

UK university technical support for Second Life developers and users

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Abstract

Background

Numerous surveys, articles, ephemera and online information sources indicate that Second Life has been the predominant virtual world, for educational purposes, in UK universities for the latter half of the 2000s. However, the infrastructure required to operate Second Life presents a number of technical concerns within some universities, such as PC graphical and processing speeds, the ability to update the viewer software, and access for groups of users from the same physical location e.g. one teaching lab. These have created serious issues for many academics and students wishing to make use of Second Life in their research or teaching.

Purpose

This article examines how these technical issues have been encountered, and in some cases overcome, by academics using Second Life for research or student teaching. From the data provided by a series of qualitative surveys over two years, trends in technical issues within the UK higher education sector, and their commonality, are examined.

Sources of Evidence

The evidence base used in this article is the six 'snapshot' surveys of virtual world use, funded by the Eduserv Foundation. These surveys, which started in mid-2007, attempt to provide an overview of how virtual worlds are being used for teaching and learning in UK universities and colleges. The informal, open and often frank responses of many academics to the surveys have provided useful qualitative information about their experiences in using virtual worlds within UK universities.

Conclusions

The data collection suffers from a lack of information from academics who were unable to overcome technical barriers in their use of Second Life and simply 'gave up'. The actual collected data shows that technical capabilities, as applicable to Second Life use, and support differ markedly between UK universities. However, the surveys indicate that such barriers, for persistent academics, do not provide a permanent obstruction to virtual world use in many UK universities. The more recent of the surveys generated a markedly smaller proportion of data concerning these barriers, indicating that many academics who responded to several surveys had overcome or worked around the obstacles, or that the technical capabilities offered by their host university had moved closer to that required to use Second Life.

Keywords: Second Life; virtual world; university; college; accessibility; support

Identifying virtual world use in UK universities

Virtual worlds are not a new form of technology. Second Life (hereafter: SL), the virtual world created and maintained by Linden Labs, celebrated its sixth birthday in the summer of 2009. Many other virtual worlds have emerged, are being developed, or are ‘maturing’ with several years’ use; Robbins (2009) compares 70 such environments in a faceted study.

By 2007 it was evident from anecdotes, press cuttings and blog postings that virtual worlds were being used in the UK education sector. However, the overall picture was very unclear, with (at the time) a lack of online indexes or publications dedicated to such activity. In 2007 a series of snapshots, funded initially by the Eduserv Foundation and latterly by Eduserv Research, attempted to identify virtual world activity within the UK higher and further education sectors (basically, the colleges and universities of Britain and Northern Ireland).

The snapshot series is formally funded through to the end of 2009, though will continue in some form into 2010. Data is collected for each snapshot report by one qualitative, questionnaire-based survey approximately once every six months. The nature of the questions has changed between surveys to try and limit data collection issues. These include:

- Not every academic using a virtual world wants to respond, or for his or her developments to be public. Some academics are developing ‘under the radar’ due to technical, funding or contractual issues. They are disinclined to respond in case knowledge of their activities has a negative impact on their work or career.
- Some academics do not respond to any surveys or requests for information.
- A small minority of information received has turned out to be exaggerated, or in a few cases completely false. Examples of this are academics who claim to have ‘developed’ infrastructure within SL, but on visiting all that can be seen is an empty, un-terraformed island.
- Academics who have been defeated in their efforts to use virtual worlds are very difficult to identify, as they have moved on to other academic endeavours. Therefore, getting what could be very valuable information from this demographic has been particularly difficult.
- There is an inclination with some respondents to use the snapshots to ‘rant’ or as a ‘soap box’, especially if they have encountered real or perceived problems in their work. However, the awareness that all of their comments will be in a public forum has probably limited more explicit complaints.
- Survey responses provide a ‘one-sided’ view of contentious issues within specific universities, containing just the SL developers’ comments. Technical support, and other

services, were generally not asked for their response as this could inflame any local issues and cause problems for the developer. In addition, as part of the fifth snapshot survey, the technical services of nine universities were contacted (in a neutral manner) and asked for their experiences of SL deployment. Only one (Oxford University) responded.

