

LEARNING TO TEACH IN *SECOND LIFE*

Angelina Macedo
EB 23 Gualdim Pais, Portugal
angelina.m.macedo@gmail.com

Lina Morgado
Universidade Aberta, Portugal
lmorgado@univ-ab.pt

Keywords: Second Life, immersive learning, lifelong learning, Web 2.0 tools

Abstract: The rapid evolution of ICTs in the 21st century requires highly competent and skilled workers. Distance education appears to be not only a possible but a highly viable solution to increase the competencies of those already professionally active. Virtual environments such as Moodle and Second Life with Web 2.0 tools now allow for socialisation and social presence in the process of distant learning thus facilitating cooperation, interaction and more interest on the part of the students. These new learning environments also make it possible to learn by doing as people learn how to use them as they are participating in the distance learning courses. The European Union, aware of the advantages of these pedagogical approaches, is funding projects for lifelong learning such as the MUVEnation programme. Several studies and current research lead us to conclude that these tools and Second Life, in particular, have great potential for teaching and learning as they enhance the development of socialization skills, peer and group work, critical thinking and problem solving. At the same time it is recognised that further research is required in order to overcome certain drawbacks.

1. INTRODUCTION

The constant evolution of ICTs and the demands of the 21st century made learning crucial to our knowledge and networked society. Therefore, companies and the industry are interested in skilled and competent workers as a way of enhancing their outcomes.

Lifelong learning, with continuing professional training and development, is a must in our society. As workers are very busy with both their professional and personal lives, taking a face-to-face course is almost impossible. Therefore distance education is an emergent solution with the advances in ICTs.

Virtual environments such as Moodle and Second Life can promote interaction, cooperation and collaboration between students and e-teachers as well as between peers.

One of the drawbacks of traditional distance education has been the fact that students tend to feel

lonely, isolated leading to very high drop rates. These virtual environments allow new pedagogical approaches that enhance collaboration, as well as both asynchronous and synchronous interactions between participants.

The MUVEnation programme, funded by the European Commission under the Lifelong Learning Programme aims to encourage teachers to develop new pedagogical methods to increase students' motivation. It encourages the use of Web 2.0 tools such as blogs for personal reflection, wikis for collaborative work, Flickr to share photos, Twitter for microblogging, etc. Moodle is used as the learning management system and Second Life is being explored for educational applications.

2. SECOND LIFE

Second life is a Multi-User Virtual Environment (MUVE) that allows students and teachers to collaborate actively in projects, and to exchange ideas and information in-world.

Second Life (SL) is a world that tries to reproduce the real one, including the development of rules and even its own economy. People are represented by their avatars (their 3D representations) and they communicate through chat (voice or written text), notecards, their profiles or Instant Messages (IM). The latter are delivered if the resident is not online at the moment s/he logs in.



Figure 1 – Avatar’s profile: Morgen String (author proposal)

Second life also provides educational resources, links, a wiki and a blog for educators. Linden Research (2006) [8] made an agreement with ISTE, for example, to help new people in-world and it also supports teaching in SL (Terdiman, 2004) [9]. Livingstone & Kemp (2006) [10] also studied and gathered the main features that make SL a good tool for education.

This virtual world has the potential to develop a simulation of ‘real life’ skills and competencies or to create new worlds (De Lucia et al, 2009) [1] rather than ‘academic life’, that is, it can enhance an experiential learning through activities such as simulations and role-plays.

It also promotes immersive learning as the learner can potentially experience the emotions and thoughts of someone in a simulated situation.

