to Elsa Dickins including all possible identifying material and as much evidence of the problem as you can, for example a chatlog and/or screenshot.

All staff and students of the OU should also note the OU Computing Code of Conduct: http://www3.open.ac.uk/our-student-policies/pdf/studcompcode.pdf

That's the serious bit over - now have fun!

Fig. 6.3 Resident's policy

through reflective thinking, and by the interaction that occurs in communications and collaboration with other people (Vygotsky 1978). Students and staff were demonstrating communication and collaboration in their activities online, and developing this activity through their individual reflections. This model complemented the Schome activity to date on the teen grid, and an obvious and viable solution to the compromised use of Open Life space was to relocate the Halls to the underused land on SchomeBase.

At the end of June, residents were emailed and informed of the planned move, which then took place in early July. The new SchomeBase site was much bigger, allowing for more Halls (48 in total) and for a bigger seating area, dancefloor and meeting point for the OU group. Residents were introduced to the Schome principles, and to use of the wiki and forums for managing collaborative work.

Within 2 weeks of the move, members of the social community were posting events to the SchomeBase events page on the Schome wiki. Planned activities took place in the most context appropriate space on either of the two islands, and between them SchomeBase and Open Life hosted meetings for a literature group, a science group, a debating group, a collaborative build and one-off activities such as tutorials for building skills. One student came forward as a Second Life DJ and offered his services to provide live music for parties, for example the "Eighties night" shown in Fig. 6.4. Crucially, at this point it was made clear to everyone that the Sholokhov Halls group inworld was for admin purposes (to set land permissions for home decorating in apartments) and that the OU social community inworld was open to everyone as either a Schome or Open University group member. Five residents

Fig. 6.4 Eighties night at the Sholokhov Halls

forfeited apartments in the move, as they had not been active inworld for over 4 weeks, and three of the original residents moved out to apartments elsewhere in SL, as had been predicted. All three of these continued to be regular visitors to the space and very active members of the community.

6.3 Socialisation

With an increasing number of regular users in our SL space, the socialisation process necessary to engage with the surroundings, and with other users, emerges as relevant to any discussion of development and community.

Socialisation defines the process by which individuals develop the habits, ideas, values and attitudes through which they learn to inhabit their culture or community. A classic definition holds that (albeit for any gender) "[. . .] it prepares the individual for the roles he is to play, providing him with the necessary repertoire of habits, beliefs, and values, the appropriate patterns of emotional response and the modes of perception, the requisite skills and knowledge [. . .]" (Chinoy 1961).

Socialisation continues in adulthood as a form of contextualised learning relevant only to specific situations. Brezinka (1994) says that "Socialisation is often described using the concepts of 'learning', 'social learning', 'societally relevant learning', 'taking on', 'receiving', 'acquiring', 'assimilating', 'absorbing' or 'internalising'". Contemporary sociologists and cultural theorists have identified mass communication as a device for socialisation, and echoed the continuity of adult socialisation moulded by the changing culture in which we exist.

Marshall McLuhan, quoted in Wheeler (1998), claimed that, "The medium, or process, of our time – electric technology is reshaping and restructuring patterns of social interdependence and every aspect of our personal life. It is forcing us to reconsider and re-evaluate practically every thought, every action...". This permeation of technology into our lives pushes us into new spaces, of which SL is only one, where we must work through a period of socialisation and adjustment each time.

Users of the OU space in SL often demonstrate and/or report their awareness of this socialisation process as evidenced by the most significant project from the group, who took the initiative to establish the "nOUbie Centre", a building to house information about both Schome and the OU inworld community, and to provide support for newcomers to SL and the community. With administrative support, the group established a building, created a logo, volunteered for Buddy Boards (to provide instant inworld support to visitors) and scheduled weekly meetings to continue developing the space. Longer-term members of the group will provide a tour and history of the Halls development to anyone showing an interest. Those visitors who behave outside the norms of the local environment, for example by not wearing enough clothes or, with more subtlety, by not allowing someone else the space to express their opinion, are politely but quickly made aware of their indiscretion.

A value that can be a surprise to newcomers in the OU space is the egalitarian nature of the social community, where tutors and students have equal voice in

matters relating to the maintenance and development of the community, subject to the underlying necessary structures as already discussed. However it is frequently students who take the lead in activities and interactions. To some extent this egalitarian spirit is associated with the overall SL virtual world ethos, (see Boellstorff 2008) in that projection of identity via avatars conceals markers of status and authority of "actual life" presences. At least as significant however, is the ethos developed in OU projects, including in the Schome initiative where it is consciously recognised that students (i) may often be the ones to hold and develop expertise in specific matters quicker or more deeply than staff members; (ii) learning is an active process, so participatory modes that involve shifting leadership roles may be the most effective (see Peachey et al. 2008 for discussion of "fluid leadership" in the Schome Park project).

6.4 Community Building

6.4.1 Communities

In this chapter the collaborative social activity centred around the creation of Sholokhov Halls has already been referenced as a community – it is hard to find another word that better describes the group activity. There are numerous contemporary definitions of community that reference group characteristics rather than a location, for example the OU can be described as a learning community despite the significant geographical distribution of the individuals within it. The term community of practice (COP) (Wenger 1988) is used widely and there is some dispute as to the range of activity it encompasses, for example Jones and Preece (2006) reserve their use of the term for "those communities that typically exist in relation to companies or professional organizations," and would alternatively reference the learning community on Open Life and Schomebase as a "community of interest". Wenger asserts that a COP occurs naturally and can not be created (although Jones and Preece report some successful instances of this, for example Schlager et al 2002), so any investigation of inworld community from this perspective should recognize that bringing people together in a virtual space does not in itself constitute the creation of a COP, and that the activity that takes place there arguably does not relate to the participant's practice in the physical world. However, reflections on the teen grid phase of Schome identified the features of a learning community and specifically a modified community of practice:

> We feel that the concept of 'communities of practice' fits activity within the Schome Park project better than alternative frameworks. Lave and Wenger (1991) describe the links between learning, modifications of identity and practice in their characterisation that we have found relevant to understanding the shifting activities, developing expertise and modifications of identity. (Peachey et al. 2008).

In another paper therefore there may be convincing arguments for the main grid Schome and OU social community as a community of practice, where practice in this case is learning to learn.

In this chapter the focus on community instead centres on the unique feature of virtual co-location with a sense of three-dimensional physical presence, and considers the authenticity of the community as if co-located in physical space. This is particularly significant at a point when the community is about to be rehoused to a permanent location, purpose-built to meet its needs, and an understanding of how the virtual space impacts on the community is critical to the development.

Community Building is a process described by Peck (1988), who describes what he considers to be the most salient characteristics of a true community:

- inclusivity, commitment and consensus
- realism
- contemplation
- a safe place
- a laboratory for personal disarmament
- a group that can fight gracefully
- a group of all leaders
- a spirit

6.4.2 Roles, Identity and Communication

Over the period since the Halls were first opened there is evidence, including chat-logs, wiki and forum records and informal interviews, that the SL community has met each of these criteria, exhibiting not only commitment and consensus but also conflict, and the ability to resolve and move on from such. Understanding of our virtual community has developed from a longitudinal perspective of participant observation, supplemented by interview and case studies. This embedded position, also referencing grounded theory (Glaser and Strauss 1967) in a continuing theoretical discussion, has required the author to be at once administrative manager, researcher and Halls resident/active member of the community. Regular members of the community have accepted and absorbed this multiple perspective and quickly settled on an informal title that recognises the unique position held by my avatar, Elsa Dickins. Their unprompted decision to call Elsa "Mummy" references trust, community/family membership and submission/authority, providing a rich seam for future discourse analysis.

In an environment where identity, mediated through an image that can be changed at the click of a mouse, is often seen as a fluid concept, there is currency in demonstrating a consistent identity and in the sharing of confidences to purchase trust within a community (see Peachey 2010). For example students might use the private messaging system to share some aspect of their self that has no direct relevance to their interactions online, such as a disability or their sexuality, because they feel that they are not being "themselves" with their correspondent if he or she is not aware of this aspect of their identity. Experience and evidence suggests that the majority of users have a strong perception of the potential for misunderstanding in discussion that is mediated through text, and go out of their way to support, acknowledge

and defer to one another in conversation. When differences have arisen, members of the community have expressed real distress, and have worked together to resolve and move forward. Differences in personality and backgrounds have generally been celebrated, and again the community has worked together to involve the individual members with more challenging characteristics. Leadership has been fluid, changing according to the skills and experience needed within a context, and multiple perspectives are provided by the multimodal communication networks (including the Schome wiki and fora, a First Class forum, email, MSN, Google docs and Facebook) in which the group operates. Members challenge each other to explore new interests and provide support in doing so, for example a regular (student) member of the community, comments that, "As a community, we organise outings to exhibits in Second Life. Not all of them are relevant to my studies but I have a circle of friends in Second Life that broaden my horizons and so my interests are wider as a result."

6.5 The Third Place

6.5.1 The Character of the Third Place

Oldenburg (1991) describes a taxonomy of place wherein a first place is an individual's home and family, a second place is the workplace (where someone may spend more time than their home), and a third place is an informal public/neutral gathering place such as a beer garden, post office, coffee shop, library etc, lending "a public balance to the increased privatisation of home life." He argues that these Third Places, or "great good places" are "anchors" of community life, essential to community social vitality and to fostering broader and more creative interaction, and are notable generally for the following characteristics:

- cheap or free food and drink
- being highly accessible/proximate for many
- being welcoming and comfortable
- involving regulars/habitual participants
- providing both old and new friends

In contrast to the first and second places, Third Places encourage and enable the putting aside of mundane concerns so that individuals can live in the moment, enjoying the company, activity and conversation around them. Third places level the status of users, creating habits of public association and providing comfort and familiarity to individuals and communities.

> The character of a third place is determined most of all by its regular clientele and is marked by a playful mood, which contrasts with people's more serious involvement in other spheres. Though a radically different kind of setting for a home, the third place is remarkably similar to a good home in the psychological comfort and support that it extends. . .They are the heart of a community's social vitality [. . .]. (Oldenburg 1991)

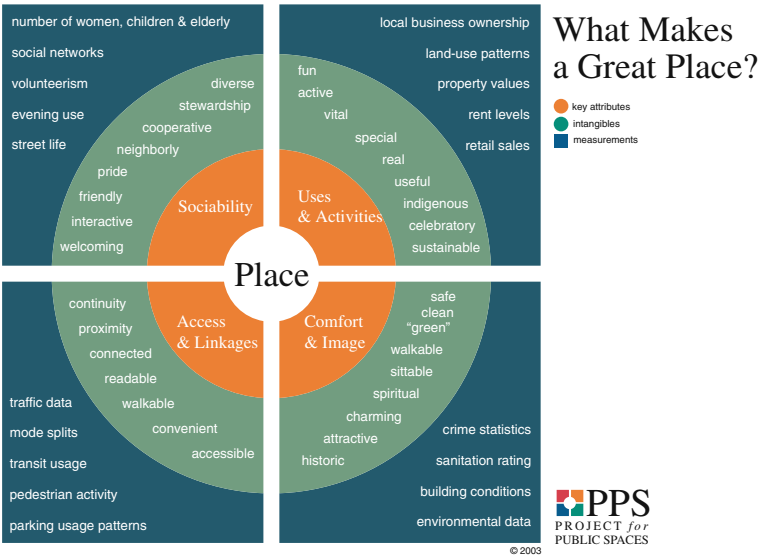

Fig. 6.5 What makes a great place?

Project for Public Spaces, in New York, developed the Third Place diagram in consultation with Oldenburg (see Fig. 6.5).

The key attributes, in the central segments, provide guidance for the detail of the measurables and intangibles in the outer segments.

6.5.2 The Third Place Online

Oldenburg was first referenced in the context of online communities in 1994, by Rheingold:

> It might not be the same kind of place that Oldenburg had in mind, but so many of his descriptions of third places could also describe the WELL. [the forum community to which Rheingold belonged] Perhaps cyberspace is one of the informal public places where people can rebuild the aspects of community that were lost when the malt shop became a mall. Or perhaps cyberspace is precisely the wrong place to look for the rebirth of community, offering not a tool for conviviality but a life-denying simulacrum of real passion and true commitment to one another. In either case, we need to find out soon. (Rheingold 1993, p. 26)

Over a decade on, most researchers agree that the internet is neither the utopia nor dystopia that early theorists predicted but a middle ground with light and dark shades. We have continued to explore communities with increasing variance in the means through which they come together and, in 2006, Steinkuehler and Williams applied the notion of Third Place to their experience of community in Massively

Multiplayer Online Games (MMOGs) – virtual worlds with game narratives. They found that:

> By providing spaces for social interaction and relationships beyond the workplace and home, MMOs have the capacity to function as one form of a new "third place" for informal sociability much like the pubs, coffee shops, and other hangouts of old. (Steinkuehler and Williams 2006 p. 1)

Glogowski (2006) proposed that an online blogging community he builds with his students each year resembles a Third Place. He took the Project for Public Spaces diagram and re-versioned the measurables to indicate what the key attributes provide within this new context, as shown in Fig. 6.6 below:

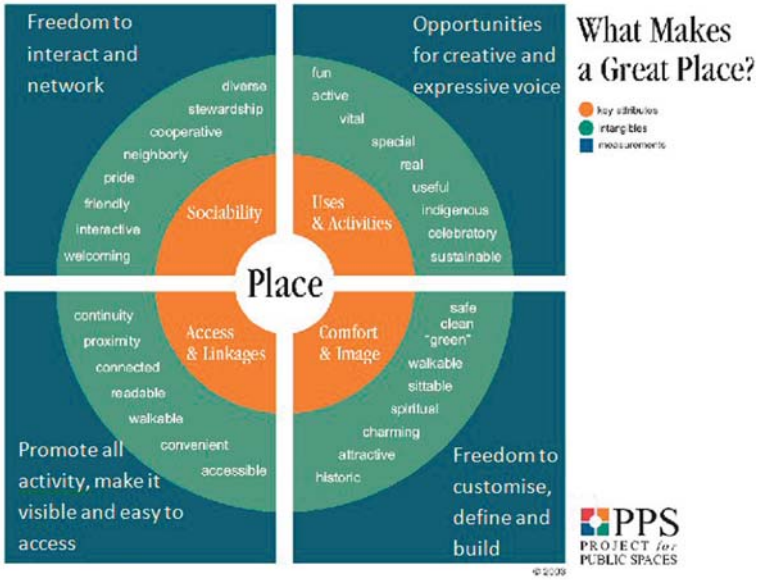

Fig. 6.6 Blogging community as Third Place

6.5.3 The Third Place for the OU in Second Life

Glogowski's model is just as applicable to the environment that hosts the OU community in SL. Members have total freedom to interact and network inworld, and although many of these associations have spilled out into other social networking tools and media, SchomeBase and Open Life remained a primary focus for interaction. Social activity is indeed diverse, cooperative, neighbourly, friendly, interactive and welcoming, and is executed with stewardship and pride. Within the environment members have the opportunity to use their creative and expressive voice and do so in activities that are fun, active, vital, special, real, useful, indigenous, celebratory and, to date, sustainable. With no more restrictions than in the physical world, members of the community have the freedom to customise, design and build. Those members

who rent an apartment in Halls can decorate as they wish, and there is often rigorous discussion about what other changes might or might not need to be made to the rest of the island. The nOUbie centre is often used as a village hall, for meetings and events, and a collaborative building group have taken ownership of one half of the top floor. As a community, should the group wish to add or take away some element of the island environment they are empowered to do so, or to have the action taken on their behalf. However it is interesting to note that the environment can be argued to meet many of the intangibles already listed in the associated quadrant – safe, green, clean, walkable, sittable, spiritual (probably most tenuous, although a meditation animation on a cushion beneath a tree proved very popular), charming, and attractive (see Fig. 6.7) – and members are generally satisfied with the "comfort and image" of their surroundings. In the next iteration of the island, it is anticipated that historic will also be incorporated. Finally, the access and linkages quadrant requires that the Third Place has continuity and proximity and is connected, readable, walkable, convenient and accessible, all of which are reflected within the context of the inworld environment. Over the period that the community remained on Schomebase, members promoted activities using the Schome wiki (also streaming it inworld) and group notices, as well as notices placed around the island. However this is probably the weakest aspect of the location as a Third Place, and plans for the next phase of the project address the need for continuity of promotional media.

It is evident that all the characteristics of a Third Place are met in the SchomeBase/Open Life environment. SL may not offer a cup of coffee (although the seating area at the Halls would animate an avatar with a virtual one), but users are generally sitting at a computer in their own home, with the refreshments of their choice at hand. With the appropriate hardware and sufficient broadband connection, Second Life has the key aspect of being accessible and proximate to anyone, regardless of physical location. Verbal feedback and evidence of continued use by repeat visitors indicates that SchomeBase and Open Life islands are welcoming and comfortable environments, and there is a consistent mix of regulars and newcomers to both islands, so a regular visitor is likely to meet old friends and make new connections during their visits.

Martin (2006), noted, "People are moving away from traditional educational institutions for their day-to-day needs of updating, networking and learning," and at least one student from the OU SL community would agree: "After studying for 3 years with only tutorials as my main contact with students, interacting with others in Second Life makes me feel less isolated. It's amazing how included you feel. You

Fig. 6.7 Images from SchomeBase and Open Life

think it will be just looking at a screen but Second Life makes you more conscious than ever that behind those avatars, there are real people. With the caring responsibilities I have, I would never have been able to take part in the activities offered by the OU if they hadn't been in Second Life – everyone joins in and really helps me learn."

6.6 Conclusions and Next Steps

It is not possible to know whether the current community would have come together without the catalyst of the Sholokhov Halls, but it is evidenced that the Halls and surrounding island locations have enabled a Third Place environment.

Until January 2009, the Third Place community on SchomeBase/Open Life was defined by its location at the Sholokhov Halls, although the community activity on the island was unrestricted by membership of these virtual buildings. This group, with a core of about 50 regular users and more on the periphery, consisted entirely of OU staff and students. This wasn't deliberate, and the OU community made a big effort to use Schome groups and facilities such as the wiki to publicise activities including a sim-wide arts exhibition, but the greater Schome community (who had worked in Teen Second Life but never had a particular focus in SL) chose not to participate. Over time this division began to pose issues for both communities – one member of Schome expressed concern that SchomeBase was becoming too strongly associated with the OU, and the OU community were restricted by a project that was imposed upon them. A suggestion that the Halls be demolished to make way for an extended sandbox (open building area) enabling more freedom on the island, which projected a clearer fit with the more investigative Schome ideals, was met with significant resistance from the community. Instead, in order to continue providing the "psychological comfort and support" (Oldenburg 1991) that a Third Place extends, it was proposed that the community be asked instead to relocate to a dedicated new island.

Tuan (1980) addressed the difference between an identified location and the undefined space that surrounds it, citing a strong "Sense of Place" for those spaces that hold significant meaning, names or definitions. Without the Halls, would the members and users of the island have a strong enough Sense of Place for the Third Place to remain? The new island would have a greater capacity for residences, with dedicated administrative support, and would be a perfect opportunity to extend the metaphor of a physical world village community, with for example village hall, library, village store etc. The OU community, now able to function freely and explore its own limits with no branding tensions, will also have a dedicated support website and wiki on standard OU webspace to replace the events pages used on the Schome wiki.

In order to maintain the sense of ownership among the community through the transition period, at a time when it might be seen as very vulnerable, it was considered crucial that members were given the opportunity to have input to the core details and components of the new island. A survey was used to gather input on key

points, for example a village traditionally has a pub, and residents chose to adopt this metaphor wholly rather than approve a general seating area, coffee bar or even fake pub front. The new island will see this village inn realised as The Open Arms, as well as small houses for rent instead of Halls, allotments, a village green and a duck-pond. The new island will be separated physically and figuratively from Open Life – increasingly formalized by the structured activities that take place there – by an ocean on which residents and visitors may sail boats, a popular pastime using the physics engine of SL. The island will also host an exhibition centre, Open Minds, that residents may book and use as they please, with a permanent exhibition room dedicated to the history and development of the OU social presence in SL. Finally, driven by the "spiritual" requirement in the Oldenburg model and noting that a village traditionally has a church, respondents to the survey were asked if they would like to see a spiritual area on the new island and, if so, what form it should take. Over half answered yes rather than no or don't know, and the majority choice was a tor or standing stone. This will be known as Sholokhov Tor, threading a sense of history and connectivity from the original Halls to the new island.

OU students working at a distance have always been vulnerable to a sense of social isolation and exclusion from the collective student identity. Knowles (1984) describes the social component of learning as key to the success of adult learners. The established OU community in SL, active enough to support its own learning by organising a variety of special interest and discussion groups as well as social events, demonstrates a significant achievement in using the affordances of a virtual world to overcome some of the core challenges to our student's learning experiences. In addition it has allowed students to enter into learning without social baggage and other disadvantages they may carry in the physical world.

The move to a dedicated island, with resources for adequate administrative support, offers the opportunity to sustain and grow the community and to verify the exemplar of the Third Place model to this context. It also moves the project from an exploratory phase of research into a position of extending and defining appropriate research models for this new frontier.