- Academics in some institutions are free to respond to surveys, whilst in others need to go through a higher authority, or a press or media unit.

Initial findings

The main findings of the first snapshot in July 2007 and an updated version two months later were that:

- Virtual world use was happening within a significant number of universities. In the first survey, we identified actual development, teaching and learning, or research work involving virtual worlds in 42 of around 110 UK universities. By the early summer 2009 survey, such activity had been registered in over 90% of UK universities, in some cases happening across many departments and groups in the same institution.
- SL was by far the preferred virtual world of choice. More instances of SL use were found than instances of use of other virtual worlds put together. This trend continued through all the snapshot reports.
- The main problems in using SL for teaching and learning in a university were a lack of time and funding, and technical issues within the institution.

The time and funding problems are common to many academic pursuits. However, the technical limitations and problems of developing within SL, or using it for teaching and learning, were frequently mentioned by respondents to all of the snapshot surveys:

Currently we can't access SL from the university campus or machines on the network. IT are trying to find a solution to this. (Gilly Salmon, Leicester University, quoted in Kirriemuir (2007a), 16)

The Computing Services are at time of writing still not allowing SL to be installed in the managed computer labs. (Sheila Webber, University of Sheffield, quoted in Kirriemuir (2008b), 51)

Since they current[ly] refuse to put SL on the 'managed desktop', I cannot describe it as supportive. The security is such that the 'data stick' work round cannot be used, and except for departments (like us) who have some computer labs and technicians of our own, all the computers are 'managed desktop'. This is obviously a major barrier to any further SL or virtual world take-up in the university. (Anonymous respondent, quoted in Kirriemuir (2008a), 30)

Using SL and other virtual world environments requires far greater technical commitments than using most other online technologies in teaching and learning. For

example, use of the popular messaging service Twitter requires just a web browser on a low specification PC or Mac, as does the social networking service Facebook. To use SL requires a relatively high performance machine (in terms of both the processing power and graphics card), as well as the ability to upgrade the viewing software. Doing group work within SL requires port access for multiple computers, in addition to audio input and output capabilities (for speech).

The snapshots provided an unexpectedly useful function in that academics could see who was having similar technical problems and, more importantly, who had overcome them. In addition, it became possible to identify ‘fertile’ universities, such as the Open University, Edinburgh and Coventry, where there were few technical restrictions on virtual world use, leading to much activity using this particular technology.

Technology-related issues

Comments from respondents about technical issues fall into four overlapping categories.

1. Updating the SL viewer

The viewer is the client software required to view the activities of your avatar in SL, as well as to develop any structures within the environment. Whereas many other internet-based applications, and some virtual worlds, just require a web browser, this extra layer of software can complicate usage in an institution:

The key to making a virtual world usable for an educational establishment is accessibility. In the case of Second Life, people have to download the client and register an account, which has proven to be a confusing process for (some) staff and students alike. We have gone to great lengths to streamline this process to the point of installing the SL client in our Learning Resource Centre and using the ‘Reg API’ (registration assisted programming interface) provided by Linden Lab to allow students to create accounts from inside the university network. (Andrew Marunchak, University of Hertfordshire, quoted in Kirriemuir (2009a), 40)

Recently, updates of the viewer software have been optional (but still recommended for optimum use of SL). However, previously some viewer updates were mandatory in order to use SL, and with little or no notice.

Networks must be upgraded beforehand and servers running. We had some IT issues as SL underwent an upgrade on the day and prior notice was short. (Elinor Clarke, Coventry University, quoted in Kirriemuir (2008b), 35)

Even when academics had access rights to update the viewer themselves, this was still problematic when it was required across a whole lab of PCs with little notice before a scheduled class:

Getting access in computer labs presents problems, notably with the very regular software upgrades to SL. I'm not sure realistically whether it's feasible for student machines in the future, barring a sea-change in the way they roll out patches. (Dr James Fearnley, Loughborough University, quoted in Kirriemuir (2008a), 34)