It is also possible to implement learning models that enhance the cognitive structures of the learner (Piaget, 2001) [2], where students can engage in an active learning process which is student-centred (Bruner, 1960) [3] and guided by an expert or faculty mentor/tutor who interacts with the students (Vygotsky, in Galloway, 2001) [4]. This kind of learning allows an active development of competencies based on evidence as students actively construct new knowledge as they interact with other people and their environment (Jonassen, 1992) [5]. Students are supposed to produce collaboratively tangible outcomes or products (Brown, Collins & Duguid, 1989) [6] such as a building plan, a car prototype, etc, according to the nature of the

knowledge that is being built. It also potentiates the creation of communities of practice where people learn by sharing. These communities can be described as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. (Wenger, 2000) [7]. The Iowa State University has already created the NMC Educational Community and below is their virtual representation of Wenger’s Communities of Practice. (SL Island: Teaching 4 231, 155, 25).



Figure 2 – NMC Educational Community (author proposal)

Because of the great potential SL has already shown, several companies and educational institutions have established their own lands/islands in this virtual world.

2.1. Second Life for educational purposes

2.1.1. Training and Skills Development

Second Life enhances the development of skills and competencies in all the fields as is shown below.

The Thomson Netg develops professional training in ICTs, management, sales and customer support. It uses SL for synchronous classes and on-demand training through audio, video or podcasts resources. Their students can interact with technological applications and do role-play activities.



Figure 3 - Thomson Netg Training (Source: FitzGerald, & Kay) [11]

As far as the Health field is concerned, SL allows the immersion in an authentic context that enhances a deeper knowledge of situations or circumstances. For instance, the *Heart Murmur Sim* aims to provide a place for cardiac training where the participants can visit virtual patients, listen to their cardiac rhythms and make a diagnosis.

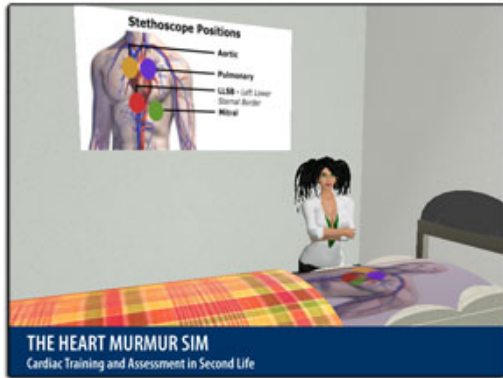


Figure 4 – Cardiac Training (Source: FitzGerald, & Kay) [11]

UC Davis Medical Center’s Emergency Workers aims to prepare, train and help its workers to act in emergency situations, in a simulated context before acting in a real world crisis.

Another important work is being done by the *National Oceanographic and Atmospheric Administration*. It has created the visualization in real time of some weather phenomena such as a tsunami or the effects of melting glaciers on the ocean level.

The goals of this island are to stimulate scientific discussion and reflection upon climate issues and, at the same time, allow participants to engage in simulations that wouldn’t be possible in the real world.

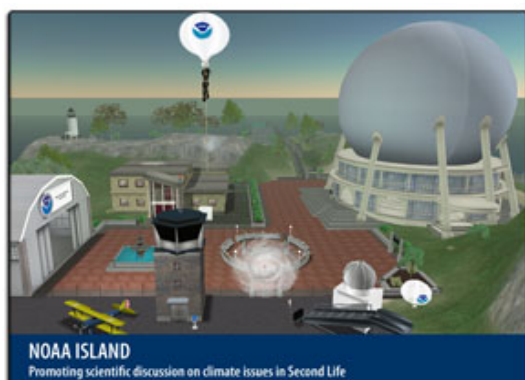


Figure 5 - National Oceanographic and Atmospheric Administration (NOAA) island in SL (Source: FitzGerald, & Kay) [11]

2.1.2. Training in-service and future professionals

Second Life enhances social interaction, collaboration, the awareness of social global issues, events, data visualization, simple simulations and education.

It allows for the development of a new model for distance education as well as blended learning, and new opportunities for virtual learning. Students and tutors can meet in-world, share information and resources (audio and video files, for instance), discuss projects, make presentations, and do group projects. They can also interact with other educational institutions and develop international projects. This virtual world eases communication and sharing, key elements in the learning process. Students can make simulations where they can learn from their mistakes and develop new skills to apply in their real lives.

