

# Navigating the Labyrinth: the technical trials and misadventures of bringing virtual worlds into a government secondary school

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## ABSTRACT

In this paper we present the technical obstacles encountered by a project team seeking to embed virtual world-based activities in a government high school. In doing so we outline a number of broader issues connected with working with proprietary technologies, access and equity, working with IT bureaucracies and systems, and engaging disadvantaged young people.

## Author Keywords

Digital divide, engagement, virtual worlds, Second Life, access, equity, disadvantage

## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

This paper can be seen as a case study, a cautionary tale, or a four-page airing of the frustrations that can accompany the use of new technologies. We hope it will help to explain why people are sometimes wary of adopting new technologies, but we also hope to convey that, if a technology is worthwhile, many problems can be overcome with some tenacity and lateral thinking. Lastly, we would like to discuss issues of technology-related access and equity that emerged during the project.

In this paper we describe the operational issues encountered by a team working on a three-year action research project. The Avatar Project ran from mid-2006 to mid-2009 and involved a small team of Victoria University researchers and practitioners working with teachers from an inner-city government high school to embed virtual world-based activities within Year 9 and 10 Information Technology classes. This school, which we shall call Cityscape High, has a high proportion of underprivileged and refugee students, particularly from countries in the Horn of Africa.

Although the project's primary research focus is participants' use of technology and how this affects their

sense of identity, agency and connectedness, a secondary theme emerged from the data: that of the effect on project outcomes of *trying to get the technology to work*. This emerged consistently from the data, which included material from two schools (interviews, focus group transcripts, observations, post-workshop reflections, textual analysis and an adaptation of visual sociology eg images and digital comics) and whose analysis drew upon a range of theoretical (grounded theory, naturalistic inquiry) and analytical constructs (Denzin, 1989).

## BACKGROUND

In early 2006 Victoria University (VU) received funding from the Victorian Health Commission (VicHealth) for a three-year action research project to study the effects of 3d immersive technologies and web-based collaboration tools on the social connectedness of underprivileged young people. The project began as proposed: we deployed computer games technologies (the editor bundled with the Unreal Tournament 2004 game) to create a 'modded' multi-user environment for participants, with the assistance of staff and students from VU TAFE's computer games program. This, it was planned, would be complemented by an online community custom-built by VU web developers.

Participants would be drawn from service providers working with marginalised young people in the west of Melbourne. These young people would work closely with our games teachers and students to develop their online environment. Mentors would be chosen by and from these young people, and these mentors would lead online discussions about development of the environment.

A matter of weeks into the development process, technological developments in the broader world made us rethink our assumptions about the rollout. Virtual worlds, primarily Second Life, were quickly becoming popular and easy to use. People could access Second Life remotely via the web through a free client without needing to install other software. They could easily create a customised avatar and build their own in-world assets, instead of relying on technical experts in 3D development to do it for them. Lastly, and importantly, a Second Life-based environment offered the possibility of outlasting our project and continuing into the future due to its ability to involve others in Second Life. So out went the initial plan to involve computer games staff and students, and in came a Second Life facilitator and expert.

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At the same time the web was rapidly evolving into a platform for peer-to-peer communication, with social networking services becoming increasingly ubiquitous. Our observations of our TAFE students' activities and habits, which was backed by research (Jenkins, 2006; Bruns, 2006; Boyd & Heer, 2006) told us that young people were already busily using these services, and that it would probably be more effective for us to tap into this rather than develop our own platform. As a result, we created a presence within the online environment that most of the young people we knew used: MySpace.

As it turned out, the MySpace page also proved to be under-utilised. We believe this was for at least three reasons: Second Life itself offered a range of inbuilt communication tools, most students' online communications tended to be facilitated through existing messaging services, and we ended up working with different groups of young people than originally planned.