We had firewall issues to start with but now that these are resolved it runs fine on most of the machines – only issue are the mandatory upgrades – I always need to check before scheduling a session and get technicians to load them – they are very prompt in doing this as long as I spot that there has been an upgrade in time. (Dr Julia Gaimster, London College of Fashion, quoted in Kirriemuir (2008a), 32)

Some universities let academics do this:

Our Computing Services were happy to mount the client software so long as I do the updating. (Anonymous respondent, quoted in Kirriemuir (2008a), 29)

Others did not:

Further discussions with our central computing department have still not led to installation of the SL browser on the managed desktop; this is a barrier to further use. (Sheila Webber, University of Sheffield, quoted in Kirriemuir (2009b), 27)

Some academics used a memory stick workaround to update the viewer software where there were technical or access limitations:

The IT support has been helpful as far as they are able to do so. There are some infrastructure issues with using SL in the institution. That is, the PCs are locked down and SL requires regular updates so therefore can really only be run off a memory stick. (Crispin Dale, University of Wolverhampton, quoted in Kirriemuir (2008b), 47)

One solution to resolve viewer update issues is to automate the process as much as possible:

The support staff in the School of Contemporary Art & Graphic Design have been fantastic. Not only have they installed Second Life in our main Mac suite as part of the standard build, but they have even written a script to automatically update the client when a new version is released. (Ian Truelove, Leeds Metropolitan University, quoted in Kirriemuir (2008a), 33)

2. Technical capability

Earlier snapshot surveys drew negative comments about the basic capabilities, e.g. RAM and processor speed, of PCs in many universities:

We wanted to run an event at the School of Education but their machines were not powerful enough for SL. (Shirley Williams, University of Reading, quoted in Kirriemuir (2008b), 36)

Main issue for us is accessibility in the real world to access the virtual world i.e. computers and bandwidth. (Martin Biron, College of North West London, quoted in Kirriemuir (2008b), 38)

The high demands on computers means there is a requirement for computers to catch up. Not all student/university PCs can handle the high demands which make it prohibitive. (Andy Beggan, University of Nottingham, quoted in Kirriemuir (2008b), 44)

The machines in our institution are generally under spec'd for SL. (David Lee, University of Hertfordshire, quoted in Kirriemuir (2008a), 34)

The speed of updates for computing hardware, software and functionality, required to make the fullest use of SL, also drew negative comment from academic developers in UK universities:

In this university? More adaptability and flexibility from IT. (Ferdinand Francino, Glasgow Caledonian University, quoted in Kirriemuir (2008b), 44)

IT involvement is slow, partly due to funding and other issues like network support and availability of environment within the university. (Remy Olosoji, University of East London, quoted in Kirriemuir (2008b), 50)

Technical services drag their feet – we still don't have voice chat despite continued request and our project reports identifying this as an important facility e.g. for virtual tutorials. (Anonymous respondent, quoted in Kirriemuir (2008a), 29)

Encouragingly, the two most recent snapshot surveys draw noticeably fewer comments about inadequate PCs, and several previous correspondents on this point have said that their institution now has more computers and labs able to acceptably handle SL.

3. Port, firewall and proxy issues

Opening up sufficient IP addresses for access to SL from a group of computers has been a problem at many universities:

I'm also very grateful that our technical helpdesks are all on board with being encouraging about hardware and kit to cope with SL. Slightly less useful that LL [Linden Labs] can whitelist 5 IP ranges for us when we have trillions. (Kate Boardman, University of Teesside, quoted in Kirriemuir (2009a), 38)

In the case of Linden Labs and SL, making setting up accounts from the university network less problematic. The issue of only having a five account maximum and two on any day, unless specific IP addresses are set, is a real pain! (Dr Liz Falconer, University of the West of England, quoted in Kirriemuir (2008b), 38)

Proxies and firewalls have also presented access problems within universities:

Networking has been an issue when it comes to proxies. (Savvas Papagiannidis, Newcastle University, quoted in Kirriemuir (2008a), 32)