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Chapter 7
Design and Delivery of Game-Based Learning for Virtual Patients in Second Life: Initial Findings

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Abstract This chapter will present game-based learning activities developed for virtual patients based on the four-dimensional framework developed by De Freitas and Martin, as well as other design considerations that look at emergent narratives and modes of representation. This chapter will also present the interaction and call-management structure implemented between the Second Life™ (SL) virtual world environment and the world wide web environment. This chapter also represents an overview of the finding of a recent trial aimed to explore attitude towards two e-learning delivery methods including the delivery of game-based learning for virtual patients in SL.

7.1 Introduction

Medical education faces difficult challenges in the twenty-first century. Increasing pressure upon doctors to deliver service targets, the European Working Time Directive, and changes in the way in which healthcare is delivered (Olson et al., 2005), coupled with higher numbers of students entering medical education, have increased the demands on academics, resulting in less time for teaching (Ruiz et al., 2006). Various forms of representative simulation, many of which use digital technology, have become an increasingly common alternative in healthcare education (Begg et al., 2005).

Many high-quality e-learning materials are being produced by medical schools and healthcare organisations (Ruiz et al., 2006). "Virtual patients" is one of the models developed to support the delivery of clinical teaching. A virtual patient is an interactive computer simulation of real-life clinical scenarios for the purpose of medical training, education or assessment.

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There are many ways a virtual patient can be used in an educational setting. For example, the role of the learner may take many forms with respect to the part the student may take and the role of the physician, the patient, etc. The learner may be acting independently, or under the guidance of an instructor, or in a collaborative setting. The learner may progress through a predefined scenario or may start from scratch (Ellaway et al. 2006).

In the area of medicine, however, there are limitations to what traditional virtual patients can offer in terms of either a game-informed learning experience or a real patient experience, as the narratives that accompany and describe many current virtual patient scenarios are simplistic and linear (Begg et al., 2005). The delivery of these linear and simplistic levels of interaction to current medical students brings several challenges. These students, usually in their 20s, belong to the "games generation", being native speakers of the digital language of computers, video games, DVD players, mobile phones, eBay, iPods and the internet (Holloway and Valentine 2003). They are "digital natives" (Prensky 2001).

The "gamer generation" has a cognitive style characterised by multitasking while learning, short attention span during learning, and an exploratory and discovery approach to learning (Asakawa and Gilbert 2003; Bain and Newton 2003; Prensky 2005). When gaming, learners play first, understand after, and then generalise in order to apply the learning acquired in a new situation (Saethang and Kee 1998).

Anecdotal evidence from teachers suggests that the impact of gaming on millions of "digital natives" who grew up playing best-selling games such as SimCity is starting to be felt (Squire 2002). The designers of computer and video games have perfected a way of learning that goes well with the new skills and preferences of these digital natives. Video and computer games are in many ways a "perfect" learning mechanism for this group (Prensky 2006).

Learning by games results in the acquisition of new knowledge, the transfer of learning, the development of intellectual skills (abstraction, anticipation, strategy-building, problem-solving, spatial representation, function-movement relationship), and the development of behaviour and attitudes (Whelan 2005; Sauvé et al. 2007). The terms "games" and "simulations" tend to be used interchangeably, therefore it is important to identify their differences. According to Sauvé et al. (2007) games and simulations are distinctive concepts. A game is

> a fictitious or artificial situation governed by rules which structure their actions in view of an objective which is to win or to overcome an obstacle. They are integrated into an educational context when the learning objectives are associated formally to the content and the game enhances learning in the cognitive, affective and/or psychomotor domains.

On the contrary,

> a simulation does not necessarily involve competition, and the users are not trying to win. Many educational simulations, unlike games, can function without human intervention.

Games suspend the rules of reality in order to use the rules of a game. On the contrary, simulations attempt to model a system in a manner that is consistent with reality (Heinich et al., 1996). Sauvé et al. (2007) have provided a description that

defines essential elements in games. Five attributes have emerged that cover the concept of "game": player or players, conflict, rules, predetermined goal of the game, and its artificial nature. A sixth attribute is given to educational games due to its pedagogical nature.

According to Aldrich (2005), there are four traditional simulation genres:

- Branching stories: learners make multiple choice decisions. The decisions impact on the evolution of the story, ultimately terminating in either successful or unsuccessful outcomes.
- Game-based models: players engage familiar and entertaining games such as Wheel of Fortune®, solitaire or memory, with important pieces of linear or task-based content.
- Virtual Labs/Virtual Products: players interact with visual, selectively accurate representations of actual products without the physical restrictions of the reality.
- Interactive Spreadsheets: focus on abstract business school issues such as supply chain management, product life cycle, accounting, etc.

Aldrich (2005) also identifies a series of game genres highlighting the fact that they can be crossed and mixed.

- Real-Time Strategy games: this type of game genre might be the most intense learning experience. The player manages the concepts of exploration, building, defending, logistics and conquering.
- First-Person Shooters: the player sees the world through the eyes of his or her onscreen counterpart or "avatar". Some high-level learning can be identified in this genre, including hand-eye coordination, how to read and use maps, navigational skills and problem solving.
- Management SIMS/God Games: similar to real-time strategy games, player control enterprises or nations over decades.
- Role-Playing Games: in these games the player manages a person or a team through increasingly challenging scenarios, building his/her character's skill sets and inventories to meet the increasing conflicts.
- Massively Multi-Player Online Role-Playing Games (MMORPGs): in this type of games a persistent online world hosts unlimited number of players taking on first person shooters or role-playing missions and activities. In MMORPGs players form deep relationships with which to perform heroic quests carefully balancing each other's strengths and weaknesses.

Provenzo (1992) argues that children are losing opportunities to develop their creativity by playing video games and educators fear that video games might foster violence, aggression, negative imagery of women, or social isolation. However, other authors, such as Ellis (1983) argues that like any popular media, video games become the building block of children's worlds. Children do not play games in isolation. They often play in groups and when they do not, they share their experiences socially and very often using Web 2.0 technologies.

The term game-based learning has emerged as a generic name for the use of games for learning or educational purposes. It has also been termed "serious games", and includes fully immersive virtual worlds, in which learners can take on virtual presence within these worlds (Joint Information Systems Committee 2007). Gee (2003) also observed how successful game play and experiential learning opportunities have been shown to share common aspects. Virtual patient scenarios offer opportunities for "game-informed learning". This is due to their experiential and problem-based learning approaches as prime pedagogic drivers. The process of game play is so similar to the learning processes outlined in problem-based learning that the two are almost interchangeable (Begg et al. 2005).

The lack of immersion in current virtual patient delivery, as well as the familiarity of our "digital natives" with virtual and game-based environments, have been the motivation for this piece of research. Virtual worlds offer rich interactive 3D collaborative spaces where users can meet and interact. Some authors recognise Second Life™ (SL) as a game-based application providing a space in which games can be created, allowing highly structured linear experiences as well as more open-ended ones. However, some do not classify it as a game, because of its lack of predefined goals (Livingstone 2007).

In order to drive learning by game play within a virtual world, different mechanisms should be effectively implemented. These mechanisms include: immediate feedback, interaction, active participation by the learner, player control of their learning, repeated practice, challenge, motivation, dialogue between players and teamwork (Barnett et al., 2005; Griffin and Butler 2005; Schwabe and Göth 2005; Shreve 2005; Virvou et al., 2005; Ward and O'Brien 2005).

Some educators find games as powerfully motivating digital environments and study video games aiming to determine how motivational components of popular video games might be integrated into instructional design (Bowman 1982; Bracey 1992; Driskell and Dwyer 1984). These studies are few in number and somewhat outdated, taking into account recent advancements in game theory and game design. Furthermore, these studies have failed to consider the social contexts of gaming and more recent developments in gaming, such as the Internet (Squire 2003).

Malone (1981) and Malone and Lepper (1987) identified four features that motivate persistence and enjoyment of games:

- Challenge: a learning environment that is neither too simple nor too difficult.
- Control: the players must feel their actions affect the outcomes of the game.
- Curiosity: when games provide exploratory opportunities leading to unpredictable outcomes.
- Fantasy: the perception of the gamer of being part of the game.

Malone (1981) also argues that educational programs should have:

- Clear goals that students find meaningful.
- Multiple goal structures and scoring to give students feedback on their progress.
- Multiple difficulty levels to adjust the game difficulty to learner skill.

- Random elements of surprise.
- An emotionally appealing fantasy and metaphor that is related to game skills.

From the motives identified as reasons for playing games, arousal is the one that appears to be most closely associated with enjoyment (Boyle and Connolly 2008). When arousal decreases an individual tends to become bored or under-stimulated and therefore performance will be poor. On the other hand, when arousal is optimal, performance will be at its best but when arousal increases this leads to anxiety and performance decreases as a consequence.

Flow Theory has become very significant in explaining the feelings of enjoyment including playing computer games as well (Sherry 2004). According to this theory, arousal will increase as a task becomes more challenging but performance and enjoyment will depend on the level of skills. Csikszentmihalyi's model of optimal flow describes the complete levels of enjoyment, immersion and involvement that people feel when taking part in favored activities (Boyle and Connolly 2008). Flow is achieved when a gamer reaches an optical match between his/her skills and the challenges presented by the game.

According to Squire (2003), video game designers create these emotions by balancing a number of game components, such as character traits, game rewards, obstacles, game narrative, competition and opportunities for collaboration with other players. The rewards the player experiences and the manner in which those rewards are structured and delivered are very important factors which drives motivation among players. A wide variety of rewards can be implemented (Only a Game 2005):

- Currency rewards: the acquisition of a game resource that can be spent.
- Rank rewards: like currency rewards, the player gains benefits from acquiring points.
- Mechanical rewards: such as increases in stats that the player can feel the effect of.
- Narrative rewards: narrative exposition is effective for certain players as a reward.
- Emotional rewards: when the player feels they have done something for someone in the game.
- New Toys: new artifacts are given to the player as a reward.
- New Places: like new toys, new places are given as a progression within the game.
- Victory: defeating a challenging player.

The other aspects of how rewards are designed are the way the delivery of the rewards is structured:

- Fixed Ratio Schedules: these provide rewards after a fixed number of actions.
- Variable Ratio Schedules: these provide rewards after a random number of actions. This is effective with all play types – but burnout is always a risk.
- Fixed Interval Schedule: this is a reward that is provided after a set amount of time.

- Variable Internal Schedule: like the variable ratio schedule, this produces a steady rate of activity with no pauses but is not as intense as the variable ratio scheme, because players quickly learn that their actions are independent of the reward. These are good for encouraging a player to come back to certain places in a game.

Types of rewards and schedules that control the delivery of rewards maintain players interested in the game they are playing. The game-based learning model developed for the delivery of virtual patients, implemented different types of rewards and schedules. These will be highlighted in Section 7.2.3.

7.2 A Framework for the Design of Game-Based Learning for Virtual Patients

The framework for evaluating games and simulation-based education developed by De Freitas and Martin (2006) has been followed for the design of game-based learning activities for virtual patients in SL.

The framework requires consideration of four main dimensions in advance of using games and simulations. These focus on the:

- particular context where learning takes place, including macro-level contextual factors
- attributes of the particular learner or learner group
- internal representational world of the game or simulation
- pedagogic considerations, learning models used, approaches, etc.

According to De Freitas and Martin (2006), the four dimensions provide a framework for consideration of both existing and future educational games and simulations, as well as other forms of immersive spaces, such as virtual reality. This framework provides a close relationship with the systems of activity theory (Kuutti 1996).

Different learning types identified and discussed by Helmer (2007) have also been taken into account in the design of these game-based learning activities. These learning types are demonstration, experiential learning, diagnostic activities, role play and constructive learning.

7.2.1 Influential Factors of Emerging Narrative

The three potential influential factors of emergent narrative discussed by Murray (1997) – emergent narrative (linear content), the responsive environment and the psycho-social moratorium (cyclical content) – which allow the learner to feel their interactions have real consequences, were also taken into account in the design.

7.2.1.1 Emergent Narrative – Linear Content

The progress of the story is defined and influenced by the choices the learner makes. The navigational pathways in the virtual patient case in SL will be enriched by the virtual world. Introductions in the form of audio, video and "notecards" allow the learner to progress through the case.

7.2.1.2 The Responsive Environment

The learner will expect the environment to respond to his/her input. These expectations will not be limited to one path in SL. Learners will be able to follow different routes and move from different areas within the virtual hospital, e.g. laboratory and radiology department. Different activities will then be triggered and the results of investigations will be released to learners depending on their choices, using Scaffolding information in the form of audio, video and "notecards". Some forms of Assessment mainly using multiple choice questions will also be provided.

7.2.1.3 The Psycho-Social Moratorium – Cyclical Content

Successive attempts can be made to achieve the main objective of the case. Each attempt will be increasingly informed by knowledge acquired in previous attempts. Learners will be encouraged to return and try again. Diagnostic capabilities are driven by credit in Linden $ given at the beginning of the case. A series of Triggers will be implemented to allow the learner to progress through the case. A database-driven solution is being implemented in order to record and track learners' activity and progression. This means that when learners return to the case, they will be able to continue at the point they left.

A region has been developed in SL where a virtual teaching hospital (http://slurl.com/secondlife/Imperial%20College%20London/150/86/27/) has been created. A series of activities was developed covering the different areas of a virtual patient (medical history, differential diagnosis, investigations, working diagnosis and management plan).

7.2.2 Framework: Context and Learner Specification and Narratives and Modes of Representation

Different narratives and modes of representation were developed within the areas described above (introductions, scaffolding information, diagnostic capabilities, assessment and triggers) (Toro-Troconis et al., 2008).

7.2.2.1 Context, Learner Specifications and Pedagogic Considerations

The design of game-based learning activities in SL (Table 7.1) focused on the first, second and fourth dimensions outlined by De Freitas and Martin (2006).

Table 7.1 Framework for the design of game-based learning activities – context and learner specifications

Context	Learner specifications
Game-based activities will be delivered in Second Life to third-year undergraduate medical students at Imperial College London	Third-year students. Average age 22 years
A module on respiratory medicine focused on pneumothorax will be embedded in Second Life using game-based learning activities	The game-based activities can be used by learners working singly or in groups
This module has already been embedded in the curriculum as part of the Year 3 e-lecture programme	The virtual presence of the tutor is not required
Significant technical support and resources will be required during the first delivery of this module in Second Life	At present, it can only be played as part of the pilot project
Pedagogic considerations	
Use of theories, such as Kolb's theory of experiential learning (1984) where the learner "touches all the bases", i.e. a cycle of experiencing, reflecting, thinking, and acting leading to observations and reflections. These reflections are then assimilated into abstract concepts with implications for action	
Learning outcomes	
By the end of the activity learners will be able to: identify and select the right investigations leading to the right diagnosis, provide the right diagnosis for different respiratory emergency cases and provide the right treatment based on the final diagnosis	

7.2.2.2 Narrative and Modes of Representation

Some aspects of the third dimension described by De Freitas and Martin (2006), as well as some of the learning types outlined by Helmer (2007), are described in relation to aspects of SL in Table 7.2. This table also identifies different aspects of emergent narrative described by Murray (1997), which allows the learners to feel that their interactions have real consequences.

Scaffolding activities take the learner through the virtual patient experience making them progress through the virtual patient activities from Medical History to Final Diagnosis. Figure 7.1 shows the Differential Diagnosis and Investigations section.

Figure 7.2 shows one of the triggers implemented. The learner has to click on the wash basin and wash his/her hands before talking to the patient.

The following sections describe the web world environment implemented, consisting of a three-tier architecture, and the technical architectural model followed based on the MedBiquitous-user virtual patient architecture.

Table 7.2 Framework for the design of game-based learning activities – narrative and modes of representation for virtual patients in Second Life

Section	Introductions	Scaffolding	Diagnostic capabilities	Assessment	Triggers
Introduction	"Notecards" will be provided at the beginning of the case	An introductory "notecard" with learning outcomes of the activity is provided in the reception	The time on the case and all actions triggered by the learner will be recorded	Assessment will not be provided in this section	Introduction to the activity delivered as a "notecard"
Medical history	Audio and "notecards" will be provided at the beginning of the case	Participants are not allowed to access patient information until they wash their hands	No other diagnostic capability will be provided in this section, but the time will continue to be recorded	Assessment will not be provided in this section	Hand wash
Differential diagnosis	Audio, diagrams and "notecards" will be provided	As soon as a participant selects an investigation he/she will be prompted with a question about the differential diagnosis	No other diagnostic capability will be provided in this section, but the time will continue to be recorded	A multiple-choice question on an interactive board is provided	Different signs by the patient's bed will trigger patient information in different formats
Investigations	Audio and "notecards" prompt learners to select appropriate investigations. Learners' accounts credited with Linden Dollars (L$) used to purchase investigations required. They will be reminded to wash their hands when go into the investigation areas	Once the participant pays for the investigation(s), the results can be picked up from the different test areas, such as: radiology department, laboratory, etc.	A series of objects that represent tests set at varying prices which relate to relative real-life values. Correct set of tests will leave some L$ spare from the initial amount. Purchasing all tests will cost more than the amount of money given (over budget)	Multiple-choice questions on an interactive board will be provided when the results are picked up from the different investigation areas	By selecting the different investigations available they will be able to purchase them and move into the investigations area to find out the results

Table 7.2 (continued)

Section	Introductions	Scaffolding	Diagnostic capabilities	Assessment	Triggers
Working diagnosis	Diagrams and "notecards" will be provided	Participant clicks on the "working diagnosis" sign by patient's bed and a question about the final diagnosis will be presented	No other diagnostic capability will be provided in this section, but the time will continue to be recorded	A multiple-choice question on an interactive board is provided	The "working diagnosis" sign by the patient's bed will trigger this section
Management plan	Audio, diagrams and "notecards" will be provided	The participant can visit the Management Plan area and find out about how to manage the patient's condition	No other diagnostic capability will be provided in this section, but the time will continue to be recorded	Multiple-choice questions on an interactive board will be provided	Interaction with learning stations for each condition trigger information in different formats

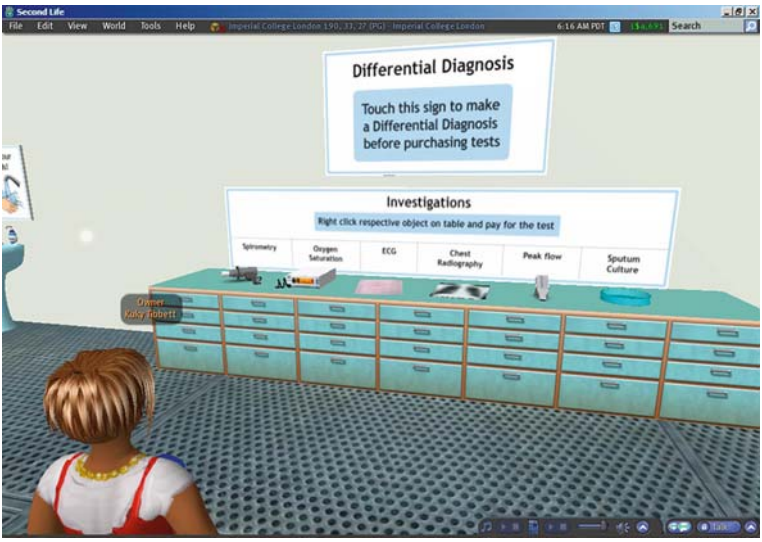

Fig. 7.1 Differential diagnosis and investigations area

Fig. 7.2 Triggers – hand wash

7.2.3 Designing Rewards

A series of rewards and schedules were designed and implemented for the delivery of virtual patients in SL. A "Heads Up Display" (HUD) was designed with the purpose of delivering rewards information as well as keeping the learner informed of his/her progress (Fig. 7.3).

Rank rewards information is delivered to the learner via the "progress bar". Although the learner does not receive points, the progress bar shows how far the learner is in the process of diagnosing each of the patients offering a sense of progression and therefore completion. Mechanical rewards are represented by the "Top Scorer" section which the player can feel the effect of. New Places has been represented by the fact that the learner can progress a step further into the diagnosis process. The progress bar provides the information required for the learner to identify a new stage completed as a reward. The HUD section "Top Scorer" also provides the Victory rewards offering the learner the opportunity to defeat other medical students.

One schedule drove the delivery of these rewards in this design. Fixed Ratio Schedules are represented in several ways: the learner is only able to talk to the patient after washing his/her hands, the learner is able to pick up the investigations results only after paying for them, the final diagnosis section can only be accessed if at least one correct investigation is paid for and its corresponding result has been picked up from the investigations section.

Other schedule types will be implemented in the near future.

Fig. 7.3 Heads up display (HUD) – respiratory ward

7.3 Web Application Development

The web application development implemented involved the creation of a web-site service which aims to record the in-world user interaction in the database external to SL and then create a presentation layer for when placing these data into the various report formats. The following figures show examples of some of the key modules (Figs. 7.4 and 7.5).

Fig. 7.4 Web application – authentication

Fig. 7.5 Web application – reports

7.3.1 Interaction and Call Management

The SL simulation environment consists of the SL client installed on the user's machine. The SL client communicates with the SL engine for catering the user responses and rendering the media assets for the user. In order to access the external web world, the HTTP request call is established through Linden Scripting Language (LSL) from the SL simulation environment. The LSL compiler takes the active role in validating the script statement before execution.

Figure 7.6 shows the interaction and call management between the SL virtual world environment and the web world environment.

The web world environment consists of the three-tier architecture based on Java 2 Platform Enterprise Edition (J2EE)'s model view controller (MVC) design pattern.