Whereas we had planned to engage an extended group of young people sourced from a range of youth services, we soon found this problematic due to the difficulty of maintaining group consistency and cohesion - a situation further exacerbated by technical glitches and lags in access to the virtual world. As a result we changed tack and decided to work instead with pre-existing groups of disadvantaged secondary students within a controlled classroom setting, later expanding our activities to working collaboratively "in-world" with students from other schools in Melbourne and around the world.

As a result of working in a structured classroom environment, the need for remote online communications was reduced since all participants were sitting in the same room. The decision to work in a school setting involved a trade-off between coherency and 'doability', and the fact that we may have been missing out on working with some of the most disadvantaged young people who had fallen through the cracks of the education system and were now being supported by youth services. However, seen in another light, working with teenagers who were still at school meant we could try new approaches in working with at-risk young people before they became entirely lost from the education system.

So now we were set to go with our project? Not quite.

### **A PLACE TO CALL (VIRTUALLY) HOME**

Our decision to choose Second Life had benefits but also a range of issues. These issues consumed project resources and stopped us from operating 'in-world' for around seven frustrating months.

Before going on to discuss the issues related to our use of the teen-only Second Life environment, it is also worth mentioning two points. Firstly, our other university activities within the adult Second Life world (through an island purchased by our university) took place as planned, although technical issues such as internet access lags reduced the engagement level of students.

Secondly, access to appropriate Second Life 'real estate' does not come cheaply. In 2007 individuals could access the adult Second Life (or 'Main Grid') for free. This

access included a small allocation of space to build assets, buildings and the like. However to gain access to a significant amount of space where group activities could take place, as well as exercise control on permissions, one needed to either purchase a Second Life 'island' or dedicated space within the world. The initial half-price cost for educational institutions was around \$A2500 at the time (payment is in US Dollars so amounts vary according to the exchange rate) as well as a monthly 'land fee' of roughly \$150. It was possible to lease space from other Second Life 'land owners' for less, but then one was at the mercy of the owners - if they disappeared or didn't pay, your project environment may have disappeared too.

This expense raises issues of access and equity. As the project progressed we were not surprised to find that almost all the schools we encountered doing work in Second Life were elite private colleges. Cityscape High's involvement with Second Life was only made possible through the external funding our project had brought to the school. Since one of our findings was that virtual worlds had the potential to re-engage some of the school's most disaffected young people, this may be seen as one manifestation of the 'digital divide'.

Another issue was the divide that Linden Labs (the creators of Second Life) had built between their Main Grid and 13-18 year old ('Teen Grid', or 'Teen Second Life') environments, and the difficulties we had gaining access to the Teen Grid. These two worlds are entirely separate, and it is not possible for one's avatar to move between them, nor to transfer assets from one to the other. Whilst this is useful in principle, having been designed to ensure that that Teen Grid activities are protected from undesirable adult influences, it does serve to sharply delineate activities undertaken with under 13s, 13-18s and over-18s, leading to problems when working with mixed-aged groups.

To access the Teen Grid, Linden Lab's default vetting process for under-18s involves checking the applicant's SMS-enabled mobile phone or a Paypal account. The mobile option, however, only works for North American phones. We found this out after we had bought our island, leaving students without access. Subsequent enquiries to Linden Lab were issues in themselves: customer service contact details and processes were buried within the Second Life website and it appeared to be 'pot luck' about whether or not emails were answered, and, if so, when. Anecdotally, this seems to be a common experience and for us resulted in a feeling of helplessness since we had no way of resolving these issues independently.

Although we encountered these problems in early to mid 2007, some are still continuing at the time of writing according to the Wikipedia article on Teen Second Life ([http://en.wikipedia.org/wiki/Teen\\_Second\\_Life](http://en.wikipedia.org/wiki/Teen_Second_Life)). This does seem to point to a general issue about Teen Second Life service to customers not located in North America.

When eventually we did receive an emailed response to our queries from Linden Lab, we were told there was no solution to this problem, even though we had paid for

access, and that we would need to hire an external consultant at a fee to create our own registration process.