The University IT Committee and team have been very supportive, and now all necessary firewall ports are open on UOPNET for anyone to access SL on-campus. (Maged N Kamel Boulos, University of Plymouth, quoted in Kirriemuir (2008a), 33)

We can access the Second Life world through the OU Guest Network. It is blocked by the firewall on the OU intranet. The digilab in the library provides Macs which can be used with the Second Life World. (Peter Twining, Open University, quoted in Kirriemuir (2008a), 32)

Other technical barriers present themselves to academics, sometimes at short notice. As SL develops and more functionality is added, e.g. the relatively recent addition of voice, so the problems of making this functionality available within some institutions reoccurs:

There needs to be more freedom of networks and connectivity from inside institutions to enable more staff to experiment, therefore making the tools more ‘mainstream’. (Gilly Salmon, University of Leicester, quoted in Kirriemuir (2008b), 45)

The main issues were firewall related, as we already had suitable hardware. A standard form was required to request firewall changes, and these were applied. Some issues took a while to resolve, but we now have full access including voice – but not to Shoutcast audio streams (which are not hosted by Linden Lab, and do not always use standard IP port numbers). (Daniel Livingstone, University of the West of Scotland, quoted in Kirriemuir (2008a), 33)

Our ITS colleagues have been very helpful in enabling access to SL for all computers across the university’s network. We can’t get voice enabled though, as there are security concerns about the nature of the connections (peer to peer?). (Dr Liz Falconer, University of the West of England, quoted in Kirriemuir (2008a), 32)

4. Lack of knowledge of virtual world use in education

The IT departments in some institutions are reported as still being unaware of the use of SL in education:

Worryingly there has also been resistance from within the IT Management and Development teams who do not see any value in using Second Life for education. Indeed, the college network does not allow access to SL. However, slowly but surely attitudes are beginning to change to the extent where we are in talks with the corporation’s IT technicians and management to change the network so that it finally allow access to students and staff at HE level. (Bex Ferriday, Cornwall College St. Austell, quoted in Kirriemuir (2009b), 27)

Should the IT department be aware of the use of SL within education? Arguably yes, as many other institutions have used SL for teaching and learning for several years. However, there are many online services and technologies used in education, and should it be taken ‘as read’ that your institution’s IT department is up to date, or can keep up to date, with all of them? In addition, a unit consists of different people with different interests and knowledge of different technologies; there may, therefore, be an element of ‘luck’ in an academic requesting help from a technical support officer who happens to possess knowledge of SL use in education.

Responses of this kind also raise the question of who decides whether SL – and other technologies – can be used within a particular institution.

Recommendations

As well as examples of technical obstructions and limitations, academics have provided some solutions, either as part of the snapshot surveys or in informal correspondence afterwards.

1. IT awareness of virtual worlds in teaching and learning

It is disappointing that, in a minority of UK universities in 2009, academic contact points within some university IT services still question whether virtual worlds such as SL are relevant to teaching and learning. This is all the more surprising considering the high profile of many such uses of SL within the higher education sector, and indicates a problem with the awareness of emerging, technology-based teaching and learning practice.

It is unclear what (more) can be done here, due to the large amount of conferences, websites, reports, mailing lists, blogs and other media dedicated to the use of SL in education. Either those who question whether SL is relevant to teaching and learning are deliberately avoiding the evidence, or there is some other reason for their reluctance to provide access within their institution. If none of this information is filtering through to the IT services of a particular university, then one of the few approaches left is – as has been done many times – for the academics inside the university to educate the IT services department, showing how SL has been successfully used in other institutions for teaching and learning.

When this fails, another approach by some academics is to enlist the support of senior university management. This is possibly more confrontational and certainly more political, distracting the academics from their core roles.

