VU @ SECOND LIFE*– CREATING A (VIRTUAL) COMMUNITY OF LEARNERS

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ABSTRACT

In this paper we report on our experiences in creating presence for our university in the Second Life environment. After a brief explanation of our motivation(s), we will describe our approach, which resulted in creating a virtual campus acting both as a portal for information, and, more importantly, as a meeting point, offering the opportunity to create a virtual community of learners, in line with the overall educational policy of our university. We will discuss the merits of Second Life as an educational platform, and indicate relevant research perspectives. To illustrate how the virtual meets the real, an impression will be given of our encounters with the press.

INTRODUCTION

Online virtual worlds have been present for more than 10 years, AlphaWorld[1], for example, was introduced in 1995. However, the recent substantial media attentention for Second Life can be considered as an indication that virtual worlds are no longer the domain of a selective group of fanatic online gamers. For example, the number of registered residents in Second Life increased from 1,8 million at the beginning of December 2006 to over 4 million within a period of less than 3 months. Big companies like Reebok, IBM, Philips, and ABN AMRO organize press meetings to announce their presence in virtual worlds. Even governments, municipalities, and NGOs enter Second Life with an eagerness that is comparable to the *don't miss the boat* feeling recognized at the early days of the internet. Second Life has even been presented as hype. On February 28th 2007, the Vrije Universiteit Amsterdam (in English, our official name is *VU University Amsterdam*) announced its presence in Second Life as the first Dutch university. National and international companies are eager to have their regional headquarters in Amsterdam. The international reputation of Amsterdam with respect to its tolerance for sex and soft drugs has apparently been no hindrance to that. However, when we announced our presence in Second Life as the first Dutch university, news items appeared, in Elsevier[2] among others, which mentioned the senate's (Tweede Kamer) concern with possible irregularities in Second Life immediately after announcing our university's presence in Second Life.

Why does a respectable university, like ours, want to be present in Second Life? And what are the prospects or benefits for an educational institute with a strong research reputation to be present in Second Life? Is it publicity we are after, the momentary attention of the press, taking profit of the (current) hype around Second Life, or are there more sustainable reasons that make such presence worthwhile, from both educational and research perspectives. In the following, we will address these questions, and give an account of the process that led to our presence in Second Life.

The structure of this paper is as follows. First, we explain our motivation(s), and then we will outline the actual building of our virtual campus. We will discuss the potential of Second Life as an educational platform, and after that we will indicate relevant research perspectives. Then we will give a comparative technical overview, and ponder on why Second Life is so successful. Finally, after briefly reporting on our experiences when going live, and some speculative thoughts about future developments, we will present our conclusions.

CREATING PRESENCE IN A PARTICIPATORY CULTURE

In less than a decade after the publication of William Gibson's novel *Neuromancer*, the *metaverse* was realized, albeit in a primitive way, through the introduction of VRML[3], introduced at the Int. Web Conference of 1992. Cf. Anders (1999). The German company *blaxxun*[4], named after the virtual environment in Neil Stephenson's *Snowcrash*, was one of the first to offer

*www.vu.nl/secondlife

[1] www.activeworlds.com/worlds/alphaworld

[2] www.elsevier.nl/nieuws/laatste_24_uur/artikel/asp/artnr/140574

[3] www.web3d.org

[4] www.blaxxun.com

a 3D community platform, soon to be followed by *AlphaWorld*, already mentioned in the introduction, which offered a more rich repertoire of avatar gestures as well as limited in-game building facilities. However, somehow 3D virtual communities never seemed to realize their initial promises. Furthermore the adoption of VRML as a 3D interface to the Web never really took off.

The history of Second Life is extensively descibed in the official Second Life guide, Rymaszweski et al. (2007). Beginning 2004, almost out of the blue, *Second Life*[5] appeared with a high adoption and low churn rate, now counting, March 2007, over 4 million inhabitants. Considering the cost of ownership of land, which easily amounts to 200 euro per month rent after an initial investment of 1500 euro for a single piece of land measuring 65,536 square meters, the adoption of Second Life by individuals as well as companies such as ABN-AMRO, Philips and institutions such as Harvard is surprising.