This, however, would mean that our young people would not be able to travel to Second Life's teen-only 'mainland'. In effect we were told that we would be creating our own Teen world within Second Life, but that anyone in our world could not communicate with anyone in the main Teen Second Life world. Had we succeeded in making this option work, the program would therefore have ended up quite different from what was originally planned, which was to create a space for expanded interaction that could sustain itself beyond the life of the project through the ability to interact with other communities of young people.

The lesson here is that in technology-based projects, the technology itself - its structures, interfaces, processes and rules, influenced by the agendas, assumptions and sometimes oversights of its creators - can drive a project's outcomes and final shape. Technology-driven interactions are mediated by processes and restrictions that can be arbitrary in nature, for better or worse. And unlike other kinds of projects, it can be hard to make alternative plans. If you're locked out of the environment you've staked your project on, there is very little you can do. You are at the mercy of the customer service representatives responding to your enquiry. This can be disempowering. It represents a major risk and perhaps explains the reticence of some to embrace new technologies in their activities.

As it out turns out, the planned new option did not work either, even though our paid consultant was responsive and helpful. A technical error by Linden Lab prevented us from connecting to their servers and signing up students, and they did not respond to our support requests. This was never resolved, and still appears to be an issue at the time of writing according to the Wikipedia page on Second Life.

Another issue that complicated project delivery was the process of gaining access to the Teen Grid by the (adult) research team. This involved paying a Linden Lab-authorized company to undertake background security checks on team members. This took some months but was undertaken with a minimum of fuss. However at the end of the process we were still not able to access our world, which we found, after some investigation, was due to lapses in communication between Linden Lab and the vetting company about the clearance status of our workers.

Finally, in November 2007 and in a state of exasperation, we scouted for other options. Eventually we found and teamed up with Skoolaborate ([www.skoolaborate.com](http://www.skoolaborate.com)), a self-contained Second Life world for secondary students run by an educator from an Australian private girls' school. This world is similar to the one we would have built if our work with the external developer had borne fruit. This solved our problems, as this world's administrators were able to sign on young people and workers through access to the world's API. Our project worked within this environment until the end of

classroom activities in mid-2009. It is worth noting that the creator of this environment had personally flown to Linden Lab's US headquarters to facilitate the setting up of his world, in itself a considerable investment.

The next stage for our virtual world activities is currently taking shape through our current projects: the building of our own world using the Open Sim code base and augmented by a range of customised tools ([www.tugengine.org](http://www.tugengine.org), [www.osvr.net](http://www.osvr.net)). This will ensure that we will maintain control over the environment and access to it, will be able to work with groups spanning the over and under-18 divide, and will not be subject to administrative and policy constraints that may not suit our cohort or way of working (as has sometimes been the case with the world within which we have been working).

## SCHOOLS AND SYSTEMS

Apart from the problems with the virtual world technology itself, a number of other issues came to the fore once we began to work at Cityscape High.

The following extract from a blog post from our technical leader, Dale Linegar, was written in November 2007 and outlines the range of concerns we were facing:

*We ran into several issues as we tried to move beyond a basic demonstration and involve the kids on a deeper level including:*

- *Bandwidth – It was so bad that many of the students avatars were appearing unclothed (not so much naked as like a blank Barbie doll) and movement within Second Life was impossible.*
- *Graphics cards – The computers were not really good enough to run Second Life, and due to a combination of borderline graphics cards, limited RAM and slow processor speeds they crashed often.*

*Unfortunately this meant the experience the kids had was not very engaging at all, very similar to trying to use the internet on a 56k modem. Many were migrating back to the net during class, playing flash games and the like online because at least they ran properly (Pacman and Myspace were commonly used).*

*Other issues which were going to effect us continuing the program included the fact that the School network in Victoria has the ports Second Life requires blocked (security reasons) meaning that generally, high school students cannot access SL.*

As the following section of the post explains, we did devise solutions to these issues, but these put a serious dent in the project budget, again raising issues of access and equity in regard to the use of technology.