Several educational institutions like the Harvard University, the Leicester University, the Universidade de Aveiro, Porto, and the Open University (UK), among others, have their own educational spaces in SL where they deliver some courses in several fields.

The Open University of Portugal has implemented a case study to obtain information about students’ perceptions of social presence both in Moodle and in SL in order to design and deliver teaching and learning activities in both virtual environments.

The NMC (New Media Consortium) Campus is the most important educational institution in SL. It supports events, classes, demonstrations, art exhibits and educational experiences.

Several well-known educators such as Howard Rheingold, Henry Jenkins and Daniel Reed, have been in conferences at this campus.

The Harvard’s Berkman Center for Internet and Society delivers a course to create and present Internet and Web 2.0 tools such as Wikis e blogs. The students also meet in-world at Berkman Island.

The Texas Wesleyan University has got the Genome Island in SL, which was developed by Professor Mary Anne Clark with the aim of teaching Genetics.

With the help of building tools and scripting, she built laboratories where the students can participate in virtual experiences and produce data for analysis.

The students can also interact with experts in Genetics to broaden their knowledge.



Figure 6 –Texas Wesleyan University Genome Island
(Source: FitzGerald, & Kay) [11]

Besides the above institutions, BBC realized the SL potential to teach foreign languages, mainly English, having created its own space at Virtlantis 116.114.21 (PG). This institution blends SL with Internet pages, supporting the learning of several issues. Virtlantis island is formed by foreign language educators and is an example of best educational practices in SL.

Also another excellent work is being developed by Jo Kay and Sean FitzGerald [11] about Second Life which can be found in their wiki Second Life in Education.

Facilitating informal learning is also one of the concerns in SL. Museums, libraries, Historical Recreations, Art and Music Literature, Machinima, Social issues debates, Politics, Civics, Economy, Commerce, Architecture, support for disabled people, virtual tourism, cultural immersion have a strong implementation in SL.

2.1.3. Pedagogical activities

According to Warburton & Perez-Garcia (2009, in Warburton, 2009) [12], Second Life has some components that can facilitate innovation in pedagogy through extended or rich interaction, visualization and contextualization, exposure to authentic content and culture, individual and collective identity play, immersion in a 3-D environment, simulation, community presence and content production.

SL allows the implementation of distance learning models where students can engage in an active learning process which is student-centred and guided by an expert or faculty mentor/tutor that interacts with the students (Pereira et al., 2008) [13], (Morgado et al., 2008) [14].

SL ability to create a sense of belonging, a shared space, and the sharing of experiences makes it ideal to develop pedagogical activities such as discussions, debates, presentations, simulations, role play,

conferences, exhibits, Treasure Hunts and virtual quests. This way SL provides a wide range of possibilities that wouldn't be possible in the real world.

In-world you can perform a Shakespeare play for a vast audience, visit a virtual museum, plan your own house and visit it, check the space, the furniture, make adjustments... You can also visit Ancient Rome, prepare a Treasure Hunt where your students can find relevant information. You can also visit the Sistine Chapel, enter a Van Gogh painting or simulate flights at NASA.

Real time conferences, with people – avatars from all over the world, in the same virtual room, at the same time, allow debating important topics. Fashion students can organize a fashion show. The Management students can create a company and check the way it works with taking real risks with real money. The presentations through white boards may be kept in the participants inventory and retrieved later on.

In conclusion, SL has a great potential for distance education, supports computer mediated cooperative and collaborative work, simulations and formal/informal learning and training. It allows each individual to develop skills and competencies, to try new ideas and to learn from the mistakes they make. It also enriches the curriculum and complements face-to-face education.

2.1.4. MUVEnation in SL

Currently learners are used to technology so it's important to integrate them in the classroom through meaningful activities that engage the students.