2. National minimum standards for IT innovation support

At a Joint Information Systems Committee (JISC) learning and teaching workshop in 2008, the requirement of minimum IT standards in universities was raised with a Higher Education Funding Council for England (HEFCE) delegate. An SL developer at the workshop explains the rationale:

HEFCE have proposed that as part of their elearning strategy that minimum standards for support provided by IT service departments for innovation could be imposed on universities. These minimum standards should include opening up the infrastructure to enable Web 2.0 applications, providing sufficient bandwidth for applications and the roll-out of Second Life and other virtual worlds. If HEFCE did include these minimum standards then this would turn around the role of elearning in HE, not just for immersive virtual worlds but for a whole range of technologies. (Mark Childs, Coventry University, quoted in Kirriemuir (2008b), 47)

At the time of writing, the minimum standards of support have not been written into a strategy by HEFCE. Such a strategy would provide a baseline for all academic institutions to meet and follow, and remove the situation where the ability to use virtual worlds by an academic depends mainly on the local technical infrastructure and support.

3. Flexibility of high-end IT provision in universities

While many university students now possess their own desktop PCs and, increasingly, laptops, it is still unrealistic to expect a group of students to own computers with all of the capabilities required to participate in an SL teaching and learning session. Trying to navigate around the SL environment on many notebooks, for example, is difficult. Consequently, a computer lab, with standardised (or a minimum standard of) graphics cards, processor power and the latest version of the SL viewer, is currently the only realistic method of taking a class in SL.

A laboratory of high-end performance PCs, even bought through an educational discount, will cost a substantial amount of money. Because of this, rather than upgrade every PC every year – which is unfeasible given budgetary constraints – most universities upgrade their computer lab equipment on a rolling cycle, resulting in some labs being able to offer functioning SL access whilst others cannot.

Academics have suggested three solutions to this issue:

1. Students should be advised on a minimum specification for any laptop or PC that they own, though this approach may not be feasible or even ethical. Is it fair to demand that a student upgrade to, or buy, a high-end laptop just so they can take one particular course module that uses SL?
2. Laptop banks. The computing services of several UK universities, such as Edinburgh Napier University, the University of Nottingham and Southampton Solent University, already provide laptops for hire to students; further details can be found in the References. The IT services of an institution could maintain a collection of high specification laptops for use by any department. These would have the latest SL viewer installed, and be used by any class within the institution, across the campus Wi-Fi network, for virtual world work.
3. Lab use flexibility. Some universities are relaxed about lab access; for example:

We are one of the few universities in the country specifically set up to train students in computer game design. These facilities are used by other departments to teach and do development work in Second Life. (Simon Bignell, University of Derby, quoted in Kirriemuir (2008a), 33)

4. The practice of university departments ‘owning’ a PC lab, which only students within that department can use, still occurs in some universities. This can result in the

specification of a PC being dependent more on how well-funded a student's department is or how quickly IT services upgrade the lab equipment, than on the needs of the student. A change in practice towards matching the needs of a class with the technical capabilities offered by a lab – irrelevant of which department the class is in and which department the lab is based in – would provide more flexibility. Such a shift in practice would require significant cultural, practice and attitude changes within some institutions.

4. Greater production of support materials and software by Linden Labs

The developers of SL already have various material on their website pertaining to educational use, such as the Second Life in Education wiki, which contains various resource materials and a descriptive collection of SL uses in education, and the Second Life for Educators website which provides directories of support services and organisations. These provide a considerable amount of background material and evidence to SL being used, successfully, in education.

However, there is a lack of materials directed at particular influential demographics within academic institutions. For example:

- Documentation aimed at IT services, detailing the requirements of operating SL on a single computer, on a lab of computers, and across an academic network connected to the internet.
- Examples aimed at senior university management, from a cost perspective, showing the fiscal merits of teaching in virtual worlds e.g. lack of building expense, and of holding academic events in these environments – no travelling costs, reduced CO2 emissions.
- Documentation showing the possibilities and advantages of virtual teaching and learning in a global student 'marketplace', where universities are not physically restricted to where their students are.

While it is appreciated that universities function differently in different countries (and, as the snapshot surveys have shown, even within the UK), such materials may assist academics who are facing technical challenges, in that they help them make the case for virtual world use in their university.