- Tier 1 (web server): static content such as HTMLs, media elements (JPEG, GIFs, JavaScript) are directly served from the web server. The web server forwards requests for server side components such as Java Servlets, JavaServer Pages (JSPs), and other Java classes (Action classes, Delegates, Service Locater) to the Servlet runner.
- Tier 2 (application server): the application server is responsible for deployment, object pooling (Activation and Passivation) of session beans, and transaction support to the session beans. The persistence layer is also implemented on the application server.
- Tier 3 (database): the third tier is the database, which is the central repository of all data the system generates and queries to create the reports.

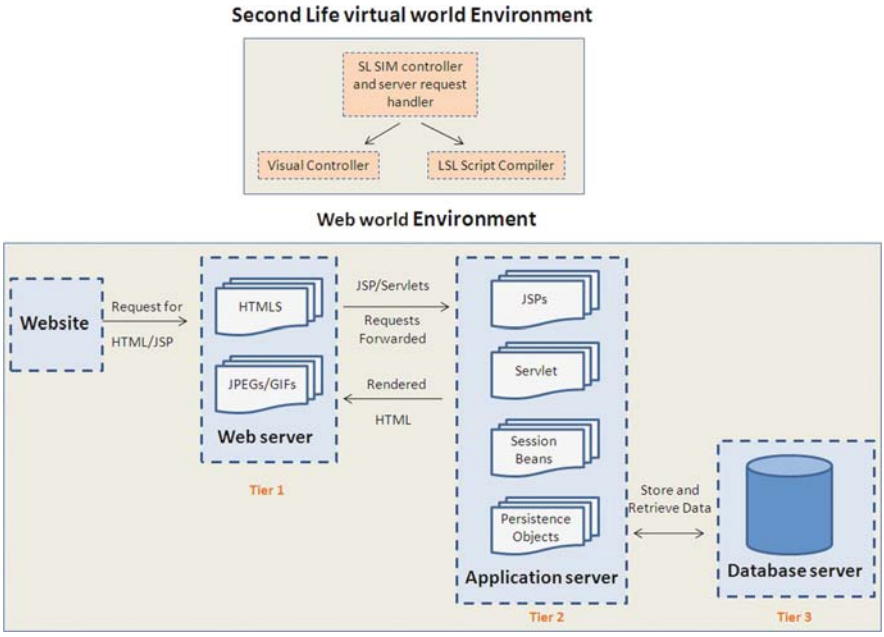

Fig. 7.6 Interaction and call management

7.4 Learning Design – Interoperability

Apart from the virtual patient standards described above, a standardised, interoperable approach for sharing game-based learning activities in virtual worlds is worth exploring. It would allow teachers and learning technologists to compare and contrast game-based learning scenarios, allowing best practices and lessons learned to emerge (Burgos et al., 2007). The development of generic game authoring environments across virtual worlds may lead into interoperable game-based learning activities, which means that one game-based learning activity authored in one virtual world, such as SL, could be exported and re-used in another virtual world, such as Active Worlds. The IMS Learning Design specification is worth looking at in this respect. The implementation of the IMS Learning design specification allows different game implementations authored in different game engines to be played in different IMS conformant game engines (Moreno-Ger et al., 2007).

> The development of a framework that supports pedagogical diversity and innovation, while promoting the exchange and interoperability of e-learning materials, is one of the key challenges in the e-learning industry today. (IMS Learning Design 2003).

IMS Learning Design Level C introduces notification or "messaging" both between system components and between roles. This adds a new dimension by supporting real-time event-driven work/learning flow. Activities can then be set as a consequence of dynamic changes to the learner's profiles and/or of events generated in the course of the learning activities. It can also be used to trigger messages being dynamically sent to participants. This would enable the automation of learning flow activities, which are triggered by the completion of tasks. Level C would allow role-play/game-play and event-driven simulations (IMS Learning Design 2003).

7.5 Experimental Methodology

7.5.1 Subjects

This investigation involved 42 undergraduate medical students (21 years old). The gender distribution of the respondents was 42.85% female ($n = 18$) and 57.14% male ($n = 24$).

7.5.2 Instruments

The survey "My feelings when playing games", developed by Bonnanno and Kommers (2008), was applied. The survey comprises 21 statements. Six statements relate to the affective component, five statements are about perceived usefulness, six statements about perceived control and four statements about behavioural components. All statements describe behaviours while using games. The statements were adapted depending on the groups: "My feelings when learning in SL" and "My feelings when learning via e-modules". Situations with positive feelings, as well as

situations with negative feelings such as fear, lack of control, and hesitation have been addressed. A five-point Likert scale was used.

Gaming competence was addressed by identifying participants under two different computer/videogame categories: high gamers or low gamers.

- High gamer includes all participants who responded having played computer or videogames a few days ago or a few months ago.
- Low gamer includes all participants who responded having played a few years ago or never.

Although gaming competence was addressed by identifying high and low gamers based on their time spent playing, it is worth pointing out the more traditional classification of gamers in industry at present. According to Wallace, M. and Robbins, B. (2006) within the games industry, players are often assigned to one of three broad categories:

- Hardcore Gamer: gamers who typically play high-action, extremely competitive games that require a greater degree of involvement in order to progress.
- Core Gamer: gamers who typically play games with a steeper learning curve or games that require some level of deeper involvement or complex tactical challenges.
- Casual Gamer: gamers who play games for enjoyment and relaxation rather than games with steep learning curves or requiring high levels of commitment or involvement.

Although these audience segments are not mutually exclusive, the distinction between these three general categories are useful for understanding the different types of video game experiences and play patterns identified within each group.

7.5.3 Procedure

Data about gaming competence were collected at the beginning of the investigation, aiming to identify gaming tendencies among undergraduate medical students.

The sample analysed included 118 full-time undergraduate medical students of average age 22 years. The majority of respondents (47%) were male, and (34%) of all students completed the survey.

The majority of participants surveyed were classified as high gamers (70%). The majority of male participants were high gamers (87% of all males surveyed), while only about half of the female participants were high gamers (54%).

The majority of the participants had never heard of SL (66%). However, 50% of male participants had heard of SL, in comparison to only 13% of female participants.

From this group, a stratified sample ($n = 42$) was selected according to gender and high- and low-gamer categories. One group ($n = 23$) was given access to the game-based learning activity for a virtual patient on respiratory medicine developed

Table 7.3 Computer and videogame player categories by gender for Second Life group

Second Life	Total number	Total (%)	Male (%)	Female (%)
Low gamer	7	30	4	26
High gamer	16	70	48	22
Total	23	100	52	48

Table 7.4 Computer and videogame player categories by gender for e-module group

e-module	Total number	Total (%)	Male (%)	Female (%)
Low gamer	3	16	10	6
High gamer	16	84	53	31
Total	19	100	63	37

in SL following the framework described in this paper. The second group ($n = 19$) was given access to the same content, covering the same virtual patient but delivered as an interactive e-module. The surveys "My feelings when learning in SL" and "My feelings when learning via e-modules" were given to the groups, to be completed at the end of each session, which lasted 40 min each. The scores for the separate statements were coded in Stata version 10, using reverse scoring for unfavorable statements.

The results based on computer and videogame player categories by gender for the SL group are shown in Table 7.3, and those for the e-module group in Table 7.4.

The SL group was given an introduction (20 min) at the beginning of the session. The introduction covered basic navigational techniques in SL, e.g. how to access notecards.

A focus group was also carried out with only the SL group at the end of the activity, in order to address the social dimension for collaborative work when learning in SL as well as other accessibility and usability issues not addressed in the survey.

7.5.4 Results and Analysis

Data about gender, gaming competence and identified attitude components were entered in Stata using the appropriate codes. A number of variables were constructed by computing individual scores for the different statements related to the affective components, perceived use, perceived control and behavioural components. The main results for the separate statements are given in Table 7.5.

Chi-square or Fisher's exact test was used to compare categorical variables between both groups. The questions were combined into groups 1–3 (disagree) and 4–5 (agree). Statements in Table 7.5 with reverse scoring are shaded.

The scores for each statement related to the various attitudinal components presented in Tables 7.6 and 7.7 were summed forming four computed variables, computed affective components, computed perceived use, computed perceived control and computed behavioural components.

Tables 7.6 and 7.7 show the computed variables for both groups.

Table 7.5 Statistical data for the 21 separate variables

No	Question	Description	Chi-square/ Fisher's exact
1	A1	Given the opportunity to use an e-module/Second Life as a learning tool, I am afraid that I might have trouble in navigating through it	0.009
2	U1	Learning using e-modules/Second Life helps me relax and thus do my work better	All disagree
3	C1	I could probably teach myself most of the things I need to know about accessing and learning using e-modules/Second Life	0.002
4	B1	I would avoid learning using e-modules/Second Life	0.613
5	A2	I hesitate to use an e-module/Second Life as a learning tool in case I look stupid	0.149
6	U2	Learning using e-modules/Second Life can enhance the learning experience to a degree which justifies the extra effort	0.492
7	C2	I am not in complete control when I use e-modules/Second Life for learning	0.012
8	A3	I don't feel uneasy about using e-modules/Second Life	0.004
9	C3	I can make the computer do what I want it to do while learning using e-modules/Second Life	$P < 0.0001$
10	B2	I would only use an e-module/Second Life for learning if I am told to	All disagree
11	C4	I need an experienced person nearby when I'm learning using an e-module/Second Life	0.105
12	A4	Learning using e-modules/Second Life does not scare me at all	0.468
13	U3	Most things that one can get from learning using e-modules/Second Life can be obtained or arrived at through other means	0.049
14	B3	I would avoid learning a topic if it involves an e-module/Second Life	0.075
15	C5	If I get problems using an e-module/Second Life, I can usually solve them one way or the other	$P < 0.0001$
16	A5	I hesitate to use an e-module/Second Life as a learning tool as I'm afraid of making mistakes I can't correct	0.024
17	U4	Learning using e-modules/Second Life provides more interesting and imaginative ways for learning	$P < 0.0001$
18	B4	I would access an e-module/Second Life regularly for learning	1.000
19	C6	I do not need somebody to tell me the best way to use an e-module/Second Life for learning	0.014
20	A6	Using an e-module/Second Life makes me feel uncomfortable	0.011
21	U5	E-modules/Second Life make(s) it possible to learn more productively	$P < 0.0001$

Table 7.6 Computed variables – Second Life group

	Second Life p-value	Median (IQR) (females)	Standard deviation (females)	Median (IQR) (males)	Standard deviation (males)
Computed affective variable	0.925	20 (18–23)	2.24	20.5 (19–23)	3.73
Computed components for perceived use	0.0751	14 (12–15)	1.91	11.5 (10.5–13)	1.94
Computed components for perceived control	0.2878	20 (19–21)	1.43	21 (18–22)	2.45
Computed behavioural components	0.6130	9 (6–10)	2.27	10 (8–10)	2.53

Table 7.7 Computed variables – e-module group

	e-module p-value	Median (IQR) (females)	Standard deviation (females)	Median (IQR) (males)	Standard deviation (males)
Computed affective variable	0.3038	22 (20–24)	1.79	23.5 (21.5–25)	2.08
Computed components for perceived use	0.6988	14 (13–16)	1.60	15.5 (13.5–16.5)	2.02
Computed components for perceived control	0.2739	17 (17–18)	0.786	17 (16–18)	1.78
Computed behavioural components	0.5472	8 (6–9)	1.79	7.5 (5–9)	1.99

Discussion is organised around the four major attitudinal components, and the statistical significance of some of the statements is discussed in relation to the pedagogical implications.

7.5.5 Attitudinal Components – Both Groups

7.5.5.1 Affective Component

The affective component addresses feelings of fear, hesitation and uneasiness experienced before and while learning in SL. Members of the e-module group were less apprehensive about accessing a virtual patient via e-module than the SL group, and felt more confident when using and navigating through an interactive linear virtual patient case (Q1: $P = 0.009$). Pedagogically, this might be due to the fact that the

virtual patient case is delivered in a linear way using an interface the students are used to.

Neither group is inhibited by beliefs arising from negative perceptions of looking stupid with others when accessing a virtual patient via e-module or in SL (Q5: $P = 0.149$). Learning in these environments is perceived by both groups as an intelligent and socially accepted activity. Therefore, game-based learning in SL should be promoted as a stimulating academic activity.

Regarding hesitation in the use of an e-module or SL (Q16: $P = 0.016$), it is interesting to note that the e-module group is 100% hesitant to use it thinking they can make mistakes they cannot correct, whereas the SL group is more confident in that respect (17/23, 73.91%).

It is interesting to see how the e-module group showed feelings of uneasiness when accessing the virtual patient case. These students have been exposed to the same interface during their current e-lecture programme, which normally is very well received by the students and very highly rated. It is worth pointing out that there are important instructional design differences when delivering interactive e-modules and when delivering virtual patients. Although the students like navigating through an e-module, they might find it difficult to navigate through a virtual patient case provided in a linear format. This is something worth exploring further in future research projects.

Both groups felt uneasy about learning in SL using game-based learning and e-modules (Q8: $P = 0.004$). Therefore, when building game-based learning in virtual worlds continual reinforcement and support should be given.

7.5.5.2 Perceived Usefulness

This involves behaviours arising from beliefs about the advantages of learning in SL or via e-modules. Regarding the therapeutic effect of learning via a specific platform, all participants in both groups disagreed that learning in SL or via e-modules relaxes them so that they could learn better. The SL group had never accessed SL before, and although a 20 min introductory session was provided at the beginning of the pilot, it was not enough for them to familiarise themselves with the environment. In relation to the e-module group, again this is something worth exploring further since interactive e-modules are normally very well received by the students. However, this is a linear virtual patient delivered as an e-module.

The SL group was more skeptical than the e-module group about the instructional potential of learning in SL, considering that other means (Q13: $P = 0.049$) provide what can be learned from game-based learning in SL. The SL group perceived learning in virtual worlds not as a unique learning and entertaining experience, but just as another way to learn.

It is interesting to note that both groups considered learning either in SL or via e-module as a way to enhance the learning experience to a degree that justifies the extra effort (Q6: $P = 0.492$). Such disposition should be exploited. Neither group agreed that learning either in SL or via e-module provides more interesting and imaginative ways for learning (Q17: $P < 0.0001$). During the focus group, the SL

group discussed the fact that the delivery of virtual patients via virtual worlds may replace contact with real patients, a situation that they found uncomfortable.

Regarding productivity (Q21: $P < 0.0001$), the SL group regarded learning in SL as a less efficient and effective learning experience.

7.5.5.3 Perceived Control

Perceived control refers to one's feelings and reactive behaviours while manipulating technological tools. This includes the ability to self-teach task-related skills, acquiring control over SL, and the degree of reliance on others' help to execute requested tasks.

The e-module group claimed more competence (Q15: $P = 0.002$). Activities for the SL group can be provided offering more guidance and support when facing problems. Regarding the sense of control when learning in SL (Q7: $P = 0.012$), the SL group felt much more in control of the virtual environment (15/23, 65.22%) and thus more capable of performing the demanded actions. However, more feedback and guidance should be provided to make sure learners accessing game-based learning activities feel in control at all times.

7.5.5.4 Behavioural Component

Positive behaviours are manifested as willingness to use SL for learning. Negative behaviours involve avoidance tendencies. Both groups declared that they do not avoid using SL or e-modules for learning (Q4: $P = 0.613$), therefore, showing their disposition to engage in learning using both environments. A group difference was obtained in relation to avoiding learning if it involves using SL or e-modules (Q14: $P = 0.075$). Interestingly, the e-module group was more in favor of avoiding using e-modules to learn about virtual patients (17/19, 89.47%) than the SL group (14/23, 60.87%). This shows a more favorable reaction towards using SL for learning.

Regarding their willingness to use SL or e-modules for learning if they are told to, both groups completely disagreed. When asked if they will continue to use SL or e-modules in the future (Q18: $P = 0.358$), both groups declared that they would not access virtual patients either in SL or via e-module regularly for learning. This could be explained again by the feedback received during the focus group in which the students were not in favor of accessing virtual patients and preferred direct contact with real patients when possible.

7.5.6 Attitudinal Components – Gender

7.5.6.1 Affective Component

Learning using these two different delivery modes is perceived by both sexes as an intelligent and socially accepted activity. Males, median 20.5 (interquartile range

(IQR) 19–23) and females, median 20 (IQR 18–23) show nearly the same median values and thus manifest an overall positive attitude for the affective component.

7.5.6.2 Perceived Usefulness

The SL group shows weak evidence of a difference in perceived usefulness between genders ($^{**}P = 0.0751$). Females show higher medians 14 (12–15), compared to males 11.5 (10.5–13), demonstrating a more-positive attitude overall for the perceived usefulness component. This involves behaviours arising from beliefs about the advantages of using SL for learning.

This is an interesting finding. Normally females are more skeptical than males about the instructional potential of game-based instructional models. Females generally perceive gaming not as a unique learning and entertaining experience, but as just another way to learn (Bonnanno and Kommers 2008). This disposition ought to be exploited by adopting and promoting game-based learning in virtual worlds.

7.5.6.3 Perceived Control

Perceived control refers to one's feelings and reactive behaviours while manipulating technological tools. This includes the ability to self-teach task-related skills, acquiring control over learning software, and the degree of reliance on others' help to execute requested tasks. There is no evidence of a difference in perceived control between genders ($P = 0.2878$). The medians for both genders are very similar: females 20 (IQR 19–21) and males 21 (IQR 18–22).

The SL group shows higher medians and thus a more-positive attitude overall for the perceived control component.

7.5.6.4 Behavioural Components

Positive behaviours are manifested as willingness to use SL or e-modules for learning. Negative behaviours involve avoidance tendencies. There is no difference in a behavioural attitude between genders ($P = 0.6130$). The medians for both genders are very similar: females 9 (IQR 6–10) and males 10 (IQR 8–10).

7.6 Conclusion and Recommendations

Learning in immersive worlds is beginning to have a wider range of uses and applications (De Freitas 2006). SL provides a space in which games can be created, and the infrastructure for the design of open-ended, game-based immersive 3D experiences.

The literature demonstrates that game-based learning shows some initial evidence of accelerating learning and supporting the development of higher-order cognitive and thinking skills (De Freitas and Jarvis 2007). The survey "attitude to learning in SL and via e-module" is a useful instrument from a pedagogical

perspective because it addresses attitudinal components. The survey findings have helped to identify key elements that should be looked at more carefully during the design of game-based learning. These initial findings have shown very little evidence of gender-related differences in attitude towards game-based learning for virtual patients in SL. Learning using this delivery mode is perceived by males and females as an enjoyable activity with actually females demonstrating a more positive attitude overall for the perceived usefulness component. These results are also in accordance with what other research on gender, computing and games has concluded. i.e., that old stereotypes of gender and computers as an exclusive masculine social space or a "boy's room" competence have little empirical evidence today.

General findings have driven the implementation of a series of changes in the original design, aiming to support learners under the different categories identified in the survey (affective component, perceived control, perceived usefulness and behavioural component).

Based on this evaluation and findings, the following general recommendations have been made and implemented in Phase II of this project:

- General feedback and guidance for cyclical content should be provided at all times for students accessing game-based activities for virtual patients in SL. Learners can now have access to the "Imperial College Badge" and the "HUD" or "Dashboard" (Fig. 7.7), which they can wear and by which they can receive feedback from the system. Feedback will be delivered to the learner if they have not carried out any activity for the last 5 min. The feedback will inform the learner about the patient they last treated and the last activity carried out on that patient. The HUD plays a very important role displaying rewards and schedules information.
- "Demanded feedback" for cyclical content has also been implemented. A "Virtual Patient Panel" (Fig. 7.8), has been provided, located by the patient's area. The student can click on a "Check Status" sign and receive feedback on where they were left last time they accessed the patient.
- The virtual patient panel also offers a "Reset" option which the students can access to reset the virtual patient activity in case they want to start all over again and therefore have more control over the activity.
- The virtual patient areas have been redesigned to be as spacious as possible in order to accommodate several avatars accessing the virtual patients at the same time.
- It is suggested that individual feedback is restricted to notecards or individual text messages in order to avoid congestion of the general chat text window and thus reduce confusion among the students.
- More guidance has been provided within the messages delivered when learners are not doing the right thing.
- It is worth pointing out that although a high percentage of the students in the SL group were high gamers they still found problems navigating in SL. It is important to keep in mind that the interface offered in SL is unique. The traditional navigational functions offered in current web browsers are very different from the ones available in SL. Therefore, it is recommended to make sure the students

Fig. 7.7 Imperial College London badge and HUD

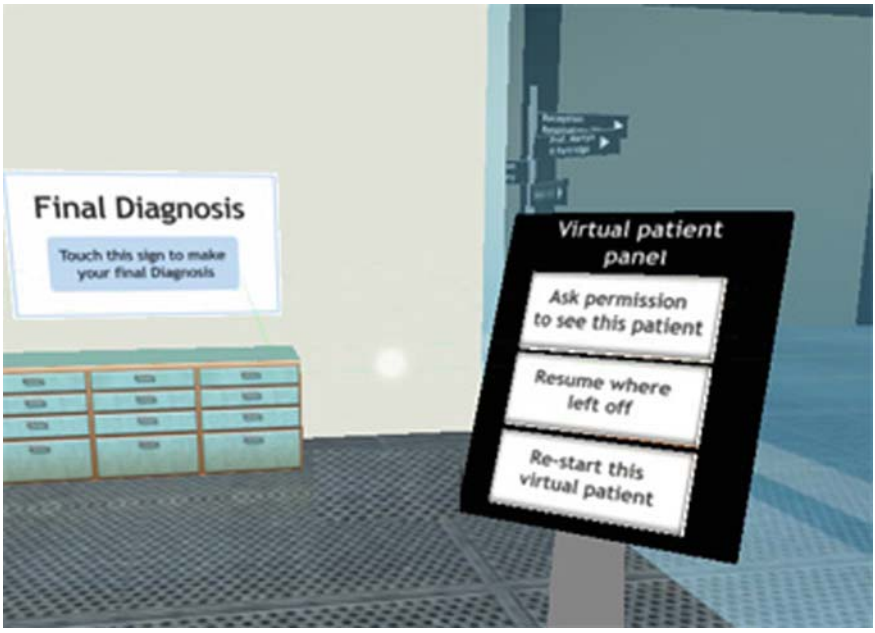

Fig. 7.8 Virtual patient panel

are exposed to SL for at least 4 hours before engaging in any learning activity in this environment.