*Our conclusion from this experience was that we needed to look into a 'mobile lab' system which would allow us to take Second Life wherever we went. At that point we had one wireless broadband modem, which we traded for a couple of 3g wireless modems, which have proven much quicker. We currently have 7, and will be getting more to equip schools which have sufficient facilities so they can access the Avatar Project Island.*

*I think one of the things that perhaps needed a change in mindset was just how close to the cutting edge we are, and how much that is going to cost us in terms of the technology. Initially we were looking at venues which could handle Second Life, even Internet Cafes, I think all of us thought we could find a solution, but in the end we just had to do it all ourselves.*

A related access issue is sustainability: what happens when the people with the laptops leave? With this in

mind, once our 'laptop and wireless solution' was in place, we set about to find ways to overcome the hurdles. Initially we were able to identify a lab that could be upgraded to run virtual worlds once we installed new graphics cards. In regard to internet connectivity, we paid to have a cable connection installed at the school whilst simultaneously lobbying the Department of Education's network providers to unblock the relevant Internet ports. Ultimately the latter approach proved successful; we used the cable connection for some weeks before being able to switch back to the school's (now unblocked) connection. A lesson from Avatar and subsequent projects is that interpretations of school network security protocols can be arbitrary, depending on the people in charge of maintaining web access, and some persuasion at their levels (and above) can prove fruitful.

### THE QUESTION OF ACCESS

When we analyse our Avatar Project work, both our experience and our data supports the argument for the continued existence of the "digital divide" (Livingstone, S. and Helsper, E. 2007; Chinn, M. & Fairlie, R. 2006; OECD, 2001). During the life of the project, most Cityscape High students had limited and unsatisfactory access to computers and the internet outside of class. This appeared to impact on the level of student engagement with the virtual world, and is consistent with research showing that the digital divide is still in existence, albeit more in the quality of access to technology rather than the presence or absence of this access. (Blanchard et al, 2007)

Further, when Cityscape High students did have access to the virtual world during class, they generally did not investigate its possibilities to its full potential, although initial levels of enthusiasm were high. Underpinning our work with these students was a sobering realisation – that, due to their level of socio-economic disadvantage, these students did not have the hardware at home, nor the bandwidth, to revisit the technology in their own time and fully explore its potential. This was in stark contrast to the students at an elite Anglican private school with whom we also worked. Many of these latter students were logging into the virtual world at home and after hours, and some became quickly adept at using the technology.

It is our contention that seeing the Cityscape High students as 'disengaged' is a form of what Valencia (Valencia 1997) describes as 'deficit' thinking, in that they are seen by authorities as lacking the proper orientation to schooling. The question of whether or not the school was or could be properly oriented to meet the interests and needs of these young people is not considered. What we can say is that, from what these young people told us, they were certainly interested in this new technology, at least initially. However when the demands of the traditional curriculum were incorporated into the virtual world, an underlying sense of 'nonengagement' (Macey and Schneider 2008) quickly surfaced; 'nonengagement' referring to an ongoing and self-perpetuating state of exclusion from participation. These young students weren't 'disengaged' because it seems they had never been engaged in the first place. Could the use of technology such as virtual worlds

change this? The indications from our work were encouraging, particularly the high level of involvement by a number of students labelled as problematic. These students were enthusiastic participants in our lunchtime and after-school sessions, which were generally filled to capacity. However, we hypothesise that these students' overall lack of consistent access undermined their enthusiasm and contributed to the complexity of the project and its outcomes. Whilst many students enjoyed the experience of exploring virtual worlds through structured and unstructured activities, issues of access and engagement loomed large and were inescapable.

### CONCLUSIONS

The Avatar Project ended up running satisfactorily but not perfectly. It met its aims of embedding virtual world activities in the school, but these activities ran for less time that we would have liked (roughly 18 months), due to the range of issues we encountered in getting the technology in place and working. However, this process itself – details of which were documented by the research team through observations, field notes, reflective blogs and emails - has provided valuable insights into some of the broader issues connected with the operational side of running technology-based research projects. These issues, we believe, are not discussed as readily as they should be, hence this paper.

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