What is the secret of the success of Second Life? We don't know! But in comparison to other platforms for immersive worlds, including MMORPGs such as *World of Warcraft*[6] and *Everquest*[7], Second Life seems to offer an optimal combination of avatar modification options, gesture animations, in-game construction tools, and facilities for communication and social networking, such as chatting and instant messaging. Cf. Utz (2003). Incorporating elements of community formation, commonly denoted as Web 2.0, and exemplified in MySpace, YouTube and Flickr, the immersive appearance, perhaps also the built-in physics and the inclusion of elementary economic principles, seem to be the prime distinguishing factors responsible for the success of Second Life. In addition, the possibility of recording collaborative enacted stories, Davenport (2000), using built-in *machinima*[8] certainly also contributes to its appeal. Later on, after discussing Second Life from a more technical perspective, we will speculate further on the possible reasons for the success and adoption of Second Life as a platform for communication and immersive presence.

What has been characterized as a shift of culture, from a media consumer culture to a participatory culture, Jenkins (2006), where users also actively contribute content, is for our institution one of the decisive reasons to create a presence in Second Life, to build a virtual platform that may embody our so-called *community of learners*, where both staff and students cooperate in contributing content, content related to our sciences, that is.

[5] secondlife.com
[6] www.worldofwarcraft.com
[7] everquest.station.sony.com
[8] www.machinima.org

BUILDING A VIRTUAL CAMPUS

In December 2006, we discussed the idea of creating presence in Second Life. Our initial targets were to build a first prototype, to explore content creation in Second Life, to create tutorials for further content creation, and to analyze technical requirements and opportunities for deployment in education and research.

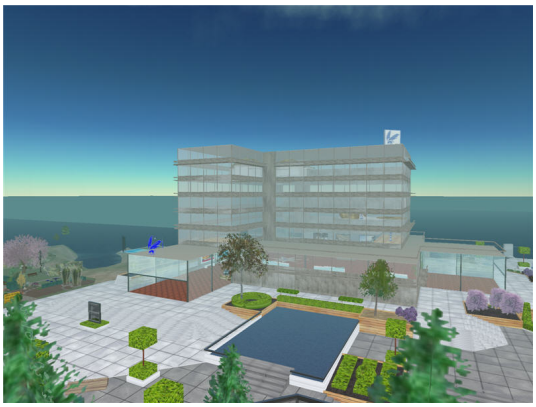

Fig 1. VU Campus – outside view

Two and a half months later, we are online, with a virtual campus, that contains a lecture room, a telehub from which teleports are possible to other places in the building, billboards containing snapshots of our university's website from which the visitors can access the actual website, as well as a botanical garden mimicking the VU Hortus, and even a white-walled experimentation room suggesting a 'real' scientific laboratory. All building and scripting were done by a group of four students, from all faculties involved, with a weekly walkthrough in our 'builders-meeting' to re-assess our goals and solve technical and design issues.

Fig 2. VU Campus – inside view

The overall style is realistic, although not in all detail. Most important was to create a visual impression of resemblance and to offer the opportunity to present relevant infomation in easily accessible, yet immersive, ways. Cf. Bolter & Grusin (2000), Hoorn et al. (2003).

Our virtual campus, see figs. 1 and 2, is meant to serve as an *information portal* and as a *meeting ground*, where students, staff and visitors can meet and communicate, as well as a place were teachers and researchers can conduct experiments aimed at discovering new ways of teaching and doing research.

SECOND LIFE AS AN EDUCATIONAL PLATFORM

The first idea that comes to mind, naturally, is to use Second Life to offer courses online. But, although we do have plans to give lectures (college) on law, probably including the enactment of a particular case, we do consider this approach as rather naive, and frankly we see no reason to include what may be considered an outdated paradigm of learning in our virtual campus, where there might be more appealing alternatives. Similarly, using the virtual laboratory for experiments might not be the best way to offer courses, although, again, we do intend to provide a model of a living cell, allowing students to study the structure, functionality and behavior of organic cells in virtual space.

Considering the success of our multi-disciplinary building team, it seems more worthwhile to take the cooperative effort of building as a model, and switch to a paradigm of learning in which in-game exploration and building plays an important role. It is no secret that many students enjoy gaming, and although some might think that *gaming is a waste of time*, many authors, including Gee (2003) and Vorderer & Bryant (2006), seem to think that gaming and game-related efforts provide a form of *active learning*, allowing the gamer to experience the world(s) in a new way, to form new affiliations, and to prepare for future learning in similar or even new domains.