It is important to highlight the fact that following the four-dimensional framework and technical development processes discussed in this paper has helped implementation of the learning outcomes originally proposed for the delivery of game-based learning for virtual patients in the area of respiratory medicine. The pilot carried out has been extremely important in the evaluation of students' attitudes towards learning using this delivery mode. The feedback received has informed the development of Phase II, which incorporates a multi-patient approach: five virtual patients suffering from different respiratory problems, such as asthma and chronic obstructive pulmonary disease (COPD), were implemented during Phase II. The same narrative and activity model is applied to all these patients, including different modes of representation.

The three-tier architecture model has provided a consistent and reliable architecture for the implementation of game-based learning activities in SL. Activity information is stored efficiently, and user-friendly reports are generated. Virtual patients' activities can be easily redesigned following the architecture implemented.

The implementation of this game-based learning approach has provided a clear example of the potential of virtual worlds in the delivery of engaging game-based activities. As Sauvé et al. (2007) explains it is critical to identify essential elements in the game experience as well as the five attributes that cover the concept of "game": players, conflict, rules, predetermined goal of game, and its artificial nature. The Pedagogic Framework developed by De Freitas and Martin applied in this research drove the detailed implementation of the five attributes described above.

There was great enthusiasm in the 1980s from educators to incorporate guidelines about designing engaging environments, most of which has become incorporated into student learning environments (Jonassen and Land 2000). Since then, gaming technology has improved considerably, but very little has been done to study how these improvements might be incorporated into learning environments (Squire 2003). The application of game-based learning principles could be used by educators as a model for improving virtual worlds, by providing clear goals, challenging students, allowing for collaboration, using criterion based assessments, giving students more control over the learning process and incorporating novelty into the environment (Bowman 1982).

The design methodology implemented in this work has proved to be pedagogically sound following a systematic approach. It is recommended for any future attempt in designing game-based learning activities in virtual worlds to follow a similar approach. The dynamics behind these design considerations might be useful for learning technologists who are usually leading the design of interactive digital learning environments. It is worth pointing out that further analysis has to be carried out in order to continue evaluating attitudes towards game-based learning within virtual worlds. It is also important to bear in mind that the research project

is still ongoing and the findings highlighted above form part of a larger research project.

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Chapter 8
Learning and Teaching in Virtual Worlds: Boundaries, Challenges and Opportunities

Liz Thackray, Judith Good, and Katherine Howland

Abstract As evidenced by this book, the use of virtual worlds for teaching and learning is attracting increasing attention. Many universities have a virtual presence in environments such as Second Life™ (SL), but there is little guidance to educators on how to best make use of the affordances of virtual worlds. In this chapter, we use our own practical experiences of developing learning experiences in SL as a base from which to examine the boundaries, challenges and opportunities that may be confronted in moving into teaching and learning in the virtual world. We use the "Diffusion of Innovation" model and its extensions to educational contexts both to analyse our experience and to consider the challenges facing later adopters of the technology. Our analysis suggests that students and staff and staff from different institutional settings have different profiles in terms of their attitude to risk, and their focus on learning products or process. Part of the learning experience involves helping students become aware of these characteristics, and allowing them to experiment with situations of greater risk. Finally, we identify a number of areas where improvements in the technology are needed in order to make it more welcoming to more risk averse users and to enable more flexible use of resources.

8.1 Introduction

Virtual worlds have gained a great deal of attention in the education community in recent years. The 3-D nature of virtual worlds enables activities and interactions that are not possible in 2-D virtual environments, and may provide a platform for activities which are not easily accommodated in normal classroom environments. Our particular focus has been on teaching aspects of subjects which might be considered difficult, dangerous, or even impossible to teach in the physical world for various reasons.

Although there is evidence of virtual worlds being used for educational and research purposes in almost all UK higher education institutions (Kirriemuir 2009),

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it is also evident that this represents a minority of educators, classes and projects. If the mainstream of higher education is to adopt and use virtual worlds more fully in teaching and learning, there are a number of obstacles to be confronted and overcome. In this chapter, we examine the barriers to innovation in virtual world teaching, drawing both on our experience of working in Second Life™ (SL) and on those identified by Warburton (2008, 2009). We recognise that some of the obstacles are part of the infrastructure of virtual worlds, while others present opportunities to practitioners in adopting new approaches to working with learners.

We revisit the diffusion of innovation model first published by Rogers in 1962 (Rogers 2003) – sometimes referred to as the adoption of technology cycle – and following Jennings and Collins (2008) we consider the application of this model to virtual world learning and teaching. There are variations in approaches to university level education which are determined by institution, discipline and the experience of individual instructors, and these differences influence the approach taken by educators in adopting new methodologies and approaches to learning and teaching.

At the present time, there is no primer for how to teach in a virtual world. Some case studies have been undertaken in Active Worlds (Dickey 2003, 2005; Prasolova-Førland 2004; Prasolova-Førland and Divitini 2003; Prasolova-Førland et al. 2005) which have suggested ways of "physically" designing a virtual world environment, but they have not addressed instructional design issues. Cheal (2007) has suggested that teaching and learning in virtual worlds is the next step in the evolution of instructional design, describing the timeline from the 1960s to the present, but again having little to say about the "how" of teaching in a virtual world.

In recent years, there has been an increasing interest in the potential of SL, with many educators beginning to explore the affordances of the virtual world. However, there is little practical guidance apart from that offered by Ryan (2008) and the growing number of case studies presented at recent conferences and workshops held both inworld and in the physical world, including ReLIVE 08, and through the SL educators list, commonly known as the SLED list. There is an awareness that we are on a journey of discovery and that journey involves utilizing knowledge and experience gained from the general body of learning theories and from other classroom experiences. It is also a journey where the unknown is confronted, risks are taken and new approaches are developed which may or may not be linked to previous knowledge and experience. Although this may suggest the need for the development of a new pedagogy (Savin-Baden 2008), such a development is beyond the scope of this chapter.

Not only are virtual worlds unfamiliar territory for instructors, students are also being asked to engage in a new learning experience which may present unexpected challenges and involve a degree of risk taking. Here also the diffusion of innovation model (Rogers 2003) has been useful in examining how students responded to learning in a virtual world.

In our analysis, we will consider the boundary issues encountered in a university level course which we taught, and which used SL, and the obstacles to educators moving into virtual worlds identified by Warburton (2008). Consideration will be given to Moore's chasm (Moore 2002), an extension of Rogers' adoption

of technology model, and to Geoghegan's (1994) application of these models to instructional technology. Jennings and Collins (2008) have suggested these models are useful in determining the physical design of SL environments and we will extend this to suggest that an understanding of these models is necessary in order to recognize and overcome the challenges, obstacles and boundaries to learning and teaching in a virtual world.

8.2 The Setting

The setting for the work described in this chapter was a university level course entitled Interactive Learning Environments (ILE), which has been running for a number of years at the University of Sussex. It is a 10 week long course that introduces students to a number of learning theories and technologies for supporting learning and teaching. In 2008 and 2009 students were required to work in teams and develop interactive learning experiences within SL.

In both presentations, students were given projects which had physical world relevance, and the potential to be taken up and used in an educational setting. The course was taught by a small team, bringing together expertise from the Sussex Learning Network (SLN) and the Open University as well as experienced instructors from the University of Sussex, and facilitators from InQbate, the Centre for Excellence in Teaching and Learning (CETL) in Creativity. In 2008, advantage was taken of the trend in recent years in UK education to place an emphasis on vocational learning. The partner institutions of the SLN were approached and asked to identify areas of their teaching which were difficult, dangerous, or impossible to teach adequately in a classroom setting. This resulted in eight projects with foci as diverse as mental health assessment, child protection issues, numeracy for nurses, drug search procedures for police officers and elements of systems theory. A problem based learning approach was adopted, as described in Good et al. (2008). In 2009, in order to disseminate awareness of the affordances of SL, project suggestions were invited from colleagues across the campus at the University of Sussex.

We had three purposes in mind in choosing to work in SL:

- We wanted to explore the affordances of SL and, in particular, whether it was possible to do things that were innovative rather than replicating physical world educational experiences.
- We needed a platform where students could demonstrate their understanding of the theoretical aspects of the course and create learning experiences using this understanding.
- We wanted to offer students an opportunity to develop skills which would be of value to them in the physical world, in particular working for a real client.

Adopting the phrase "difficult, dangerous or impossible" enabled us to clarify with potential clients that we were looking for projects which would not simply recreate classroom experiences, but would provide the students with an opportunity

to use the affordances of the virtual world. “Difficult” described learning experiences which either presented learners with challenges in understanding unfamiliar ideas, sometimes known as threshold concepts (Meyer and Land 2005) or troublesome knowledge, or were difficult in the sense of being hard to adequately teach in a classroom. Trainee police officers can practice drug searches on each other but factors such as the embarrassment of searching a fellow student and the knowledge that a “drug” has definitely been planted on the person being searched prevent these classroom simulations from attaining any degree of realism. “Dangerous” implies risk. Trainee social workers can accompany experienced colleagues undertaking mental health assessments, but the presence of an inexperienced person in an already volatile situation may add an extra risk factor, making it difficult to offer this experience to trainees. “Impossible” covers a range of activities which cannot be carried out in physical world classrooms for various reasons. For ILE students this has included looking at how molecular bonding might be modelled, and providing training in measuring heat emission from listed buildings. In addition, many of the simulation projects being developed in other institutions around health, social care and disaster response, some of which are described elsewhere in this book, are similarly impossible to undertake in the physical world except under exceptional circumstances.

In both presentations, students were provided with information on how to register an avatar and how to keep themselves safe in the virtual world, and went through the orientation process provided by Linden Labs. A basic building course was provided in the second week of the course, and students were provided with information about inworld resources to support building and scripting. Additionally in 2009, students viewed machinimas created by the previous year’s cohort during the first session of the course.

The course was supported by weekly lecture/workshop sessions, group consultations and staff presence in SL. There was a course website, hosted on Moodle, with background reading and other support materials. In 2009, the course was able to use the facilities of the InQbate Creativity Zone, a flexible and interactive learning and teaching space designed for workshop type activities, permitting students a range of hands on learning experiences. In 2008, we found students had difficulty arranging project meetings, so an extra hour of class time was timetabled each week in ILE 09 for group members to meet and work together and to consult with the teaching staff. Our own increased understanding of SL meant more use was made of virtual world resources in the workshop sessions in 2009, including providing landmarks to students relevant to their projects.

During the early part of the course, students formed themselves into project teams. Each team had the opportunity to interview the client for their project either face-to-face or using telephone conferencing or Skype. Following the interviews, students drafted initial project specifications and received feedback on these from each member of the staff team. Whereas in 2008 students had little or no ongoing contact with their clients, who were based in other institutions, in 2009 students were able to seek advice and comments from their campus-based clients as the projects developed.

In both years, the course assessment had three aspects; the creation of an interactive learning experience in SL meeting client specifications, preparation of a machinima describing the project, to be presented to the student cohort and clients, and the preparation of a document on the process of developing the learning experience including theoretical reflections.

8.3 Boundaries, Challenges and Opportunities

During the planning for ILE 2008, it became clear that we would be confronted by a number of potentially complex organizational and logistical issues. Each of these presented both challenges and opportunities. ILE 2008 was an established course in an institution with a strong academic reputation. When deciding to base the course in SL, the decision was taken to include a consultant from another institution, with previous experience of teaching in SL, who was more familiar with working with distance students from less traditional backgrounds. The decision to seek clients who were teaching vocational higher education courses in other institutions necessitated crossing institutional boundaries. However, it was only when we began to work with our colleagues, both within the ILE 2008 staff team and from the other institutions, that we realised the extent to which we were not only crossing institutional boundaries, but that amongst us there were some very different approaches to learning, curriculum development and assessment, perhaps not surprising in retrospect as we represented different academic tribes (Becher and Trowler 2001).

In addition to institutional, curricular and professional boundary issues, we encountered a number of challenges and opportunities related to working within the SL environment. Our students were engaged in developing learning experiences, but we were engaged in a learning experience ourselves.

The challenges and boundary issues we identified in ILE 2008 related to identity and role, risk assessment, knowledge, organizational culture, economics and blended learning. Warburton (2008) initially identified six barriers to innovation in virtual world based learning and teaching: technical, identity, culture, collaboration, time and economics to which he later added creativity. Identity, culture and economics find a place in both lists and we include technical within risk assessment. In our discussion we include aspects of collaboration within blended learning and knowledge, and consider time and economics together. We do not discuss creativity.

A further potential barrier was identified on a recent conference call for papers:

> Modern virtual worlds are seen from an optimistic viewpoint as a disruptive and transformative technology. However, it still remains unclear to some extent where the real benefits and limitations of using virtual worlds as knowledge transfer and learning environments are when compared to more traditional methods (ViWo 2008).

We do not explore this further in this chapter, but recognise that not being sure what virtual worlds offer in an education setting is a real disincentive for many educators to exploring the potential of virtual worlds for themselves. There is work beginning to appear, including a number of the chapters in this volume, which

increases our understanding of the pedagogical affordances of virtual worlds and challenges us to develop new approaches to teaching and learning in these environments (e.g. Savin-Baden 2008) and this should begin to address this potential obstacle.

Before discussing our experience of boundaries, obstacles and opportunities, we turn to Rogers and the diffusion of innovations/adoption of technology model.

8.4 The Diffusion of Innovation Model and Its Applications to Education

In designing the course, we were mindful of a number of different learning theories underpinning our planning, including constructionism (Papert 1991), problem based learning (Savin-Baden 2007; Savin-Baden and Major 2004) and threshold concepts (Meyer and Land 2006). We have reflected on ILE as a case study in problem-based learning (Good et al. 2008) and have plans to explore further the contribution of learning and teaching in the virtual world to threshold concepts and troublesome learning.

In considering boundary issues, we have found Rogers' (2003) diffusion of innovation/adoption of technology model helpful, together with the extensions to this model offered by Geoghegan (1994) and Moore (2002). Rogers suggested that individuals will adopt new technologies or innovations at different rates, dependent upon their social and psychological characteristics. He identified five categories of adopters along a continuum, namely innovators (2.5% of the population), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%).

Geoghegan applied these categories to educators as follows:

- Innovators ("techies"): individuals who are interested in the technology itself and understand the hardware and software requirements;
- Early Adopters ("visionaries"): individuals who explore new technologies as a way of expanding the range of available methods of teaching effectiveness; they are risk-takers who apply an interdisciplinary approach to teaching, learning and research; they tend to be horizontally connected with a network drawn from many disciplines.
- Early Majority ("pragmatists"): individuals who tend to be reasonably comfortable with technology, but are more interested in the day-to-day business of teaching and research than in exploring new technological tools. They listen to the success stories of colleagues and are willing to adopt tools which have been shown to be useful. Generally pragmatists are more risk-averse, less likely to cross disciplinary boundaries and tend to be vertically connected within their own specialism.
- Late Majority ("sceptical"): educators who adopt well-established technologies, which come as complete packages with support. They tend to have little interest in technology and expect it to work or they reject it.
- Laggards: these may be considered the Luddites of instructional technology and are unlikely to adopt technology, except under pressure.

Moore (2002) suggested there is a chasm between early adopters and the early majority, and how and whether this chasm is bridged determines whether or not a technology moves into the mainstream. Although Rogers challenges the concept of the chasm, he agrees with Geoghegan and Moore that there are distinct differences between the visionary early adopters and the more pragmatic early majority. We identified some of these characteristic differences in ourselves and the students and clients we worked with in the ILE course.

Jennings and Collins (2008, p 181) draw attention to "striking differences" between the early majority and early adopters, not only in their approach to adopting new technologies, but in their relationships across disciplines. They suggest that both the early adopters and their innovations should be examined in order to discover those aspects of developments in the virtual world that may appeal to the early majority especially in the context of the expectation of increasing mainstream adoption of virtual worlds. They suggest SL is not yet mainstream, and this is a time of challenge as to whether it, and other virtual worlds, cross the chasm to become mainstream educational activities.

Looking at the characteristics of the different groups as described by Geoghegan, we would suggest that in the learning and teaching context of virtual worlds at the present time, instructors are more likely to be characterized as early adopters and students as early majority, but there is scope for movement between the groups, suggesting the existence of a continuum rather than a chasm. This is discussed further later in this chapter.

At present, there is reportedly only one HE institution in the UK where there is no evidence of any virtual world usage (Kirriemuir 2009). However, this represents active use of virtual world environments for teaching or research by a very small number of staff in each institution. It is likely that less than 1% of educators in HE in the UK are currently using 3-D virtual worlds and it could be argued that those who are innovators rather than early adopters. On the other hand, in answer to the question "Under what circumstances would it become appropriate for virtual worlds to become a resource for mainstream education rather than the preserve of the enthusiast?", Claudia L'Amoreaux (aka Claudia Linden) expressed the view that whereas in 2005/2006 educators involved in SL were early adopters, in 2008 SL was part of the mainstream (Peachey et al. 2008).

Viewing instructors as early adopters and students as early majority probably has less to do with overall comfort with virtual worlds, and more to do with issues of control. Students may be very "au fait" with virtual worlds and other such technology-based innovations, but, unlike their teachers, are rarely in a position to implement changes in a formal teaching and learning context. In other areas of their lives they may well be the innovators and early adopters.

8.5 Boundaries, Challenges and Opportunities

This section focuses on the boundary issues we identified in ILE, relating these to Warburton's (2009) identification and discussion of barriers to deploying virtual worlds in learning and teaching and to other published work. We incorporate

discussion of the actions taken in ILE 2009 to mitigate some of the issues we encountered during the previous course presentation.

8.5.1 Identity and Role

Identity is an issue which we recognise, in much the same way as Warburton (2008), as being potentially problematic in teaching and learning in all virtual worlds. It has been explored in some detail by Bayne (2008) and Peachey (in press). In this section we focus more on the changing and evolving role of teacher and student in virtual worlds as also discussed by Savin-Baden (2008).

In most education settings, the role of the teacher and the role of the learner are clearly understood. Although teachers will frequently learn from their students, they are regarded as having some knowledge and expertise, which they impart in various ways. Teaching often takes place in formal settings designed for the purpose, such as classrooms and lecture theatres. Students are able to consult with their teachers at predetermined times. Although there has been a move from the teacher being seen as the fount of knowledge, sometimes pictured as pouring knowledge into the mind of the learner, to a recognition that a teacher is an enabler of learning who can facilitate the acquisition of knowledge and understanding, there is still a role differentiation. Warburton identifies in virtual world education a tension between playfulness and professionalism which we experienced in both ILE courses.

In ILE 2008, the usual rules of staff student interaction were challenged. Although the staff team had some prior experience of exploring SL, none of them claimed to be experts in that environment. They were able to offer students pointers to resources to enable them to explore and familiarise themselves with the virtual world, but rarely were they able to suggest solutions to students' building and scripting dilemmas. The instructors were no longer the experts with domain knowledge, but were fellow learners with the students within the virtual world.

Much of the interaction between students and instructors took place in the virtual world. Some of these interactions were by appointment or during inworld office hours, but many took the form of chance encounters, or were initiated by the students. For example, a student noticing a member of staff was inworld might offer a teleport to their location so that they could discuss the building activity in which they were currently engaged. Similarly, members of staff spent time in the location students were working in and would engage in conversation about project progress. As well as these project focused discussions, on occasions staff found themselves simply chatting with students while sitting in treehouses and other unlikely places. Similar observations have been made of student responses in earlier virtual world based courses (Prasolova-Førland and Divitini 2003).

Students too were aware of this difference in communication patterns in the virtual world:

> It was excellent chatting with you inworld; thank you so much for making me feel welcome, and for your advice. It's actually a really weird feeling talking to lecturing staff inside SL; the social dynamics are completely different.[1]

Teaching staff who might normally pass students in the corridor without more than minor acknowledgement, found in SL they felt it was inappropriate not to acknowledge students who were inworld and to engage in brief conversations.

Students quickly learned to use sources of expertise available in the virtual environment. Mainly they drew on resources established for the purpose, such as the building tutorials available in the Ivory Tower Library of Primitives and the scripting advice available on the SL Linden Scripting Language wiki in much the same way as they might use library or Internet resources in the physical world. Some students found that approaching other SL residents was helpful in finding solutions to technical problems. On one memorable occasion, members of one group were offered considerable support by a lecturer from another institution who then provided them with roller skates – they said in recognition of the work they had done, but possibly to offer them a distraction so she could get on with other tasks. From then on, those students were rarely seen in SL without skates. At times, the experience was surreal, and reminiscent of the uncanny spaces described by Bayne (2008). There was a very real inter-mingling of playing and learning.