Additional methods of providing access to an SL environment could also be considered by Linden Labs; for example:

A self contained island plus client on a USB memory stick that runs on any standard university PC or Mac would be very useful. (Ian Truelove, Leeds School of Contemporary Art and Graphic Design, quoted in Kirriemuir (2008b), 36)

Conclusions

It became rapidly obvious, when collecting data from the surveys, that there was little uniformity between universities; the small amount of data collected from colleges makes it difficult to generate any comparisons with confidence. IT capabilities and support differed markedly between universities. In some, virtual world activity was not only possible but also actively encouraged by technical services. In others, the default position for using all but the simplest internet-based services was 'no' with a strong case, or lobbying, needed for access and permission.

Even within the same university it is possible for academics to have different access to technical facilities and online services. This is not surprising considering the ubiquitous nature of the PC and that significant upgrades across a whole institution would need to be carried out in stages, as funding and manpower permits:

Computer Services did the first install. At the moment only a subset of our centres can run the client, though this is expected to approach 100% next year. (Dr Peter Miller, University of Liverpool, quoted in Kirriemuir (2008a), 32)

There have been barriers to making SL available on site, not through deliberate hindrance, I would say, but because of technical or logistical reasons. The technical team are willing to upgrade the graphics cards and install SL in the labs but have to do so as part of the rolling schedule of lab upgrades, which has slowed down the process. They have been keen to find workarounds wherever possible, such as installing SL in a small Mac lab that we have in the School until it can be put in place in one of the larger teaching labs. (Cheryl Reynolds, University of Huddersfield, quoted in Kirriemuir (2008a), 33)

We now have SL installed on at least one open access lab per university campus (Edinburgh is spread out over many campuses). There are still some departments that have firewall issues, and have found it difficult to have the relevant ports opened, but we are working on those. (Fiona Littleton, University of Edinburgh, quoted in Kirriemuir (2008a), 33)

A lack of uniformity is also evident from academics responding from the same institution. This particular response is from the autumn of 2008:

[We are using Second Life for] teaching first year Computer Science students how to build and design objects and scripting. (Dr Judy Robertson, Heriot-Watt University, quoted in Kirriemuir (2008b), 6)

However, nearly a year **later**, this comment was received from an academic in a different department of the same institution:

On top of this my computer in my office is completely locked down and I can do nothing, I am not allowed to have Skype ... I cannot use Elluminate, I cannot use virtual classrooms, and so on. My research into virtual worlds (Second Life) is done at home and I had to buy a new computer for there because my work one has no access, is far too slow ... and it is not allowed anyway. (Anonymous academic, Heriot-Watt University, quoted in Kirriemuir (2009b), 26)

The only general pattern which was identified was that teaching, learning and development using virtual worlds tended to be easier within newer universities. This is not always the case; some relatively new universities have insufficiently funded technical infrastructure, while 'older' universities such as Edinburgh have made extensive use of SL and other virtual worlds. However, when one looks at universities where there are examples of virtual world use in several departments, most of these are ex-polytechnics. In addition, it is often the oldest of the UK's universities where there is little or no public virtual world activity.

Overall, the general trend is positive. Many of the respondents to earlier snapshots – even those who have experienced significant technical problems – are still using virtual worlds within their teaching and learning activities. It should be also borne in mind that there have been many successful examples of SL use in UK universities. Several universities, most notably the Open University, are into their second or even third year of curriculum-based SL use.

In some cases, these SL 'success stories' are because the university provides adequate computers, technical support, and access to SL. In other cases, it is because academics have been persistent in getting the technology and support they required, or have found workarounds, e.g. working off-site, or using their own equipment. Many of the academics who have described problems, and been quoted in this article, found solutions to their problems.

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Biographical notes

In the 1990s, John Kirriemuir researched and worked at a number of digital library research centres in UK academia. Around 2001 he became a self-employed researcher, specialising in the use of game-based technologies for educational and other 'serious' purposes. Since mid-2007, much of his work has involved identifying examples of virtual world use for teaching and learning within UK universities and colleges; this is carried out through the Virtual World Watch service, funded by the Eduserv Foundation.

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