More importantly, due to intense involvement and the need to analyze game challenges, according to Gee (2003), gaming even encourages *critical learning*, that is to think about the domain in a meta-level as a complex system of inter-related parts, and the conventions that govern a particular domain, which Gee (2003) characterizes as *situated cognition in a semiotic domain*. Without further explanation, we may note here that *semiotic domain* means a *world of meaning* that is due to social conventions and patterns of communication. Cf. Kress & Van Leeuwen (1996).

Observing that both creativity and communication are vital elements of higher education, we envisage to deploy Second Life for a multi-disciplinary honors-track course that will focus on the communication of scientific research, for example the impact of climate change and the various ways we can mitigate or adapt to the potential threats of global warming. In this way we can also contribute to the issue of *media literacy*, or "*mediawijsheid*[9]" as the Dutch Council of Culture calls it, that is making students aware of the impact of the media in presenting controversial issues. In this respect we strongly believe that Second Life does not necessarily lead to another screen-addiction giving access to dubious content, but that it can actually be deployed in a constructive way as an opportunity to stimulate and support active learning.

RESEARCH PERSPECTIVES – VIRTUAL VERSUS REAL

Is decision-making in a virtual environment the same as or similar to decision-making in the real world? And what about investments, and starting a new company? The Second Life economy, powered by Linden dollars and governed by the Lindex-exchange, provides an interesting platform to study decision-making behaviors, for example with a group of students in a course about decision-support systems.

Another way to establish a relation with reality is to provide a *virtual context* to objects existing in actual reality, such as cultural heritage, and for example relate paintings to the world they depict, which must necessarily be re-constructed in a virtual environment as it no longer exists, Rutledge et al. (2000).

In previous work, we did study the construction and deployment of humanoid intelligent agents, Eliens et al (2006), and we looked at ways such agents could provide an explanation in rich media contexts, Eliens et al. (2003), or guidance in finding locations in large virtual worlds, Ballegooij & Eliens (2001). Also did we explore whether virtual replicas of existing buildings, in our case museums, was the best way to provide immersive access to art-related information, Eliens et al. (2007), and actually we concluded that it was not! In one of such virtual replicas, in this case the atelier of the Dutch artist Marinus Boezem, we studied the effectiveness of the use of an intelligent humanoid agent, and we found interesting relationships between the appearance (looks) of the agent, and the trustworthiness of its advice, Hoorn et al. (2004), Van Vugt et al. (2006a). We extended our research efforts into appearances of virtual humans and their effectiveness in virtual worlds like the Sims, Van Vugt et al. (2006b). Furthermore, we studied differences between perceptions of fictitious (i.e. Hollywood) characters versus existing (i.e. real world) characters, Konijn & Bushman (2007). Finally, we examined the role of emotions in establishing effective communication between real and virtual humans, Konijn & Van Vugt (2007).

However, apart from studying patterns of communication, and the way appearance and identity may influence communication (e.g. Konijn & Nije Bijvank (2007)), it

[9] www.cultuur.nl/nieuws.html?nieuws_speeches.php?id=184

seems at this stage more interesting to explore how to enhance communication in a shared virtual world by actually deploying virtual objects, instead of relying on chatting and textual information, and to design tasks that require cooperation in an essential manner. More generally, we would like to deploy Second Life as a platform for *serious games*[10], such as service management games, Eliens & Chang (2007), and we believe that for corporate institutions this might well be the real benefit Second Life has to offer!

Taking, however, a more critical look at Second Life as a platform for serious games, it might appear to be lacking in a number of respects, including (not the least important) security, programmability and robustness. As the failure of many of the early CSCW (Computer Supported Cooperative Work) applications indicates, cf. Churchill et al. (2001), to provide adequate support for collaboration is not easy, since a manifold of issues have to be resolved, such as turn-taking, gaze detection, etcetera. And in addition, for tasks that require strict timing, such as musical improvisation, Eliens *et al.* (1997), synchronization and time-lag have to be taken into account.

Taking these issues into account, we may wonder whether we should adopt Second Life, or rather seek refuge with an open source game engine such as Delta3D[11], or a commercial game engine such as offered by the Steam-powered Half Life 2 SDK[12], cf. Eliens & Bhikharie (2006), which might be more compliant with the extensions required to provide adequate support for serious cooperative games. Interestingly, the Second Life client has recently been given out to open source, and that would allow for many client-side hacks, such as for example multi-modal interaction[13], which in combination with the server-side scripting capabilities may result in powerful extensions.