As the teaching team's familiarity with SL increased, the emphasis was still on students finding their own solutions to problems they encountered in SL, but teachers were able to offer more practical support. Although there was still a real sense of both students and instructors learning together, there was no longer quite the same sense of both starting the journey from the same place. Judy Robertson, in her presentation at CAL09, referred to this phenomenon when describing herself as the "lead learner", an expression which is being used increasingly in schools and which perhaps should be adopted also in HE.

8.5.2 Risk Assessment

The first presentation of any new or revamped course carries with it a degree of risk. In general, this risk is mitigated by the experience of teaching staff and the ability to change elements of the course in response to student need. It is usually possible to identify in advance the parts of the course which are likely to be problematic.

ILE 2008 had a number of potential risks, some of which could apply to any innovation. The course was using a virtual environment, with which neither staff nor students were fully conversant. The staff team had not worked together as a team before and did not know each other's strengths and weaknesses. It was uncertain whether SLN partner institutions would be able to offer projects appropriate to the

[1] Personal communication, 16 January 2009

course. Students were being asked to work in teams with an external client, develop a learning experience within SL, create a machinima and present the outcome of their work within a 10 week timeframe.

The virtual environment of SL presented its own risks, both personal and technical. From a technical perspective, there was a need to ensure that access to SL would be available on the University network, that the SL software would run on University computers and that software updates would be installed as needed. There was uncertainty about the stability of the SL platform, and how downtime might affect the work of students. Though there are very few occasions when it is impossible to use the virtual world, SL is still subject to periodic software upgrades and rolling restarts. This has to be considered in lesson planning and may make use of a virtual world too difficult for the risk averse. Warburton (2008) draws attention to the wider technical aspects of working in virtual worlds, raising the issue of standards and inter-operability between virtual worlds.

Students needed to be made aware of some of the risks inherent within the virtual environment. The staff team discussed at length how we might appropriately fulfil our duty of care to the students. Although it could be argued that, as a rule, we are unaware of what students do in their lives outside the classroom, it is also true that we do not ask them to take part in any particular activities which would lead them into personally risky situations. In asking students to engage in activities in SL, we were aware that they might encounter experiences in the virtual world which could be embarrassing, challenging or threatening. The written material introducing students to the course alerted them to risks inherent in SL and suggested strategies for avoiding, or if necessary escaping from, situations where they felt vulnerable or at risk. Although it can be argued that virtual worlds are pixels on a screen, there is much evidence to show that people identify with their avatars, and have immersive experiences within virtual worlds that affect them personally (Bardzell and Odom 2008; Dibbell 1993; Peachey in press).

In 2008 no concerns were raised by any of the students, however the picture was a little different in 2009 when one student became a very active user of SL and at the end of term presentation spoke of the potential problem for some students of becoming “addicted” to the environment. Similar discussions have taken place on the SLED list from time to time, generally emanating from management concerns fed by media interest in the seedier aspect of virtual worlds. The consensus of opinion has been that very few students become over-involved in the virtual world. Nevertheless the extent of educator responsibility for what students do in a virtual world is open to discussion, even though it is not possible to justify the type of control exercised on Teen SL where students registered to a project are not permitted to leave the island on which their project is based.

A real concern voiced by students related to the potential risk of failing to create an appropriate SL learning experience, and the effect this might have on their course mark and hence their degree classification. In mitigating the risk, our main concern was to ensure that the students knew that we were asking them to engage in a high-risk project, and to make them aware that the assessment criteria were not dependent on successfully creating a solution to their client’s problem within the SL environment, but on their reflections on the process and outcomes.

8.5.3 Organisational Culture

One of our aims in setting ILE in SL was to explore the affordances of the virtual environment as a learning and teaching platform. Our observations of the virtual environment suggested that much existing learning and teaching activity within SL mirrored physical world classroom activity. We were aware of many replica classrooms and lecture theatres, and had observed, or participated in, learning activities that mirrored physical tutorials or seminars. Although we knew there were educators seeking to push the boundaries in SL, we were interested in how students would approach the environment. Our hope was that they would be less encumbered by the baggage of teaching experience we carried, and might be free to engage in more innovative activity than professional educators, using more fully the possibilities offered by the virtual world.

We designed the course around a problem based approach (Good et al. 2008; Savin-Baden and Major 2004). Our aim was to give the ILE students a problem scenario as provided by the client and a blank canvas in the form of the SL environment, and provide support as requested by the students as they began to explore the possibilities offered by SL. It quickly became clear that not all of our clients were happy with giving the students this amount of freedom to decide what they would do. This appeared to stem from the employment oriented ethos of vocational education, where there is considerable emphasis on skills development and preparation for work. Although we had emphasised to our clients that we wished them to present our students with a problem scenario only, some found it difficult not to present possible solutions. While our emphasis was on the students' learning *process* – and we told the students that it was possible they might not find appropriate solutions to some of the problems they were presented with – many of our clients placed an emphasis on *product*, and sometimes had very clear ideas about what they expected students to build for them. This led to frustration for both students and instructors, and involved the ILE team in troubleshooting between the students and clients.

In 2009, the clients were drawn from the University of Sussex, not so much to address the problems of the previous presentation as to disseminate our experience of working in virtual worlds among colleagues. However, it also provided an opportunity for students to work more closely with their clients, sharing work in progress and receiving feedback during the development process. It would be true to say there was less evidence of academic tribalism (Becher and Trowler 2001) in the second presentation of the course. We account for this by suggesting that there was a greater similarity in pedagogic approaches with our colleagues on campus than those from other institutions, but the numbers involved are too small to draw any conclusions.

A further dimension to crossing institutional boundaries was found within the ILE staff team itself. Although we shared a similar vision for ILE 2008, there was a need to clarify differences in institutional practice and expectations. For example, marking scales were markedly different with the bar at 70 for a first class pass in one institution and at 85 in another. Although the expectations were similar, the quantitative measure of those expectations was very different.

Warburton (2008) draws attention to the cultural issues presented by the virtual world itself. As made very clear by both Meadows (2008) and Boellstorff (2008), SL is a real place with many different communities living side by side, each with its own codes and etiquette. An ongoing debate is the extent to which immersion in the virtual world is necessary for engaging in educational activities. In the ILE courses, we made use of the affordances of the virtual world but, beyond the course requirements, left the level of involvement in SL up to the students themselves. Whether a more immersive experience, making greater use of SL for course delivery, would have affected either the learning process or outcomes is an open question.

8.5.4 Blended Learning

ILE 2008 was delivered in a traditional face-to-face classroom. Classes were timetabled on a weekly basis and took the form of workshops integrating a broad range of approaches to teaching and learning from mini-lectures and presentations, to exploring different interactive learning environments, to presentations from inworld speakers, to video conferencing with instructors from other institutions, to meeting students inworld from other projects and sharing experiences. The use of the InQbate Creativity Zone, Fig. 8.1, in 2009 provided a more flexible space, but the course content was broadly equivalent.

Students met each other in class and some of the group work took place in face-to-face meetings on campus. A Moodle site supported the course, with links to

Fig. 8.1 2009 cohort learning in the InQbate Creativity Zone

readings and other resources. Each project group was given a wiki, and encouraged to use it for collaboration and resource sharing. In 2009 additional inworld resources were provided using notecards and landmarks.

Some aspects of the course were delivered online, primarily the building tutorials which took place in SL. Use was made of videoconferencing in a variety of ways: some of the client interviews took place using videoconferencing or Skype, one of the staff team attended some of the classroom discussions using a video link, and the staff team communicated regularly using Skype and e-mail with minimal face-to-face contact. Without the casual interaction that might occur "around the water cooler", members of the staff team had to rely on the skills each member of the team brought to the project and a high level of trust quickly developed, which was reinforced by using the available communication channels and engaging in email conversations.

As has been described, there were many encounters of teaching staff and students inworld, permitting opportunities to provide information or suggestions on how a project might be developed. However, apart from specifically timetabled inworld sessions, there was little use of SL for actual teaching. Neither was SL used for exploratory activities such as for quests or other specific activities relevant to the course. Although notecards were prepared of places to visit relevant to taught topics, there is little evidence that students visited these places except where they were of direct relevance to their projects.

8.5.5 Time and Economics

Economics and time present very real challenges to many educators considering engaging in teaching activities in a virtual world.

The initial cost of entering the SL virtual world is low. It is possible to register a basic SL account without cost. Although buying land is not necessarily a major expense with the educational discounts made available by Linden Labs, the ongoing maintenance costs are an obstacle (unless the institution can be persuaded of the case for being involved in developing learning and teaching activities in a virtual world, and to be willing to commit to doing so in a sustained manner). An alternative to purchasing land can be renting or borrowing a piece of land from another institution, and this was our choice in 2008. However, even if the costs of purchasing and maintaining land can be met, the real costs of working in SL are often hidden. In order to create anything meaningful demands a considerable expenditure of time. Even creating a small item like a notice board is time consuming. Not only does the notice board have to be constructed, a texture has to be prepared in an appropriate size and format using different software and imported into the virtual world where the texture has to be applied to the notice board. Once made, the notice board needs to be given appropriate permissions, named and placed where it will be seen. Other more complex builds are that much more time consuming to create and demand a range of building, scripting and land management skills which can only be learned by spending a considerable amount of time practising in SL.

As very few educators have time available or allocated for developing an island, unless they have money available to pay students or consultants to create the buildings, the only way to create the learning environment is to spend time inworld on a voluntary basis. As Twining and Footring describe in Chapter 4 where they discuss the Schome Project, volunteer staff do not come free, but demand time, training and support. There are some virtual world projects that have been the recipients of major funding, such as that described by Toro-Troconis and her colleagues in the previous chapter, but these are exceptions rather than the rule.

It is true to say that time and finance are two major obstacles still to be overcome if virtual worlds are to be sustainable and become mainstream educational resources. It may be that educators from different institutions can support each other in skill sharing, and even in providing artefacts for use in new educational developments. There are signs of such self-help initiatives developing within the SLED community.

There are also conflicting advantages and disadvantages of owning land compared to using land belonging to others. In practical terms, by providing a dedicated island on which to build the learning experiences, students in 2009 became more involved in an ongoing community of practice, as the project teams worked side by side and were able to draw inspiration from each other. Furthermore, by making available the previous cohort's work (both the learning experiences themselves, which were housed on the island, and the machinima), students joined a virtual and sustained community of practice, and were able to better situate their developing projects with respect to finished work, Fig. 8.2. However the flip side was that in 2008, students gained a wider experience of SL through having to use land

Fig. 8.2 Student engaged in creating part of a learning experience in SL

belonging to other institutions and public sandboxes for developing their projects. Given that our aim was for students to undertake practical work that related to the taught elements of the course, owning land was the better solution. Using the land of others would be more appropriate if our aim had concerned familiarisation with and use of SL more generally.

8.6 Application of the Diffusion of Innovation Model to ILE

As researchers and educators, the staff team of ILE 2008 could be considered early adopters of SL. Within the team there was considerable general technical expertise, a willingness to take risks, and an active interest in exploring the affordances of SL. Although there was an awareness of some of the potential risks before engaging in ILE, there was also a willingness to mitigate these in whatever way possible. We were interested in experimenting and learning from the experience in developing future courses. It was our enthusiasm for the project which helped to persuade our clients to identify projects they could offer for students to develop.

Although there was some evidence from students on previous ILE courses that they wished to work with cutting edge technologies, in general, the student group was risk averse and focused on results. There was considerable anxiety in both cohorts at the start of the course about what they were being asked to do in a short time period. In many ways, this was understandable, given the particular stage in the students' learning journeys, and the general ethos of a need to be a high achiever which often accompanies learning in higher education. However, as learners, they were interested in new knowledge and acquiring new skills, provided sufficient support was given. In essence, although their risk-averse stance was understandable, as a staff team, we aimed to overcome this by limiting the negative consequences that can be associated with risk taking, and by encouraging students to explore creative solutions which necessitated a degree of risk taking and challenged personal boundaries. That this approach was successful with some students is evidenced by one student's comment on the course evaluation questionnaire:

> It has opened new doors to an entirely different field of computing, which is very interesting, and the course has made me realize that there is so much potential out there to do anything you can think of!

The project clients for ILE 2008 were educators who would not have considered adopting SL as a learning and teaching environment on their own, but who were interested in knowing more about what SL might offer them as long as they themselves were not asked to take any risks. They would probably categorize themselves as firmly in the mainstream and probably members of the late majority. As a result of seeing the outcome of the student projects, some of the clients expressed an interest in developing and using the projects with their students. Whether they would want to take a step further and initiate their own virtual world projects is an open question.

The ILE 2009 clients were recruited from within the University of Sussex and in exploratory discussions the course team made it clear they were looking for projects that not only lent themselves to development in SL, but which it might be possible to test with the students for whom they were built. The clients were recruited not just because they had an appropriate project, but because they already had ideas about how the SL learning experience might become part of their teaching toolkit. At the time of writing, the ILE 2009 course has just finished, and there are already encouraging signs that the work developed by the ILE students may be used in other classrooms.

Table 8.1 shows the initial stance of each of the groups involved in the ILE courses and it is noteworthy that clients from 2009 differed from 2008 in that they appeared to have a broader understanding of virtual worlds, but were open to letting the students explore solutions to problems posed, rather than focusing on a particular outcome that they wished to have. They were more excited about the potential of SL and more actively wanting to incorporate it within their teaching. However, this probably says more about changes in our recruitment strategy between the two presentations than the institutions from which the clients were recruited.

Geoghegan's (1994) model provides a useful framework in embarking on any learning activity with a substantial use of technology. Understanding that different participants are individually at different places on the adoption of technology continuum, and may be in different positions in the different roles that they occupy, makes it possible to begin to identify and address concerns. The recognition that a student who might be an "innovator" or "early adopter" in their personal approach to technology can be far more cautious when engaged in an assessed learning experience is an indicator to educators to clarify the purpose of the learning activity. This awareness extends beyond virtual worlds to other aspects of using technology in learning and teaching.

If there is a product focus, for example, learning how to use a piece of software in order to produce a specified product, then it is necessary to overcome the anxiety and focus on the task and the product. If, on the other hand, the learning experience is more about exploring, experimenting and discovering what might be possible, then the focus is on the learning process and the student's own developing

Table 8.1 Comparison of the characteristics of the ILE teaching team, students and clients based on Geoghegan's (1994) comparison of the characteristics of early adopters and early majority

ILE teaching team	ILE students	ILE 2008 clients	ILE 2009 clients
Visionary	Mixed	Pragmatic	Visionary
Process oriented	Product oriented	Product oriented	Mixed
Risk takers	Mixed	Risk averse	Mixed
Willing to experiment	Mixed	Wanting solutions	Willing to experiment
Technically adept	Technically adept	Varying technical confidence	Varying technical confidence
Horizontally connected	Vertically connected	Vertically connected	Mixed

understanding, which requires a different type of assessment and different input from instructors. This includes acknowledging that anxiety is often part of the learning process (Savin-Baden 2007) and offering appropriate safety nets if necessary.

Most, if not all, formal learning experiences include elements of both product and process. However, as we found from our interaction with colleagues from different institutions, the relative importance of product and process can be very different. It is perhaps inevitable that a product focus leads to a more risk averse stance, and even a resistance to exploring a new technology altogether. There is a need to clarify the relative importance of product and process, especially if we are working with colleagues who may have a different stance.

The following diagram, Fig. 8.3, is offered as a tentative tool for assessing the stance of different participants in a new technology learning experience and shows the journey students made during both ILE presentations. It could be used to track the movement in stance of participants in virtual world learning experiences and might aid reflection on the factors that promote change.

Although Moore (2002) associates product orientation with the early adopter, and process orientation with the early majority, we make the tentative suggestion that in

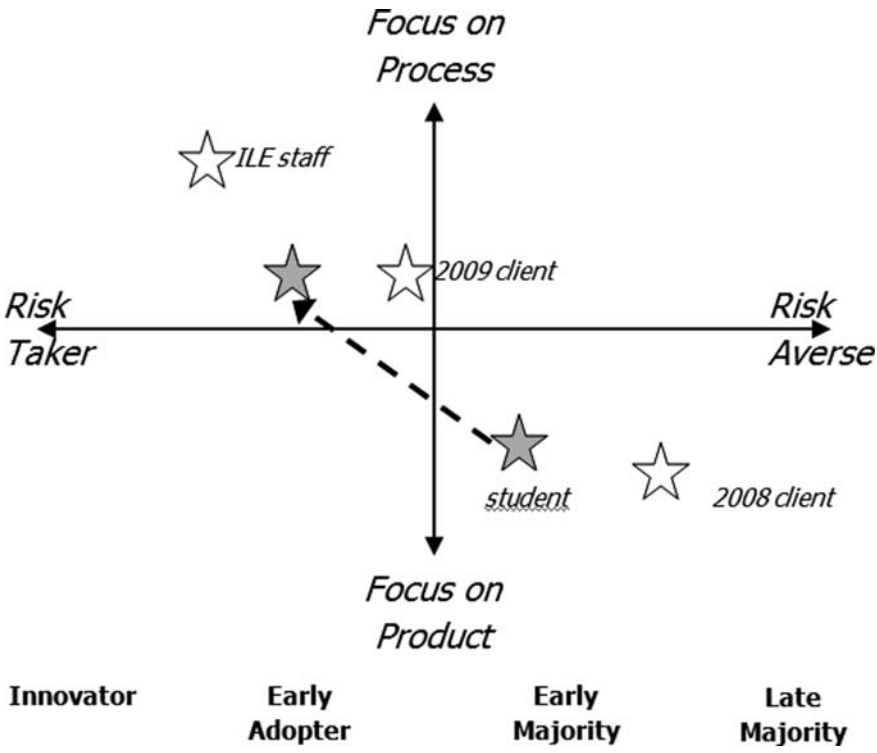

Fig. 8.3 The positions of project staff, students and clients at the start of each of the ILE presentations, showing the change in student positioning during the course and the different positions of clients in the two presentations

a learning context, our experience and observations indicate that the risk taking early adopter may have a greater investment in the learning process, while the more risk averse majority are more product focused. This observation needs to be tested in relation to other learning experiences in both virtual and physical world settings. In the case of ILE, the interest of the staff team was in what students learned from the process of developing interactive learning experiences in SL while our clients were more interested in the resulting products and the use they might be able to make of them.

8.7 Conclusions

This chapter is based on our experiences in two presentations of the Interactive Learning Environments course involving approximately 60 students and 12 clients. Although the two presentations were broadly similar, there were some notable differences. These concerned the recruitment of clients, the physical space in which the face to face teaching elements of the course were conducted, the increasing familiarity with SL of the teaching team, and the virtual space in which the course took place. Our observations and findings need to be tested by others using the virtual world of SL, and other virtual worlds to test their accuracy and usefulness in practice and in other contexts.

It is clear from our experiences, and those of others developing educational experiences in virtual worlds, that there are challenges to be overcome in working in these environments. Some of these challenges are inherent in the virtual world, others relate to physical world factors that impinge on the usability of the virtual world for teaching and learning and others relate to the learning and teaching experience itself. It is our view that by constructively engaging with the obstacles and talking about them, rather than assuming all is well, it is possible to create changes that make it more possible to integrate virtual worlds into mainstream education. We are also of the opinion that the gains to be had from incorporating virtual world learning experiences outweigh the difficulties that need to be overcome.

Which are the main boundaries to be addressed, if the early mainstream of educators is to be attracted to working in other virtual worlds?

Perhaps primary is the development of artefacts and teaching aids for use in the virtual environment that reduce the learning curve for new users. Those educators who are not enthusiasts and are not being given paid time to develop virtual world skills are unlikely to prioritise the development of such skills. However, if the virtual world is attractive enough in its affordances, if there is appropriate content and if the entry into the virtual world is straightforward, the early majority are more likely to consider its use.

Secondly, there remain technical issues to be overcome. Although SL is now more stable and software upgrades are less frequent, it still requires a computer of a high specification and with a powerful graphics card for a satisfactory inworld experience. The provision of such hardware has financial implications for institutions and educators considering the use of virtual worlds in their programmes. It is unlikely

anyone other than an enthusiast would buy a computer on the basis of whether it is good enough to run SL. However there are also exciting technical developments making the use of virtual worlds more inviting to new users. The initiative to make the medbiquitious patient not only open source but usable in more than one virtual world is not only noteworthy in itself, but paves the way for the possibility of more interoperability and transfer of resources between virtual worlds, perhaps leading to persistent avatars and inventories.

Thirdly, students can be prepared for potential risks in virtual worlds, but there are still discussions to be had, as indicated by Moschini (Chapter 3, this volume), about the ethics of the work being undertaken in virtual worlds. Knowing these discussions have happened and there are clear guidelines for work in virtual worlds could be a further incentive for the early majority to look seriously at virtual worlds.

Finally, as suggested by Savin-Baden (2008), virtual worlds do cause us to rethink our pedagogy. Taking students into an environment where both teachers and students are learners changes the dynamic and the relationship between teacher and student. Students are empowered as they realise they are knowledgeable and have a contribution to make both to their own learning experience and to that of their colleagues and teachers. The concept of "lead learner" is one deserving of more exploration in a HE context.

In understanding the boundaries and challenges to working in virtual worlds, we have found the diffusion of innovation model useful and we suggest some refinements to the model for application to the relationship between risk orientation and product/process in learning and teaching in technologically rich environments.

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Chapter 9
Mixed-Methods and Mixed-Worlds: Engaging Globally Distributed User Groups for Extended Evaluation and Studies

Daniel Livingstone and Peter R. Bloomfield

Abstract At first glance, the goal of the SLOODLE (Simulation Linked Object Oriented Dynamic Learning Environment) project is to develop educational technology – specifically, software for integrating web-based virtual learning environments and 3D multi-user virtual worlds being used for educational purposes. However, a second goal is to research how such integration might best be achieved – and to understand what users might want from such technology. And both goals rely in part on a third – to develop an active and involved community engaged in a participatory design process. This paper reviews the mixed-methods approaches that have been employed to support research as the project principals have been working to engage with users world-wide through a range of activities held in the virtual world of Second Life™ (SL), on the world-wide web and at demonstration workshops conducted in-person.

9.1 Introduction

The SLOODLE project (Simulation Linked Object Oriented Dynamic Learning Environment) aims to bring improved learning support to 3D multi-user virtual environments (MUVE) through integration with web-based virtual learning environments (VLE). Specifically, the project has been working with the Second Life™ (SL) platform, created by Linden Lab, Inc., and attempting to integrate a range of activities with the Moodle VLE. A contrary view of the project might be that it is attempting to bring activities from more immersive learning environments into the existing Moodle VLE.

There exist a number of VLE systems – also known with a variety of alternative acronyms, including "LMS" for "Learning Management System" and "CMS" for "Course Management System". The primary reason for selecting Moodle was that it

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is an open-source system with a licence that permits modification and redistribution (under common open-source terms). Moodle is also notable in that it has been designed to support a social constructivist approach to learning (Dougiamas and Taylor 2003), although this is not the only pedagogical approach supported by the software. Similarly, MUVEs are often characterised as social constructivist learning environments, see e.g. Dickey (2003) and Kemp and Haycock (2008). The Second Life platform was chosen primarily as it was the MUVE being used by the authors at the time of the start of the SLOODLE project, though it also had a number of other advantages over other MUVE platforms at the time:

- *Community*. While small compared to now, there was already a sizeable community of educators using Second Life – significantly more so than using any comparable platform. More recent surveys have confirmed that Second Life is the most commonly and widely used MUVE in the higher education community (Kirriemuir 2009).
- *User-generated content*. At its core, the Second Life platform is built around supporting user-generated content. This is valuable as an educational platform as it allows the creation of curriculum related content – whether by educators and learning technologists or by students.
- *Web-interoperability*. Scripted items in Second Life are able to communicate via a number of standard protocols with external applications on the internet – without requiring complex changes to the source code of Second Life itself. This was a fundamental enabler for the project.

The initial SLOODLE concept was to realise a Moodle course in three-dimensions – mapping the contents of a course page onto objects in SL positioned relative to the positions of matching blocks and activities on the web-page (Kemp and Livingstone 2006). More recent work has instead focussed on developing tools that enable access to different activities through both the 3D and web-based worlds, or which use the Moodle VLE as a form of back-end for activities conducted in SL (Livingstone and Kemp 2008).

As Wahlstedt et al. (2008) note, virtual learning environments provide empty spaces that can be used for education and learning. To turn those spaces into *places* where learning happens is not a simple matter of adding content. Interactions between users themselves are required – an active community of users is needed. In contrast, Bartle (2003) notes that virtual worlds are not games but places. Places where people play and socialise and, as evidenced by recent research (Kirriemuir 2009), educate and learn. They are also places where identity is uncertain and may be the subject of deliberate play (Bartle 2003; Bayne 2008). In conducting research in such a place we are engaging with a globally distributed community of educators in a place that they may themselves variously use for work and play.

The overall project goals then are to support both the rich sense of place and social community that exists in virtual worlds while continuing to provide access to rich sets of learning activities and learning management tools that are provided by most modern VLEs.

Embarking on this project, the principal participants had little certainty in how best to integrate such dramatically different worlds as MUVE and VLE. But with an understanding that such worlds have complimentary strengths and weaknesses in the forms of interaction and collaboration which they best support (Livingstone and Kemp 2006), we were hopeful that such integration would be of use and benefit to educators using MUVE. SLOODLE began as both a software development and a research project – aiming to develop the systems which would integrate a web-based VLE with a MUVE, and to conduct research on how such systems could best be designed and developed to support learners and educators.

Rather than spend many months developing elaborate systems before presenting to potential users for evaluation, an early decision was to try to involve SL users and Moodle developers in this process – to help drive the requirements analysis, and our understanding of what features users might find most useful or desirable. To obtain this input, it was first necessary to engage potential users and developers. This process is comparable to the development of Moodle, which itself leveraged learning communities in the development of the VLE (Dougiamas and Taylor 2003). Thus, the third strand of the SLOODLE project became a community development project, and the project itself has three very distinct categories of output:

- product (SLOODLE as software)
- community (SLOODLE as a community of users and developers)
- research (studies on the use/users of SLOODLE for academic and product development purposes)

Figure 9.1 shows how these three strands feed into one another. The existence of software/tools is required to attract users; feedback from users is essential for research (both academic and product development); and the research is required

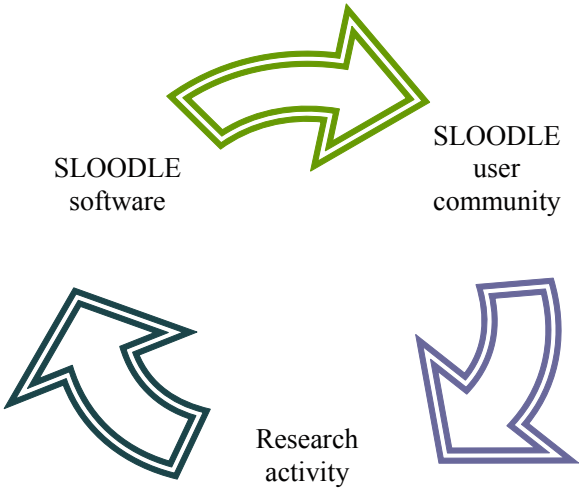

Fig. 9.1 The development of better tools feeds into user community growth. The existence of such a community enables recruitment for research activities which feeds into software development (and academic outputs)

in order to develop the product. Academic research outputs may be less product-oriented, but contributions to academic knowledge are also desirable outputs of the project – and are necessary to satisfy the requirements of external funding bodies.

9.2 Mixed Methods

The software development itself, individual design decisions, and software development methods involved are not of concern in this paper. Instead we review the processes employed in developing and sustaining a SLOODLE community, and how we have worked to engage this community in our research activities as we gather feedback from the community through a range of events and activities held in the virtual world of SL, online, and in person.

From a very early stage we have used a range of approaches and methods for gathering feedback and engaging the community – but the term "mixed methods" has a specific technical meaning within academic research. A definition of mixed methods offered in Johnson et al. (2007) reads:

> Mixed methods research is the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study or set of related studies. (2007 Johnson et al., p. 120)

Indeed, the term mixed methods generally has a very specific meaning, with a distinction between "mixed method" research and "mixed model" research. The term "mixed method" sometimes being reserved for studies which employ both quantitative and qualitative *phases* in an overall programme of study, while "mixed model" research might utilise e.g. a single survey with both quantitative and qualitative questions or might perform a qualitative analysis on quantitative data (Johnson and Onwuegbuzie 2004). Meanwhile, a programme of research combining, say, a survey based on open-ended questions, interviews and focus group discussions might not be using mixed methods, as these are all qualitative approaches.

As will be explained below the full range of research activities employed within the SLOODLE project encompasses both mixed methods and mixed models, the range of activities and research instruments used being guided in part by the need to engage and support a community at the same time as conducting research into that community.

9.3 Involving the Community

It has been key throughout the project to keep the community involved in the process. In this context, community members are not simply people who are already familiar with the software, but the term includes potential users as well – those who have not yet started using it, as well as those to whom it would be useful if specific requirements or adoption barriers were dealt with.

However, it is important to remember the reality that many people do not get involved in discussions or research, whether due to lack of time or interest. The community is consequently a somewhat arbitrary sample of actual and potential users of the SLOODLE software, resulting in a development model which resembles an informal participatory design process (Gould and Lewis 1985).

With this software development model, representative users are involved throughout the creation of the software, from its initial design onwards. This does not mean simply asking for user feedback periodically as development progresses from one iteration to the next, even though such a strategy is used and recognised in many forms, including iterative prototyping (Wagner 1990). Rather, it means allowing and encouraging users to be directly and effectually involved as concepts are proposed and decisions are made (Carroll 1996).

Web-based discussion forums provide one of the primary means for day-to-day participation in the development of the SLOODLE project. The open nature of the website allows for anybody to see and contribute to current discussions, and to see a complete archive of past discussions. Regular meetings held in the SL virtual world have open attendance, and archive materials from many of these events are stored publicly on the website as well. Other software is also used which allows community contribution, including a blog, a wiki, and a public software issues tracker which allows users to report software bugs or request new features.

The basis for such a participatory approach is that the individuals developing a piece of software generally have a different point-of-view from the end users. As a result of this, developers may make assumptions about the desires or expertise of users which are invalid. This is partly because developers do not always engage in the same activities as the users, and there can in fact be a wide variety of differing practices between different groups or communities of users (Beaudouin-Lafon 2004; Ellaway et al., 2004).

Involving users retrospectively to evaluate something that has been developed may be successful in identifying problem areas, but evaluating early and often, even in an informal way, is more effective (Dix et al., 1998).

Additionally, developers being so familiar with the software can lead to bias or lack of objectivity. This is partly addressed by having core developers running regular SLOODLE 101 classes in SL, which provide an opportunity for new and potential users of the SLOODLE software to ask questions and receive assistance. This means developers are exposed to community members on the threshold of familiarity.

However, participatory design is criticised because of the possibility for the representative users themselves to become similarly “too familiar” with the software, thereby losing their objectivity as well (Rubin 1994).

Such a possibility is equally applicable in a project such as SLOODLE, as a core group of particularly active community members tends to be evident in discussions and meetings. This is not always possible to avoid, since the choice to be involved lies with the individuals. Nonetheless, steps can be taken to extend participation beyond this core, as demonstrated by Bødker (1996).

In the case of SLOODLE, we have done this through various means. The conversion of our weekly "Developer Meetings" into more widely-appealing "Community Meetings" has seen a significant increase in participation. Instead of dealing solely with SLOODLE software development matters, the meetings are deliberately designed to cover broadly impacting issues which relate to educational technology and virtual worlds. This has allowed us to gather data regarding a variety of issues, while also benefiting participants and encouraging involvement. Meanwhile, the SLOODLE 101 classes continue to attract a mix of returning and new members.

Alongside these less formal participatory approaches, we have also conducted a mixture of more conventional research and data gathering techniques which we will discuss below. In order to recruit participants beyond our core of active community members, we have maintained a presence in related online communities, such as mailing lists and SL user groups. This increased exposure has been essential to drawing in new participants, whether temporarily, or as long-term community members.

9.4 Phases of Research

Figure 9.2 illustrates some of the key data collection stages in the SLOODLE project. Surveys were conducted in late 2006 ($n = 26$) and again in late 2007 ($n = 155$) to gauge interest in the project, obtain demographic data on the SLOODLE community, and to ascertain which features users most wanted or felt would be the most useful. While the first survey was purely quantitative, the second was a mixed-model survey, including a number of questions to be answered using free-text entry, or which allowed comments to be appended in free-text after selecting an answer option. Both surveys were conducted online, using "SurveyMonkey"–a commercially operated web-based survey authoring tool.

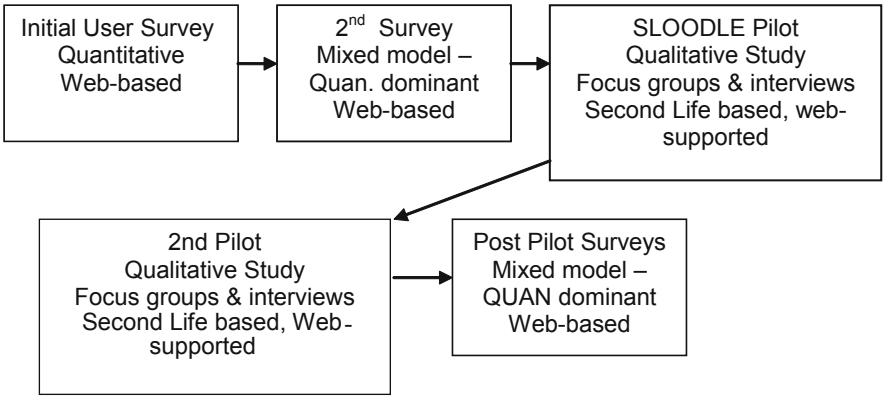

Fig. 9.2 Key research data collection activities. *Top row*: completed research activities include two rounds of surveys, and one pilot period. *Bottom row*: Current work is supporting users wishing to get involved in a second pilot, and the preparation of post-pilot study instruments for tutors and students using SLOODLE

Following these, an initial pilot ran for a period during the first half of 2008, and included focus groups which met in SL, interviews via email and in SL and discussion in Moodle forums.

We have since entered a second pilot period, during which we have again been using focus group discussions and interviews with SLOODLE users. These are being followed by post-pilot surveys, which again are mixed-model – combining quantitative with qualitative questions.

Additional activities from which data and feedback has been collected include the aforementioned regular in-world SLOODLE community meetings and SLOODLE 101 classes. The SLOODLE 101 classes have been running for around a year and have attracted anywhere from one to thirty participants at each session, with a typical attendance of around a dozen or more visitors. Additional workshops at conferences (including a number of virtual conferences held inside SL itself) have provided additional opportunities to receive feedback from users and potential users.

While academic research outputs will naturally focus on data gathered from questionnaires and from participants in the pilots, the participatory design process used means that there is almost continuous data collection in effect.

9.5 Engagement in Mixed Worlds

An issue that became apparent a few weeks into the first pilot was that the level of participation in pilot activities was significantly below expectations. An optional question in the second survey had been used to invite educators to take part in the pilot study – and around sixty had indicated interest in participating. At the start of the pilot, this number was reduced to under 20. Of these 20, a number then were unable to attend inworld focus group discussions. Forum discussions were also very limited. A significant interest in the project had failed to result in the desired level of engagement and participation for the pilot study.

A number of discussion meetings were facilitated, but to ensure adequate numbers it proved necessary to open up focus group meetings to allow other members of the SLOODLE community to attend. By having members of the pilot study other than the primary investigators facilitate some of the meetings, it proved possible to obtain some rich qualitative data on the use of SLOODLE – and on some of the existing barriers to use.

Over the period of the pilot several hundred additional users registered at the project website, sloodle.org, and attendance at SLOODLE 101 classes and weekly developer meetings remained strong. A number of reasons for the unexpectedly low level of participation have been identified, the key factors being:

- Workload/lack of free time. SL can be very time consuming for educators (New Media Consortium 2007), and participation in the pilot required some additional investment of time. This reason was explicitly stated by a number of participants who either withdrew completely from the pilot or whose involvement was very limited.

- Time zones and scheduling of meetings. Participants were scattered across the globe – primarily in North America, Europe and the Far East. Negotiating times for meetings with such a disparate group is difficult – before even considering individual availability and work timetables. Arranging multiple meetings to accommodate different time-zones resulted in a number of focus group discussions having unsatisfactorily low numbers.
- Class time-tables and calendars. The original idea for the pilot was that most participants would be actively using SLOODLE tools with their students during the pilot. This proved impractical as many educators interested in the pilot were not involved in teaching classes in SL during the pilot period – variations in individual and institutional calendars mean that recruiting a number of participants that meet this criterion introduces a further challenge.
- Participant issues and problems in using SL. One participant related how technology problems in his institution prevented his intended class in SL from running – although he still took part in group discussions. It is not known how many other potential participants were dissuaded from taking part for similar reasons.
- SLOODLE software was not sufficiently easy to install. In particular a number of participants first had to install and configure Moodle before being able to install SLOODLE.

Ultimately, despite these limitations, the pilot resulted in sufficient feedback and data being collected to be considered successful. Some of the information gathered in the pilot was very rich in detail, and one illustrative case-study (providing a detailed example of how SLOODLE may be used to support learners) has already been published following the pilot, and an academic publication detailing some of the research findings was subsequently published (Livingstone et al., 2008).

One of the most successful activities for collecting data was to have participants themselves facilitate discussions, presenting details of their classes. This proved to be a rich source of information, and allow the research team and other participants to ask in-depth questions. For two of the participants, their presentations proved to be the only occasions when they were able to attend discussions during the study.

An example of how this focus group based approach was able to draw out useful qualitative data comes from one of these participants. Chris Surridge, an instructor in technical English at KAIST – the Korea Advanced Institute of Science and Technology, discussed how his students were using the SLOODLE chat-logger (now renamed web-intercom):

> So they can kind of perform a post-mortem on some of the interactions. I saw students in class today who had found the chat room and were back in there again checking out what they'd typed were kind of taking it apart

As developers we were aware that the chat-logger was useful in providing an archive of meetings and discussions, alongside its ability to enable discussion between users on the web and users in SL. But we had been oblivious to the pedagogical potential of this particular tool when using SL for learning a second language. Chris' class is mentioned in (Livingstone et al., 2008), and an extended

write-up of the class was subsequently presented as a best practice case study. This last is available from the SLOODLE web pages, at http://www.sloodle.org/research/

9.6 The Second Pilot

In the design of the Second Pilot we have tried to consider the problems encountered in the first pilot and to provide additional support or resources where appropriate. We are unable to address time-constraints or work-loads on participants, nor are we able to resolve local technical issues preventing access to SL, but most other issues can be addressed. While the pilot is still underway at the time of writing, and the degree of success that these measures will result in is unknown, the strategies employed here may be of interest to others wishing to conduct similar studies on education in virtual worlds.

9.6.1 Time-Shifting of Data Collection

The second pilot relies less on the use of pre-determined and restricted membership focus groups, with attendant problems of securing attendance from pilot participants at times suitable for participants in different global locations. Weekly open community meetings have been initiated instead, with meeting times alternating to ensure that users in all parts of the world have opportunities to attend. Additionally, two mixed-model (qualitative and quantitative questions) survey instruments have been prepared, to be supplemented with individual interviews where possible. Two survey instruments were prepared to allow distinct sets of questions to be presented to students and tutors, allowing questions to be targeted to the user.

As community meetings are ongoing and the surveys can be completed whenever a SLOODLE user has finished tutoring a class using the tools, this frees data collection from a restricted range of dates, and is more supportive of educators running their classes at different times of the year for varying lengths of class. Instructors who have been using SLOODLE are regularly invited to guest at community meetings allowing opportunities to share good practice as well as to gather data on the use of the tools.

Where the topic under discussion at a community meeting is of particular relevance to our research, the community meeting becomes a focus group, using Morgan's (1996) inclusive definition of the focus group. The researcher can introduce and lead the meeting, or a guest may be discussing their own use of SLOODLE with the researcher acting as a host and encouraging those in attendance to ask questions and contribute their own thoughts.

9.6.2 Land and Servers

A SLOODLE island has been obtained in SL, and will host information, demonstration and meeting areas as well as areas of land which are being granted without

charge to educators participating in the pilot. This helps support educators who might not have sufficient space for their classes on their own land in SL – or who do not have any land in SL at all.

We are also offering free Moodle hosting – with SLOODLE pre-installed. Together these steps remove a number of barriers, both technological and financial. Educators no longer need the technical or financial resources required for setting up their own web-servers for Moodle and can receive assistance in setting up their content in SL itself.

9.6.3 Ease of Use

After the conclusion of the first pilot, a new version of SLOODLE was released. SLOODLE 0.3 involved a number of changes to the process used to set up SLOODLE resources in SL. Further refinements and new features were added in the 0.4 release, which was made available during the second pilot phase. With a streamlined and simplified setup process, and the existence of regular classes, feedback indicated that educators are finding SLOODLE significantly easier to set-up – although in a number of cases difficulties encountered by users are still being resolved via forums or in-world meetings.

Practical examples also have a role to play – to show educators how SLOODLE can be used in realistic contexts. As noted earlier, one example case-study has already been written, following on from the last pilot, and further example case-studies will be developed and distributed online as the second pilot progresses.

9.6.4 Feedback from Students

In the first pilot we collected data from educators – but not from students. Collecting responses from students does raise ethical issues. Because a number of the pilot classes with SLOODLE will be running on an island in SL administered by the research team, we will have an opportunity to invite students to complete survey instruments. This has been discussed with, and approved by, the Ethics Advisory Panel at the University of the West of Scotland. We hope that this will provide further insights into the successful and appropriate use of SLOODLE.

Rather than develop a new survey instrument from first principles, we are using a modified version of the Learning Architecture Framework (LAF) survey instrument detailed in Ellaway et al. (2004). This instrument is derived from Wenger's description of a Learning Architecture Framework (Wenger 1998), and is designed to support the evaluation of a VLE in the context of its community of practice. While Ellaway et al. note that a result of this is that the survey tool is of most use where there is a pre-existing community of practice, it may be applied to evaluate VLE's used in more modular courses that maintain some degree of internal coherence. We believe that the embodied and social nature of online classes taught inside SL is such that this is a fair assumption to make.