At this stage, though, it might well be the level of adoption that is decisive in the choice of Second Life as a platform for serious corporate games!

COMPARATIVE TECHNICAL OVERVIEW

From a technical perspective, Second Life offers an advanced game engine that visitors and builders use (implicitly) in their activities. Before discussing how Second Life compares to (a selection of) other game engines and virtual environment frameworks, it is worthwhile to look at an overview of the main functional components of a *game engine*, which according to Sherrod (2006) encompass:

- rendering system – 2D/3D graphics
- input system – user interaction
- sound system – ambient and re-active
- physics system – for the blockbusters
- animation system – motion of objects and characters
- artificial intelligence system – for real challenge(s)

Although it is possible to build one's own game engine using OpenGL or DirectX, or the XNA[14] framework built on top of (managed) DirectX, in most cases it is more profitable to use an existing game engine or 3D environment framework, since it provides the developer with a load of already built-in functionality. In the following table, we give a brief comparative technical overview of, respectively, the Blaxxun Community Server (BlC), AlphaWorld (AW), the open source Delta3D engine (Δ3D), the Half Life 2 Source SDK (HL2), and Second Life (SL).

	BlC	AW	Δ3D	HL2	SL
in-game building	-	+	+/-	-	++
avatar manipulation	+	++	+/-	+	++
artifical intelligence	+	-	+/-	+	-
server-side scripts	+	-	+/-	+	++
client-side scripts	++	-	+/-	+	-
extensibility	+	-	++	+	+/-
open source	-	-	++	-	+/-
open standards	-	-	+/-	-	+/-
interaction	+/-	+/-	++	++	+/-
graphics quality	+/-	+/-	++	++	+
built-in physics	-	-	+	++	+
object collision	-	-	++	++	+
content tool support	+/-	-	++	+	-

Obviously, open source engines allow for optimal extensibility, and in this respect the open source version of the SL client may offer many opportunities. Strong points of SL appear to be *in-game building*, *avatar manipulation*, and in comparison with BlC and AW *built-in physics* and *object collision detection*. Weak points appear to be *content development tool support*, and especially in comparison with Δ3D and HL2 *interaction*. For most types of action-game like interaction SL is simply too slow. This even holds for script-driven animations, as we will discuss in the next section. In comparison with a game as for example Age of Empires III[15], which offers in-game building and collaboration, Second Life distinguishes itself by providing a 3D immersive physics-driven environment, like the 'real' game engines.

SCRIPTING IN SECOND LIFE

Second Life offers an advanced scripting language with a C-like syntax and an extensive library of built-in functionality. Although is has support for objects, LSL

[10] games.uscannenberg.org/AWGHome.php
[11] www.delta3d.org
[12] half-life2.com
[13] www.hackdiary.com/archives/000101.html
[14] crosoft.com/directx/XNA
[15] www.ageofempires3.com

(the Linden Scripting Language) is not object-oriented. Cf. Eliens (2000). Scripts in Second Life are server-based, that is all scripts are executed at the server, to allow sharing between visitors. Characteristic for LSL are the notions of *state* and *eventhandler*, which react to events in the environments. As an example of perhaps the most simple script to be found, taken from the online tutorial of CTER[16], look at:

```
default {
  state_entry() {
  llSetText("Do you want to learn scripts?",
          <255,255,255>,5);
  }
}
```

When attached to an object, triggering *state_entry* (in the *default* state), results in displaying the text *"Do you want to learn scripts?"*.
LSL offers a range of built-in types, including *int*, *float*, *list*, and even *vector* and *rotation* (which is a 4-place vector). It provides the standard operators, as well as the usual blocks and scopes. Scripts are attached to objects and must be explicitly activated, for example by right clicking on the object and selecting, for example, the option *teleport*, as in the script below, which may be used for teleporting visitors' avatars:

```
vector target= <162,134,27>; // coordinates
default {
state_entry() {
   llSetText("Info @ VU",<255,255,255>,5);
   llSetSitText("teleport");
   rotation my_rot=llGetRot();
   llSitTarget((target - llGetPos()) /
       my_rot,ZERO_ROTATION / my_rot);
   }

changed(integer change) {
   llUnSit(llAvatarOnSitTarget());
   }
} // end default
```