However, a number of changes were required. The LAF survey instrument lacks any demographic related questions, which would be useful in helping us see how SLOODLE is being adopted around the world by different types of institution, but still has 60 items. In the context of Ellaway et al., this might not be a significant issue – but we were concerned that asking students not affiliated with our own institution to complete such a long survey, with additional questions to allow us to also learn more about the different courses and student bodies using SLOODLE, might result in a high rate of non-completion. We noted that the LAF instrument arranges questions in triples, wherein each aspect is evaluated in terms of its general usefulness or effectiveness for the course, its specific usefulness or effectiveness for the student in question, and the importance of this to the student. For example, one question triple contains the following questions:

- How effective in general is the system at supporting out of hours working? (Excellent to awful)
- How useful is the system at supporting your need to work out of hours? (Excellent to awful)
- The system's support of my work out of hours is important to me ... (Strongly agree to strongly disagree) (Ellaway et al., 2004)

Removing the third question in each triple we no longer are able to judge which aspects are most important to students, but are still able to evaluate the effectiveness and usefulness of SLOODLE, while significantly reducing the overall question count – and hopefully increasing completion rate.

The modified instrument was piloted with University of the West of Scotland students and is currently open to students on other courses using SLOODLE.

9.6.5 Forums

For the first pilot, a Moodle course was set up specifically for the pilot. This was under-utilised and was not repeated for the second pilot. Instead, existing forums on sloodle.org, email and in-world communication are being used. A mailing list for the pilot was considered but as participants will be joining and leaving the pilot at different times, this was decided against.

9.6.6 Participant Engagement

As noted, one issue we cannot resolve is the work-load on participants. Given this, it is vital that we do our utmost to engage participants with the SLOODLE project to try to encourage continued involvement in the pilot. It is hoped that the free-land and server support will have an effect there. For participants using their own land and servers it is important to maintain contact and work to provide support when required.

To the extent that the first pilot was successful, running regular classes on the use of SLOODLE in SL, holding open developer meetings in the same environment and having a visible presence in the virtual world all contributed to that success. For the second pilot, similar or increased levels of support have been provided where possible.

9.7 Applying and Refining the Methods for Usability Testing and Development

In essence, our use of mixed-methods within the SLOODLE project has evolved over time as we have experienced problems with building and sustaining engagement from a diffuse community of users. As Fig. 9.1 showed earlier, the software output is a crucial strand for supporting and encouraging community involvement. Recognising the importance of ease of use of the software and tools, related research is being conducted alongside the SLOODLE project with a focus almost entirely dedicated to usability.

Practically, it is difficult to draw a clear line between research activities which support SLOODLE's product development and those intended to produce academic outputs. In principle, some research and analysis is directed towards basic research, where we attempt to improve our general understanding of how web-based and 3D learning environments may best work together. At the other extreme, usability studies may require research on, e.g., specific interface issues that may not be easily generalised. Away from the extremes there is significant overlap, and in practice data gathered for one purpose may also be useful for the other. With this in mind, the current section outlines some of our more narrowly applied research activity.

Usability is an area which has been commonly misunderstood or underestimated in the past, even in well-established commercial software development (Gould and Lewis 1985; Hornbæk and Stage 2006). Despite a large increase in usability research and literature since the publication of the work by Gould and Lewis, there is no definitive definition of the term, nor is there a single "correct" solution to usability problems. However, it is fairly commonly understood as comprising of attention to the usefulness, effectiveness, learnability, and likeability of a piece of software (Rubin 1994; Booth 1989).

This supplementary research does not seek to propose completely original ideas in the field of usability, nor does it attempt to create completely new concepts for educational technology. Rather, it is taking what is already widely known about usability, and investigating how it could be applied to educational technologies in the context of the SLOODLE platform integration. In this chapter we are most concerned with the methods employed in this additional research, and how they relate to research activities already discussed.

The methodology being used in this case differs somewhat from the heavily participatory approach used in the primary SLOODLE research. One of the main reasons for this is that it can take a long time to reach any conclusions when the community is involved so much.

This is because our implementation of participatory design is necessarily informal, relying on participants volunteering in their spare time, using largely asynchronous discussion. This is in stark contrast to industrial implementations, where there can be frequent formal meetings, in which participants are contributing in a professional capacity (Bødker 1996).

User involvement is still a key factor, since usability is entirely concerned with the impact on end users. However, instead of building a community around an evolving research project, it relies on incubating specific ideas in-situ and drawing useful conclusions fairly rapidly on how to improve. This can be known as action research (although we note that action research encompasses a number of different methods and approaches), and is certainly not new to the field of human-computer interfaces (c.f. Stringer 2007 and Carroll and Rosson 1992).

9.7.1 User Centred Design

In practice, we are applying principles of user centred design (UCD) to aspects of the SLOODLE software development process. User centred design has been gaining widespread support in recent years, as it builds upon human factors engineering, and effectively addresses usability design and evaluation (Venturi et al., 2006; Mao et al., 2005).

User centred design is in some ways not so very different from the SLOODLE approach so far. Rubin (1994) identifies participatory design as "an embodiment of UCD" (p. 20), and although Carroll (1996) makes a greater distinction, he does conclude that the two techniques "have interacted fruitfully... in part because of their somewhat complementary foundations" (p. 289). The key distinction is that in UCD the designer or researcher typically retains tighter control over the process. In UCD user participation may be restricted to the role of research subject, whereas in participatory design participants may have significantly more active roles.

Instead of "user centred design" a more suitable term might be "learner centred design" in the current context. Many of the principles are the same, although it is argued that learner centred design requires paying greater attention to the learners' needs and the variety in their preferred learning styles (Ardito et al., 2004).

This work is in the preliminary stages, but has so far incorporated three evaluations.

9.7.2 Workshop Survey

The first was a very brief quantitative survey, assessing a new educational tool called "quizHUD" (Bloomfield and Livingstone 2009a; Bloomfield and Livingstone 2009b). This survey was administered during a regional event covering the use of virtual-worlds in education, at which there was a schedule hands-on SLOODLE workshop.

The workshop itself also gave an opportunity for personal contact with a group of individuals using the software for the first time, and to see first-hand the difficulties

encountered. This advantage was reduced to a small extent, however, by the wide participant range of prior experience with SL – with some attention taken up by helping a few users overcome very basic issues in controlling and using avatars, and even with creating avatars to use. While embedding a survey into workshop activities can guarantee a high degree of participation, the direct and indirect costs of using such workshops as a means of gathering data and feedback compare poorly against inworld events where it is also safe to assume that all participants already have at least a basic knowledge of SL.

9.7.3 Virtual Focus Group

The second evaluation conducted was a virtual focus group. The topic of the group was methods of representing and supporting discussion for a class in an immersive virtual world, considering both asynchronous (such as forums), and synchronous (such as chatrooms).

The group was conducted in a fairly informal manner, in SL, using text-based synchronous communication. The decision was made to conduct it as a virtual focus group for three main reasons:

Fruitful discussions required some familiarity with immersive virtual worlds – conducting the group within one effectively screened-out potential participants who did not meet this criteria.

The concepts at the centre of the group discussion were designed for immersive virtual worlds, and it would be difficult to accurately illustrate them in any other medium.

Holding the focus group online allowed a more geographically diverse range of participants to attend the group.

Twelve individuals participated in the 1 h group, with a few non-contributors present at various times.

As an evaluation instrument, the virtual focus group appeared to be effective in ways that a conventional focus group may not have been. In the first place, it provided convenience for participants – instead of having to travel to a particular location, participation from home or normal place of work was possible. It also provided a relaxed atmosphere as evidenced by the social and playful interactions occurring prior to the group starting.

Participants also appreciated the opportunity to examine the proposed tools in the immersive setting. Instead of simple diagrams or pictures, we showed 3 dimensional models which the participants could move and look around independently of each other.

This allowed very rapid inclusion of some feedback. In the case of one proposed tool, a participant commented that she “might prefer vertical display”. This modification was made immediately to the tool, and the response was that it actually lost some of its meaning in the different orientation. With the virtual focus group it was thus possible to immediately put some suggestions and ideas to the test and gain multiple iterations of feedback and comment.

However, there were some problems regarding conducting a focus group in this way. One issue which was not expected was shared user accounts – one apparent participant in the group was actually under shared control by two people at one computer. This was noted incidentally at the start, and they suitably identified which person was contributing at any given time. A concern here is the potential for such a situation to go unnoticed, resulting in misleading data.

The use of text-based communication also posed some difficulties. It became difficult at times to follow all of the comments, since different users would inadvertently contribute comments at the same time, resulting in a large amount of text to read. Secondly, some participants were noticeably slower typists than others, which could have prevented them from contributing as much.

While text-communication was adopted to allow for easier capture and logging of the discussion, it could be beneficial in future to attempt virtual focus groups using voice-based communication instead of text.

9.7.4 Exploratory Survey

Some of the results from the focus group were used to guide the content of the first large survey of the research, which is being distributed at the time of writing. It is exploratory in nature, meaning that it aims to evaluate "the effectiveness of preliminary design concepts" (Rubin 1994). The data it collects will be a mixture of qualitative and quantitative, asking users about their background role and experience, and their opinions about a few initial concepts for the software project.

9.8 Conclusions

The most significant challenges faced by the SLOODLE project are not software development issues, but user engagement and support. Educators working in SL have a steep learning curve to overcome and there is a great deal to learn about working in the environment without having to learn about additional software packages such as Moodle or SLOODLE. However, we believe that SLOODLE can bring benefits to educators using SL and Moodle – and findings from our pilot studies and the growing user base support this view.

Research activity to date has mixed research methods and modes. Surveys and focus groups have been used to inform and guide the project – from initial evaluations of interest, to development priorities and goals. The quantitative data gathered from surveys is primarily useful in the preparation of academic reports and in guiding project development. In contrast, the rich, qualitative data gathered from focus groups not only provides supporting evidence for this work, but is proving to be a source of good practice case studies, aiding in the creation of practical materials to support tutors newly adopting SLOODLE. The focus groups themselves also act as a social meeting space for community members, and help maintain the sense of researchers, developers and users all being part of the one, active, community.

Additional work is now being conducted to evaluate and test proposals for alternative implementations of individual tools – again using focus groups and survey tools. But even now, the project is still in an early state of development and it will continue to benefit from further research on the effective integration of web and 3D virtual learning environments in the years ahead.

A continuing mix of quantitative and qualitative data will be gathered to continue the participatory and user centred design approaches employed by the project and to investigate the more general principles behind SLOODLE. And the continued input of educators, technologists and students in this research will be crucial to its success.

With around a dozen core modules in Moodle, and over 400 plug-ins available for the VLE, Moodle is an extremely flexible and adaptable learning environment. Exploring the full range possibilities for creating 3D analogues and complements to the core and plug-in modules is clearly a task beyond the capabilities of a small team of developers. Thus, this high level of community involvement will remain crucial even as the core toolset starts to mature.

The inherently social nature of the SL platform can be leveraged to recruit participants for research studies but, as we discovered during the first pilot, high levels of participation are not guaranteed. It is important to provide support and a reason for users to engage with the research process. Outside of SL itself, posts to the SL Education (SLED) mailing list are sent to over 4,000 educators worldwide and this is an easy means to publicise research and to try to recruit participants. But with the list regularly featuring requests for participation in research, this may lead to "survey fatigue" amongst members of the education community – and we have observed that requests generate less response than they have previously.

Thus we have seen that a range of support activities are required to build participation in research studies as well as to encourage the growth of SLOODLE adoption. These vary from providing technical support and resources – such as hosting Moodle and/or SLOODLE for participants – to email and forum based support and the development of practical example case-studies to provide concrete illustration of how SLOODLE may be used to support learning and teaching.

The issues that have arisen in this work are ones which may face other researchers attempting to work with globally distributed communities of virtual-world education practitioners over a period of time. It is hoped that the methods we are employing for our second pilot will not only lead to increased engagement and participation in that pilot, but that they may prove useful to other researchers conducting longitudinal research studies with similar communities.

We have also described our fairly recent work to refine our research methods, by applying existing usability approaches in this new software area. It is therefore hoped that this continual refinement will bring substantial long-term improvement to our work, in terms of the research and software outputs. It is also hoped that it will help other researchers who may be conducting similar research in the future.

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Chapter 10
This is Not a Game – Social Virtual Worlds, Fun, and Learning

Mark W. Bell, Sarah Smith-Robbins, and Greg Withnail

Abstract This chapter asks a simple question: what is required to make learning fun in social virtual worlds? Several scholars have connected fun with learning but most of these have centered on the function of games in learning. Studies of learning in massive multiplayer online role playing games connect the game mechanics to how learning occurs. However, few have asked whether learning in a virtual world can be fun if there is no game. In a social virtual world, like Second Life (SL) there are no game mechanics (unlike game worlds like World of Warcraft [WoW]). There are no quests, challenges, rewards or other game elements in SL. So can a virtual world that has no game-content provided be a place where fun learning can take place? We define fun and explore how fun has been related to learning. We explore theories of fun from Koster, Crawford, Csíkszentmihályi and others as well as views of the ways fun is explored as related to the learning experience. With these models in mind, we explore how fun is different in a social virtual world. Drawing on definitions of fun from Castronova and others, we see game structures in virtual worlds may not be needed to have fun. These fun activities include game creation, business interactions, and most importantly, identity play and socialization in a social virtual world. Finally, we propose that if learning is to be successful and fun in a social virtual world it should pay close attention to these two activities.

10.1 Introduction

It's common knowledge that people will spend more time and effort toward something that is fun. The hobby and entertainment industries alone are sufficient evidence that we are willing to spend considerable amounts of time and mental effort on projects or activities that we enjoy. Hours spent building model airplanes, years of research on one's genealogical history, great mental efforts applied to crossword

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and sudoku puzzles – all of these examples demonstrate the significant time and energy the average person is willing to put toward activities they feel are enjoyable.

We also know that spending a greater amount of time and effort allows us to learn something better. Of course, this time and effort needs to be spent intelligently and productively. Studying in ineffective ways for hours does not guarantee a greater amount of knowledge mastery or increased application. However, well constructed study experiences do yield higher knowledge retention. Every student who has ever gone through flashcards for hours or taken the time to practice an exam beforehand knows that one's chance of improving performance on the test increases with the effort and time spent.

We believe that it reasonably follows that if a learning activity is truly fun it will be more effective. We're not suggesting that education be "dumbed down" to make it more fun. However, we do believe that the elements of fun that make an activity engaging and enjoyable, when applied to learning, can make the educational experience more powerful, pleasant, and engaging. It's important to note though, that although much of the recent fun and learning research focuses on applying games to education, we will not be focusing on games (Gee 2007; Prensky 2007; Gibson 2006; Aldrich 2005). Rather we see it as important to focus on ways learning activities might be made intrinsically fun without the external motivation that game mechanics provide. After all, most of life doesn't offer us such clear structures for success. In most situations we're forced to shape our own motivations. To this end, we propose here to analyze what makes an activity fun and explore how those elements may be applied to a learning activity in a non-game based virtual world.

To begin, we will cover the body of work that has shown fun as a motivating factor in learning and the characteristics that can be included in learning to encourage those motivations. Then we discuss the value and definition of fun and relate that definition to motivations of goals. This structure is then applied to the social virtual world of *Second Life* (SL) to find what sorts of activities can be defined as fun in the absence of game mechanics. Finally these sources of fun are related to learning environments and suggestions are made for how to create learning situations in a social virtual world (SVW) that build on these new structures of fun.

10.2 Motivation to Make Learning Fun

It is easy to assume that by making things fun people will learn more but how does one make something fun? This is by no means a new idea (Csíkszentmihály 1997; Koster 2004; Castronova 2005) and leads to the central paradox of fun and learning. How can something be fun and still lead to serious learning? The educator must be careful not to let the fun interrupt or overshadow learning goals falling into a trench of edutainment. Also how learning *for* fun differs from fun learning must be explored. Finally learning and virtual worlds is explored and linked to the concept of fun.

10.2.1 Fun Learning is an Old Idea

As mentioned previously, the connection between learning and fun can be self evident. This is by far not a new idea. Crawford links games and fun to learning in animals to stress how naturally play and learning are connected (2003). In human society, he says, games have been teaching people skills since pre-history. So the question of games and fun having value to learning is a bit absurd. Koster (2004) describes a constant tension in society over "childish things" (fun and games) and the perceived serious world of learning.

10.2.2 The Edutainment Argument

The traditional notion of the serious, controlled and reserved twentieth century classroom may stand at odds with the notion that learning can be "fun" but any educator can recall the thrill of learning and the enjoyment it brings. It has also been postulated that making learning fun may reduce it to edutainment. Edutainment is the notion that learning goals will fall to a secondary place while the entertainment or shallow nature of fun will takes a primary place. Okan (2003) warns that too much edutainment makes people expect all learning to be fun and easy. Instead, we argue that adding fun to an educational setting should endeavor to encourage intrinsic or autotelic learning, as Csikszentmihalyi terms it (1997), that has fun as a component but uses internal and personal learning goals and aims as the engine that drives new understanding.

10.2.3 Fun Learning vs. Learning for Fun

We'd like to differentiate between learning that is fun verses learning *for* fun. As Packer (2006) reminds us, most research on autotelic or intrinsic learning focuses on self-directed learning *for* fun. Packer's study, for example, examines how museum and zoo visitors consume educational content. Perhaps learning in virtual worlds may take the same course, this course being informal and incidental and spawned by the environment rather than an educational structure. While educators would hope that students become autotelic learners, i.e. learners who pursue opportunities to explore ideas without the external motivations of grades or punishment, we also know that within the formal education system students are expected to learn according to the curriculum rather than their personal interests. Therefore, in this article, we focus on ways to convert one to the other, to help learners develop the ability to feel more intrinsically motivated to learn.

10.2.4 The Effects of Fun on Learning

Before applying these notions of fun to SVWs it might also be useful to see what characteristics of fun can have a positive effect on learning. Bisson found

characteristics of fun are that it is relative, situational, voluntary, and natural. He also found that fun can improve the learning process by encouraging intrinsic motivation, suspension of social inhibitions, reduction of stress, and the creation of states of relaxed alertness. Bisson and Luckner (1996) center on the way fun attributes an important intrinsic motivation in the education experience. First, fun creates a desire for the learning experience to reoccur. Second, fun can also motivate learners to new experiences. Any successful educational experience in virtual worlds should reinforce these two goals.

10.2.5 Growth of Virtual Worlds in Learning

Fun learning is nothing new but has been the source of conflict between the playful lightness of fun and the serious business of learning. With the advent of new technologies, this debate is brought to the forefront over and over again. Should television be used in the classroom? Can a student learn from a video game (simply ask the legion of devoted fans of the educational game Oregon Trail and they would say yes) and finally can virtual worlds be used as effective learning environments? It is apparent we can learn from games as Gee demonstrates via his analysis of semiotic domains, critical thinking, discovery and other elements present in his "36 Learning Principles" of games (Gee 2007). Once we accept that games can be important tools for learning, virtual worlds like Massively MultiPlayer Online Role-Playing Games (MMORPGs) with their heavy prominent game mechanics can be seen as successful learning environments, but can virtual worlds be used to teach more than the world itself? By overriding game mechanics we mean the structures, interactions, encounters and objects in the world all serve a function in the game. For example a monster provides a challenge you are rewarded for, a building can provide safe haven, and a road can show the way to the next section of the game. Everything in a game world is there to enrich your game experience. In *World of Warcraft* (WoW), you learn how to play WoW. What happens in social virtual worlds (SVWs), such as SL, where no overarching game exists?

We can easily state that all games are intended to be fun but not all fun is related to games. If this is the case, if there is no game, what elements are required to make a learning experience fun in a virtual world? To discover the answer to this question we need to review what fun is and what fun is in virtual worlds, especially ones that lack over-riding game mechanics.

10.3 Defining Social Virtual Worlds

If SL is not a game, the question that immediately pops to mind is then what is it instead? Castronova's (2005) definition of synthetic (or virtual) worlds is "crafted places inside computers that are designed to accommodate large numbers of people." This definition covers both WoW and SL. So these social worlds are virtual worlds but not games. Bell & Robbins-Bell (2008) state that all virtual worlds

include a "network of people" so an essential characteristic of any virtual world (MMORPG or "other") is a social element.

To begin, there are a number of SVWs. They span from the simplistic virtual worlds aimed at children (such as Club Penguin) to the robust and broad world of SL. New social worlds are being developed every day around areas like music and lifestyle (MTV's Virtual Lower East Side), product marketing (Mcworld by McDonalds), teen culture (Habbo Hotel) and sex (Red Light Center). Though there is a wide range of these socially-oriented spaces, this chapter will center on uses and examples of SL. SL is one of the largest, most popular and most diverse social worlds that is currently inhabited. In a way, SL has become the torch bearer of the group of social worlds. Social worlds are too often defined by what they lack rather than what they are. A social world has no game rules, directed tasks or rewards system. Some could see SL as an MMORPG, with all the game and narrative elements removed. There is no doubt MMORPGs are social in nature, but they have additional ludic elements that SVWs lack. This view does not cover all the differences between MMORPGs and SVWs.

For instance, SVW are worlds which allow the users to create more complex user generated content. Some MMORPGs allow the users to create small scale simple content (crafting in WoW or guild houses in *Lord of The Rings Online*). All of the MMORPG user creation is highly regulated and, within the context of the game mechanics, SVWs like SL allow limitless user creation of objects that other users can interact with. As a possible culmination of Jenkins' convergent culture (2006), social worlds are filled with prosumer created content. Everything in SL has been created by the residents not the company, Linden Lab, which runs the world. Conversely, WoW contains only company-created content. Without the artifice of the game structures and narratives the social world is a blank slate allowing a new type of culture to develop (Boellstorff 2008). Everything in SL but the basic avatars is user-created. Conversely, an MMORPG has a tiny amount of user-created content.

Finally, at its heart, a SVW facilitates and promotes social interactions of different forms. MMORPGs have very similar social interaction mechanisms (text, avatar body movements, and voice) but SVWs facilitate further social interactions. One of the most common social interactions in virtual worlds is the formation of groups. For example, in a MMORPG a user can typically only be part of one group or guild (large group) at a time. Also, there are usually limits placed on the size and membership of these groups. These restrictions are usually game related, for example you can't have an enemy player join your guild. In a SVW, there are fewer limits of group membership. For instance, in SL, you can join up to 25 groups. There are no membership restrictions to these groups. The restrictions in MMORPGs and freedoms in SVWs demonstrate the differences in social interactions between game and social worlds.

Along with different social interaction structures some SVW residents have the ability to communicate stigmergically. Stigmergic communication is the act of changing the environment to communicate a message. This would include something like setting a "wet paint" sign on a freshly painted bench. This notion came from studies of insects (Grassé 1959) and has been used in the studies of wiki use

(Elliot 2007). In a game world like WoW this is nearly impossible. However useful it would be to other players to leave a sign saying "Treasure this way," a WoW player cannot do it within the game. Conversely, in SL these kind of stigmergic installations are common. If you have a store in SL that runs while you are not logged in you must communicate your message to other users without your avatar being present.

10.4 Valuing Fun

Does fun have any value? Obviously we have all felt the lasting positive emotional effects of fun but is having fun important to our human nature? Is it a requirement and how does a desire for fun manifest itself in virtual worlds? Again in game-laden virtual worlds like WoW the fun potential, motivation and goals are easily observed. Millions of people spend hours in these types of games enjoying themselves with no external value to their activities. The SVWs may manifest different motivations and goals in relation to fun.

Once a rarity, there are now hundreds of virtual worlds (Smith-Robbins 2009). Castronova's explorations of virtual worlds (2005, 2008) uses fun as a center of his argument for not only the appeal of virtual worlds but also the effect of them. Castronova's subject is the generalized "virtual world" and draws examples from *EverQuest* (EQ), *World of Warcraft*, (WoW) and SL among others. The topic of fun in MMORPG's is clearly covered in Castronova's work but what about fun in social worlds? Can Castronova's concept of fun happen without having the ludic structures seen in MMORPGs?

10.4.1 What Is Fun? Various Definitions

Fun is too easily taken for granted. Most of us live part of our day in a mental state that can be called "fun" but rarely take the time to explore and critically appreciate fun. To understand how fun relates to learning and virtual worlds, existing definitions need to be reviewed and evaluated.

Trying to collect definitions of fun, leisure and enjoyment, Podilchak (1991) combined several definitions to define fun as "a manner of doing an activity and the emotional condition created by such involvement." Though this definition works for Podilchak's context (which is the comparison with enjoyment and leisure) it lacks a set of identifiable characteristics needed in this context.

Game designer, Raph Koster, defined fun as "the act of mastering a problem mentally" (2004). This definition is also problematic. First it is easy to find examples of activities that are fun that do not tax you mentally. For instance, a physical activity like dancing may not provide a mental problem but can certainly be fun. Second, there are problems one can master mentally that are certainly not fun. For example, writing a budget for a company may be a taxing mental problem but it is probably

not something that could be described as fun. Koster's definition describes the mental state of fun but isn't specific enough to differentiate that activity from enjoyable or unenjoyable activities. Also Koster does not cover losing oneself in the fun as does Csíkszentmihályi (1997).

Since we are looking at fun in relation to virtual worlds, perhaps looking at a definition from virtual world scholarship defining fun is useful. Castronova (2008) defines fun as a "pleasurable sensation attributed to an activity" when a group of criteria are met. These include co-activation of motivational systems, relevance (even metaphorically) to survival, individual choice related to survival and a situation known as "play". It is easy to apply this definition to MMORPGs. For example, in an MMORPG a character might be challenged to save a village by defeating an approaching horde of monsters. The player sees how the survival of his character and village are dependent on the character overcoming fear and defeating the approaching monsters. Also the character knows if the monster is defeated they will receive a reward. This situation is extremely common in MMORPGs and so they illicit fun. Castronova (2005) centers on the economics of virtual worlds and adds these qualities of fun that may or may not be transferable to non-economic fun:

- Consumption and acquisition
- Fair returns on work and skill
- Creation, of things and the self
- Mission and purpose
- Robust competition under equal opportunity
- Risks and bargains

While most scholarly and professional attention in the virtual worlds arena is devoted to social worlds such as SL, game worlds like WoW occupy several orders of magnitude more human attention. One explanation might be that game worlds are simply about having fun, and, since fun is not a serious thing, it is natural for serious, sober professionals to devote their attention where fun is not. SL can be construed as a very serious thing indeed, a platform for erecting structures that serve ends like productivity, advertising, public education, and so on. Many such structures clearly convey the heavy intentions of the builders. At conferences, those not familiar with virtual worlds are prone to confuse SL with WoW and refer to it as a "game," only to have someone more experienced notify them that "*Second Life* is not a game." However, we would suggest that this oversight is largely due to a confusion between fun and games. SL, though not a game, is no more bereft of fun than is the analog world.

It seems apparent that social worlds/non-game worlds are glossed with the label of not being fun, for reasons largely unrelated to what actually happens within them. Because of the cultural contestation regarding the ludic status of social worlds, however, scholars have generally overlooked this fact. We are left with a fairly basic question: What is the fun inside SL? Granted, social worlds are not games. Nonetheless, absent of quests and dragons, how does this world make its users happy?

10.5 Motivations and Goals

To begin, let's apply Castronova's criteria for fun to a common virtual world game situation. A player-character has been challenged to save a village from an approaching horde of monsters. He has been given a goal in the context of what is obviously a game, which fits with Castronova's. The choice of whether to accept the challenge, followed by the choices about how to tackle it, together tick another of Castronova's criteria of fun. The player knows that the survival of his character and the village is dependent on the character defeating the monsters. The goal is specific, and has a survival aspect, but he is free to approach it as he wishes, within the constraints of the game. Also the user knows that if the monsters are defeated he will receive a reward. So there is motivation, over and above survival.

Quite apart from this apparent correlation with Castronova's criteria, the fact that many such challenges are accepted in WoW suggests that they are fun. It is easy to apply definitions of fun to MMORPGs, of course, but will we see similar applications in SVWs?

Koster (2004) says that games cease to be fun when they become boring. He expands on this truism by claiming that the more limiting structure there is in a game, the sooner it will become stale. Conversely, the more open-ended a system is, the greater its longevity. We suggest that this is why chess has been popular for hundreds of years, outliving early arcade games such as Space Invaders, which immediately gave way to the first in a succession of progressively less constricting virtual environments. Inversely, SL may be stereotyped as not fun because it offers unlimited choices which the user must decide on. Perhaps the open-ended self-direction is so loose in its ludic qualities that it's difficult to recognize.

Koster says that as game players we are very good at "seeing past fiction." Players of Grand Theft Auto do not judge the use and abuse of a prostitute ethically, he says – they think of it purely in terms of game advancement, like PacMan eating a Power-up Dot. Slaying dragons is reduced to the acquisition of points, gold or whatever the extrinsic motivator happens to be. The first time one takes a walk from A to B in a 3D virtual environment like SL it might be a novelty. This novelty eventually fades and new goals and motivations need to be formed.

By and large, the need for a game to offer extrinsic dynamic motivations is inversely proportional to the sense of choice it engenders. Sonic Hedgehog can only run and jump, so gold rings take centre stage; the freshly registered user of a newborn SL avatar probably has a far greater sense of choice, and so there is less need to dangle a virtual carrot before his nose. Ultimately, for all our attempts to classify and dissect them, fun and games are subjective experiences. A sense (possibly illusory) of choice is, therefore, of more significance than whether choices are actually available. This is precisely why the computer's response the 100th time we typed "GO NORTH" in Crowther's text-based adventure game Colossal Cave Adventure was considerably less exhilarating than it was the first time around. In other words, a user can suspend disbelief for a while – seduced, perhaps, by description, beautiful visuals or a stirring soundtrack – but when we see patterns and limitations in a given environment, part of our brain says "Aha!" and, in the cold light of day, what

seemed like free choices become mere branches in a programmer's flow chart. A SVW, like SL, has no patterns like this, so traditional manipulations of motivations and goals may not function in a non-game environment. Every time a user logs into SL the world has dynamically changed.

For an insight into motivations in SVWs we might need to look at other ways to perceive the virtual world. Interestingly, one view is endorsed by Castronova (2008), who describes the findings of Reeves and Nass (1996). Reeves and Nass found that the brain's initial reaction to a media image is to assume the thing depicted is real. It is only later (and we're talking fractions of a second of course) that a higher part of the brain steps in and lets us know that the dragon on screen isn't real. So, as long as the graphics are halfway decent, buildings and avatars in SL seems as real to the users as the chair on which he sits, if only momentarily. Part of the art of modern virtual world design is to protract that moment of belief. There are two possible approaches to this task. One is to set about improving the images, sounds and other stimuli. The cost of high-end graphics machines continues to fall so that the virtual reality once only available in a lab is now accessible by the common personal computer. The present, for SL at least, while quite a technical achievement, falls a very long way short of being visually realistic. For now, there's little that can be done about this.

The other approach to keeping the user immersed is accomplishable tasks that provide challenge but not so much challenge to be impossible to complete. Keeping the users in the state Csíkszentmihályi (1997) calls flow, in which challenges and abilities are carefully constructed to complement one another thereby challenging the player but always in a way proportionate to his/her experience. In a game world these structures are provided for the player but in a SVW the state of flow is far more difficult to define and maintain. So what provides these challenges in SL?

No matter how convincing a virtual world, the user is likely to remember double-clicking an icon to get there. So, even if we put our faith in motion capture technology, surround sound and Moore's Law, flawlessly convincing virtual environments are always mediated by a computer system creating a constant sense of "other" which can interrupt the flow. Perhaps, our criteria for fun therefore may become a measure purely of a virtual world's capacity to engage, and to do so indefinitely, as well as pleasingly.

Perhaps part of this distraction in the virtual world is the other people who inhabit the virtual space with the user. In fact, it could be argued that it is the greatest of all. Boellstorff (2008) quotes an interviewee thus: "No matter how fancy the tool, it comes back to connecting with people." All of this requires an extended look at what is fun in virtual worlds when the game specific elements are removed.

10.6 What Is Fun in a Virtual World?

Fun takes a different path in social worlds than in a game-based world. These paths sometimes take familiar forms by recreating a game system or a traditional role to "game" within the system, but social worlds also have the characteristic of having

things such as interpersonal communication and identity creation take on hedonic qualities. Each of these characteristics will be explored and shown to serve a hedonic purpose in social worlds.

10.6.1 Why We're Not Talking About Games

Another aspect that SL users can turn into a sort of game is that of success in occupational areas. The worlds of business or entertainment are often described as the game. People involved in these areas are said to be "playing the game". The rat race or the world of Hollywood imply that people who understand how the system works attain a level of success which is seen as winning. For example, SL has a vibrant, diverse and dynamic business community full of winners and losers. But is this activity a source of fun in SL?

Using Castronova's definition, certainly businesses in SL have opportunity for great success and failure. The business person is faced with feeding an appetitive desire for running a successful business and perhaps generating actual cash mixed with the aversive nature that is inherent in the risks of running a business. For some individuals, the time and effort taken in creating a business in SL can affect the survival of that business. The SL users' commitment and choices are also integral to the business's survival. Finally, the notion of a virtual currency, in a lower risk business environment that is easily changed and quickly adaptable, creates a playful environment. Certainly all of Castronova's elements that make economies in virtual world's fun would be related to the game of business in SL. There is creation, equal opportunity, competition and an environment full of risks and bargains.

Again though, a very small percentage of SL users run a business and a miniscule amount manage to navigate that business to any level that could be called successful. The vast numbers of SL users must be involved in other hedonic experiences or why would they return to SL. One explanation of the fun being had may be in the very nature of the social world itself.

10.6.2 (Re)creating Games

Users of SVWs take advantage of an over arching narrative and create their own, including game narratives. These games can take the form of actual game mechanics that effect players in the same way an MMORPG would but they can also be similar to "thought" games that are "played" through conversations with players. The goal of each is to create a magic circle within the SVW. A social world like SL, where content can be created, has spawned entire spaces that might be indistinguishable from a traditional video game. As with MMORPG's that fit Castronova's qualities of fun these in-world created games exhibit all of the qualities of fun. This is not to say all of these games successfully create the sensation of fun but they fulfill the characteristics of choices, risk and reward and so have the potential to

be fun. Examples of this type of recreation are the game spaces in SL created for the film I am Legend. In essence, it was a small-scale video game within the world of SL. The "I Am Legend Survival" space had rules, goals and consequences contained in one space but housed in the larger world of SL. The I Am Legend Survival site (http://iamlegendsurvival.warnerbros.com/) is described as "a multiplayer first-person shooter/RPG game playable in the 3D virtual world SL." In the game, you could play a human survivor of the zombie outbreak or a zombie. The players then entered a post apocalyptic New York and competed to complete certain goals and interact with other players.

Similarly, in social worlds games can be created that have a wider magic circle. The role-playing game, The Thirst: Bloodlines (http://www.slbloodlines.com/), is not limited to a specific geographical region but can be played anywhere in SL. There are once again rules, objectives and competition that like the I Am Legend Survival game fits Castronova's definition of fun. Through the wearing of a Heads-Up Display (an appliance created in SL) the players exhibit co-activation activities (through interaction with other players), fight for survival as a vampire and create new vampires, in an interaction layered on top of normal SL activity that could be called play. Part of that play prominently featured in The Thirst: Bloodlines is role-play. The characters, like in some MMORPGs, take on roles that define how they interact with other player in the game. This role-play adds to the playful nature of the game and created more of the sensation of fun.

These two examples are easiest to connect to the notion that social worlds can be fun. The two examples closely mirror the ludic structures that are prevalent in game worlds like MMOs but the majority of SL users do not play these games. Another area where fun could be exhibited in SL would be through using the system to succeed.

10.6.3 Ludification of Culture

The vast majority of interactions in virtual worlds are social interactions and the play of fluid identity creation (changing appearance, clothes and gender). We will suggest these actions are the primary source of fun in SVWs. The social interaction between people has also been compared to games in the past. We are said to "play the game of love". Huizinga (1950) proposed the idea of Homo Ludens or "Man the Player". Huizinga linked play and culture and perhaps SL acts an extreme sandbox for this cultural play. Also, Turkle (1994) suggested MUDs (an early form of textual-based virtual worlds) offered an "unparallel opportunity to play with one's identity and to 'try out' new ones." Caillois (1961) called this sort of social play, paidia, or unregulated play. Steinkuelhler and Williams (2006) found MMORPGs had a playful mood and that may possibly exist in other virtual worlds. Also, Raessens (2006) suggests that internet technologies (including virtual worlds) allow for "playful goals and facilitate the construction of playful identities." Do these social interactions and identity play in social worlds fulfill the definition of fun we are using?

First, personal interaction has benefits and risks implied. User interactions have an infinite number of benefits that seem equally matched with risks. You could learn information from one user that can help you at the same time another user can intentionally deceive you. This certainly sets up a near constant interplay of co-activated motivational systems. Due to the nature of virtual worlds, the user is removed from other users by the situation of the avatars of the users interacting and not the users. This separation allows a comfort zone to be created where co-activation has reduced benefits (interpersonal contact) and at the same time reduced risks (anonymity in actions). This detachment may then allow for experimentation in social interactions (for example role-playing) and identity play. In terms of identity play, SL and other social worlds have almost unlimited identities available. In no physical way do these identities directly relate to the users identity. Just because you are a male user does not mean you have to use a male avatar. In fact, 23% of male WoW users (Yee 2003) and 11% of male users in SL (Bell et al 2009) chose avatars that are female. This virtual gender-bending may happen for a wide-range of causes but it is possible one of them is the co-activational nature of appearing as the other gender.

Secondly, what if Castronova's notion of survival could be interpreted as social survival in a SVW? Social survival would be attained by a series of successful social interactions that lead to pleasurable sensations. Though there is a detachment between users there is ample opportunity for activities and choices of the user that are relevant to their social survival within a virtual world. Through a wide range of communication mechanics the user has a wealth of choices of how to maintain and increase their social fitness. Social survival could easily depend on social interactions but also identity play. Fitting into a community you wish to belong to in a virtual world suggests the play and experimentation with your online identity. For instance, the Furry community in SL is populated by users who make their avatars look anthropomorphic. Many of these users have purposely altered their online identity to connect with another community; one in which they may find hard or impossible to connect with in the real world.

Finally, there is a playful mood and situation to SVWs. Third Places are social gathering spots that are not home or work (Oldenburg 1999). It is not a huge leap from the concept that MMOs are third spaces (Steinkuehler and Williams 2006) to the idea that social worlds, like SL, are also third places – see Chapter 6 by Peachey, this volume. Social worlds and MMORPGs share almost all the same communication mechanics. If people log into WoW to be part of a social scene it is not unexpected that people would log into SL for similar reasons as Boellstorff (2008) suggests. Also if the MMORPG worlds are playful in nature we can recognize social worlds also have that playful nature.

Using Castronova's definition of fun and applying to social worlds, we see that though social worlds lack the ludic game elements in MMO's they have as much potential for fun. The activities in social worlds have the potential to co-activate motivational systems and those activities are relevant to social survival and the user's choices could promote that survival. Finally the colorful, imaginative and infinitely changeable environment, communication mechanics and identity markers create a mood of playfulness in social worlds.

10.7 How Can SL-Fun Be Leveraged for Learning?

So based on our definition of fun, we can say that virtual worlds built with game mechanics, SVWs like SL, can be fun. Can that fun then be leveraged for learning? Recreating game mechanics in SL would certainly do the trick but that is self-evident and defies our hope to support intrinsic learning. A recreation of a game like Oregon Trail in SL may provide a more immersive learning environment but does not take advantage of the other types of "fun" we found in SL.

The identity play allowed in SL offers a wide range of possibilities for learning situations. First, the digital selves we create can be seen as teaching us something about how we see ourselves and recreate ourselves in a virtual space. When a player creates an avatar in WoW they are looking to maximize the game experience. With the almost limitless avatar choices available in SL, how a user creates their avatar is more about themselves than how they will perform in the world. Also with the constant ability to change that avatar in SL (an option not often allowed in game worlds like WoW), identity experimentation can take place. This fluid identity can allow the user to step outside of their comfort zone and try out new identities. This allows reflection back onto their existing identities (both physical and virtual). Arguably, experimentation in a virtual world can occur without the constraints of "real world" consequences or as Gee (2007) suggests, in the context of digital games, operate within a psychosocial moratorium. Within virtual worlds students, lecturers and indeed all those who are engaged in the learning experience have the freedom to experiment with their digital identity, or persona, as they learn. This means the traditional notion of the "sage on the stage" will not work in SL. This freedom of fluid identity affords the opportunity to experience from multiple new perspectives or roles. Virtual worlds afford the potential to examine issues of fluid identity and the slippage between persona and self affords a reflective process that can serve to encourage self-awareness, examination and growth (Turkle 1994). In addition, we understand the ability to experiment with one's own identity can increase tolerance for the identity of others who might be different (Turkle 1994).

The root of the SVWs is the social interactions mentioned earlier, and if these interactions are a source of fun in SL they should be exploited to assist in learning environments. Instead of being alone in the learning situation, the learner can communicate, teach and learn from other avatars. This education with others allows the learning situation to not be an isolating incident but receive all the benefits of community and co-operation.

Taking Bisson's characteristics of fun (relative, situational, voluntary, and natural) and applying them to SL shows similar results. First SL is a voluntary situation that is decided upon by the user. Certainly any learning environment in SL should also be natural and organic rather than forced and hindered by structure. Also, Bisson and Luckner's attributes match up: SL is an environment that works best when social inhibitions are lowered. Also the stresses of everyday life (food, money, family, traffic) are all removed in SL. This aids in creating that state of relaxed alertness while sitting in front of a computer and flying through the virtual world.

With this in mind it is easy to see why recreating traditional academic environments in SL is neither fun nor effective. A traditional classroom fosters no games, relies on standardised identity and frowns on socialisation rather than promoting it. The virtual SL education environment should almost act in a contradictory fashion by *encouraging* play with identity and *requiring* social interactions. Learning spaces should not be empty but places of congregation and interaction.

10.7.1 Moving Forward

The question we began with is if the game elements are removed from a virtual world can it still be a place to link learning with fun. To begin we looked at the connection of learning and fun to see what characteristics could be drawn out. Then we covered different definitions of fun and how they could relate to learning specifically in the areas of goals and motivations. These were then compared to definitions of fun (especially ones that related to virtual worlds). SL, where there are no game structures (unlike WoW), was then observed to determine what kind of fun activities were related to fun, and finally there were suggestions for leveraging this new concept of fun to learning situations in virtual worlds.

Though we cover some recommendations, the state of current education in SL relies too heavily on the notion of seriousness rather than frivolity. Choosing the exact opposite path (by making activities based around identity and social in nature) may create a more fun learning environment in SL and foster return trips and lingering positive emotional effects.

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