Selecting the *teleport* option actually results in creating an invisible object on which the avatar *sits*. The object is then transported to the *target* location in about 0.2 seconds. The 0.2 second interval does also apply for other actions, for example rotations to objects, which gives an awkward visual impression, simply because it is too slow. For teleports, however, the 0.2 second interval does suffice.
Among the built-in functions there are functions to connect to a (web) server, and obtain a response, in particular (with reference to their wiki page):

- request – wiki.secondlife.com/wiki/LlHTTPRequest
- escape – wiki.secondlife.com/wiki/LlEscapeURL
- response – wiki.secondlife.com/wiki/Http_response

Other functions to connect to the world include *sensors*, for example to detect the presence of (visitors') avatars, and chat and instant messaging functions to communicate with other avatars using scripts. In addition, LSL offers functions to control the behavior and appearance of objects, including functions to make objects react to physical laws, to apply force to objects, to activate objects attached to an avatar (for example phantom Mario sprites, see section *hold your breath*), and functions to animate textures, that can be used to present slide shows in Second Life.

ADMINISTRATION AND SUPPORT

When building our virtual campus we did experience in practice how difficult it is to manage properties like ownership, access and modifiability rights, and when going live these issues became even more urgent, since malicious visitors may profit from any administrative negligence.
As a reference, we list some of the resources available for developers, which are organized as wiki's, and at the moment of writing still in flux, that is incomplete, but growing:

wiki(s)

- knowledgebase – secondlife.com/knowledgebase
- scripting – wiki.secondlife.com/wiki/LSL_Portal
- main page – https://wiki.secondlife.com/wiki

All in all, administration in Second Life is intricate and in our experience not entirely bug-free. So far we have not understood all the ins and outs of property management and security in Second Life.
Additionally, there are resources that may give developers an idea[17] which direction to take, educators hints[18] on how to set up a course, and more general resources providing building tutorials[19] and an insight[20] in the history of Second Life, explaining among others the growth of the Second Life virtual economy.
A convenient, and to make your world accessible perhaps essential feature is the so-called *slurl*, that allows for access to your Second Life property from a web page. As an example, the *slurl* connecting to the *VU University NL* virtual campus is:

slurl.com/secondlife/VU%20University%20NL/29/151

[16] cterport.ed.uiuc.edu/technologies_folder/SL

[17] www.secondlifeinsider.com
[18] www.simteach.com/wiki
[19] trumpy.cs.elon.edu/metaverse/wiki
[20] www.slhistory.org/index.php/Main_Page

SECOND LIFE SUCCESS FACTORS

Will Second Life become the new (immersive 3D) mass medium of our participatory culture of the 21th century, as once the immersive *panorama* was the propaganda/art medium for the masses in the 19th century? Cf. Grau (2003). In thinking about possible reasons why Second Life is so successful, we observed that Second Life does provide:

- convergence of social networking and content creation
- immersive networked 3D environment
- inclusion of elementary economic principles

However, we also see that other factors may contribute to the success of Second Life, such as:

- don't miss the boat effect
- free and easy accessible 3D design tool set
- adoption by big companies like IBM, Reebok, ...
- marketing of Second Life by Linden Lab (?)
- the promise to make (real) money (?)

According to Philip Rosedale, CEO of Linden Lab, (interview in .NET magazine, issue 158, January 2007) the success of SL is due to the fact that (1) it offers a set of capabilities, which are in many different ways superior to the real world, (2) the decision to allow residents to own the intellectual property rights to their creations and (3) because Second Life is full of creative possibilities, and opportunites for innovation.
In order to establish what constitutes the success of Second Life in a more rigorous manner, we must subject Second Life to a (game) *reference model* as introduced in Juul (2005), which we have also applied to (serious) service management games in Eliens & Chang (2007). A first tentative characterization of Second Life according to our reference model would be:

reference model

- *rules* – construct and communicate!
- *outcome* – a second world
- *value* – virtual and real (monetary) rewards
- *effort* – requires elementary skills
- *attachment* – a virtual identity
- *consequences* – transfer to first life

Second Life clearly has a wider scope and more freedom than just gaming. Apart from elementary rules, that more or less require of the (serious) visitor to *construct and communicate*, there are almost no fixed rules, no in-game strategies, but many opportunities for interpersonal contact and the establishment of relations world-wide, affecting (possibly) the Second Lifer's first life (*consequences*).
Whether Second Life will turn out to be a veritable media-supported augmentation of our first life, cf. Zielinski (2006), remains to be seen. Chances are also that Second Life will end up as another item on the *dead media projects*[21] list, to be replaced by an alternative participatory framework or environment.

Fig 3. VU @ SL – visitors outside

HOLD YOUR BREATH – GOING LIVE

The 1st of March 2007, we went live. In the evening there was a news item on national televison, RTL4 news, featuring the students showing the virtual campus and our project leader explaining the reasoning behind our presence in Second Life and how to give a course in the virtual classroom. A similar item appeared at AT5, local Amsterdam television, and various newspapers, among which Parool, Telegraaf and Volkskrant, spent a multiple-column article to report on our efforts. As a note, not surprisingly, all items focused on what we have characterized as the naive interpretation of our efforts, exemplifying the old credo *the medium is the message*. To be clear, our intention is not to provide a virtual replica, nor to provide an analogon of the Open University, in Second Life.

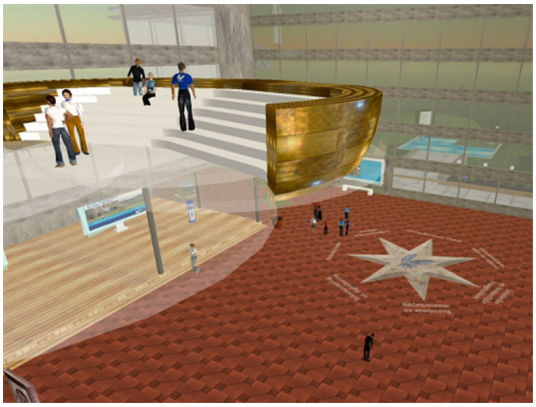
Fig 4. VU @ SL – visitors inside

After the news broadcasts, the number of visitors increased dramatically, having stayed at a modest below

[21] www.cs.vu.nl/∼eliens/media/project-deadmedia.html

100 during the day, see figs. 3 and 4. In the evening, however, just after the news items on the national television, the number of visitors increased rapidly. Since, presently, we do have only one island it appeared to be very difficult to separate internal experimental activities from visitors just asking for additional information, and to exclude potentially malicious visitors. In that evening, we were even surprised by the invasion of an army of Mario Brothers. Hilarious and non-harmful. But enough reason to sit back and limit access to our campus for students and staff only the day after our open day. A few days later, after the first turbulent days following the TV broadcasts, we re-opened our virtual campus to allow visitors to walk/fly around, and enjoy our news items and informative videos. So far, the results exceeded our expectations, the students were praised for the results of their building efforts, and as a team we may continue to think about how to deploy Second Life as a platform for education and research projects.

FUTURE DEVELOPMENT(S)

Virtual or not, ecomomy plays a crucial role in the (past and) future of Second Life, since (www.openthefuture.com):

> ... the internal economy was predicated on the notion that designers could produce in-game objects that they could then sell.

However, the ability to copy mechanically might easily destroy such an economy. In general, it might be questioned whether the (real) economic model of Second Life will hold, or whether an alternative approach which is free from immediate economic constraints, similar to *open source*, will prevail.
In our own educational and research projects we will strive for making Second Life available as a platform for *mediating social awareness*, cf. Vyas et al. (2007) and Vyas et al. (2007b), and actual collaboration, in particular in our university-wide media institute *CAMeRA*, that will coordinate among others our activities in serious game development. Looking what is going on in Second Life, on a global scale, we refer without further comments to the following resources:

- NOAA: 3D weather data visualization[22]
- NOOA: test the water in a virtual world[23]
- CDC: spare change in secondlife[24]
- APPLE: be anyone, set your own agenda[25]
- MMORPG: secondlife as a game[26]

[22] www.secondlifeinsider.com/2006/10/28/3d-weather-data-visualization-in-second-life
[23] www.gcn.com/print/26_04/43147-1.html
[24] www.social-marketing.com/blog/2006/11/cdcs-second-life.html
[25] www.apple.com/games/articles/2005/07/secondlife/
[26] www.mmorpg.com/gamelist.cfm?gameID=83&bhcp=1

CONCLUSIONS

In this paper we have reported on our experiences in building a virtual campus, giving our university presence in Second Life, and we have delineated the prospects of Second Life as a platform for education and research, embodying our university's credo: to be a *community of learners*. After enjoying our *15 minutes of fame*, however, we need to reflect on what technical requirements must be met to deploy Second Life effectively as a platform for education and research, and, perhaps more importantly, what paradigm of learning to adopt to have real benefit of the potential of Second Life.

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