According to Oblinger (2003, in Martinez, 2007) [15] Student today expect technology to be a natural part of any learning environment because, it has been an integrated part of their lives. They expect technology to be a natural part of any learning environment. Students think in terms of the activity technology enables and prefer construct their own learning, assembling information, tools and frameworks from a variety of sources. (Educause, 2005) [15].

Therefore, I began planning a teaching module in Second Life and felt the need to be a learner first. So I joined the postgraduate course "Teaching and Learning with MUVes" inserted in the MUVEnation project.

This programme aims at developing a European peer learning program. But the fact is, people from all over the world are participating in this project, which has been very enriching as we learn from one another's experience. "The MUVEnation project's general aim is to contribute to explore, analyse,

develop and evaluate within context the effectiveness of this innovative way of teaching and learning with regard to some of the problems of the educational system such as students' motivation and participation. MUVEnation is based on the so called "teachers' effect" on educational innovation and its approach is to explore the promising potential of active learning approaches integrated to MUVes by starting from the analysis of some major educational problems such as the lack of motivation and find how their integration in education can effectively foster pupils' motivation and participation."

The course was structured in Moodle where the learning activities were described. We could exchange information and clarify any question or doubt in the online discussion forums.

First, we were asked to get familiar with Web 2.0 tools and create our tools: blog, flickr, twitter, netvibes and we also set our presence at the wiki of the course. Then we created our accounts in Second Life, chose our avatars and did the orientation tasks. This task is one of the most challenging as it is the first time that we entered Second Life, completely on our own. We easily got disorientated, felt frustrated and were tempted to reject Second Life. A possible solution to overcome this situation is to set a time to meet in SL (tutors and peers) just after being on the orientation island. This way students could find someone familiar who would help to get them acquainted with the new world. Another solution is having an orientation island with the instructions in the students' mother tongue.

After the orientation tasks, we reflected upon several subjects related to education in Second Life. The activities that were the most difficult to carry out were group projects where members lived in different time zones. So we built our own groups, keeping in mind the real life place where people lived. These activities were quite rewarding and we have been able to build our own learning community in Second Life.

One of the activities was to observe some Hands-on Workshops and point out the best practices and what needed to be improved in order to develop a taxonomy of good practices.

A Hands-on Workshop is an instructional text based activity which is delivered to a small group, in a tutor-led teaching setting where the virtual learning space can be found configured in a variety of ways. (Warburton & Perez-Garcia, 2008) [16]. According to these authors [16] the workshops in Second Life usually aim to develop specific competencies and skills in building and/or scripting in-world objects. They are delivered in written chat and usually take an hour. These workshops are delivered by non-formal learning instructors and most of them are free.

After observing some workshops and discussing best practices, we observed and agreed on a taxonomy of good practices. A specific template was built in order to register our observation. It was validated by a new panel of teachers.

Then we prepared our own workshop for our peers. Among them, two were our critical friends. Their mission was to observe our practice and point out our best practices and suggest improvements.

Therefore, the methodology was participatory observation, followed by tutor's and critical friends' feedback.

The assessment of the workshop was related to the quality of the students' learning experience and outcomes.

I chose to present a workshop about basic building in Second Life: How to use the tube (a prim) to build a table and a stool.

In spite of preparing everything in advance, there are always some problems that we can't control like some technical issues that prevent us from doing everything as planned. For instance, just a bit before the workshop, I began having trouble with my Internet connection. I kept crashing and had to opt by a mobile Internet access which quality isn't the best. Also I wasn't able to rezz a tube because my upload bandwidth was with problems. Even my voice was heard with cuts, interruptions but the notecard reader solved this problem. I didn't use text chat because I wanted to be able to look at the participants and focus on their progresses and/or problems in order to help them out. At the end of the workshop, I helped some participants getting a notecard reader and explained to them how it worked so that they could use it during their workshops.

My aim was to design, deliver an interesting and useful workshop that enhanced the participants to understand how prims work and create nice objects, like a table and a stool, just with one prim each.

To perform the task, participants would manipulate a tube, by setting different parameters, in order to create a table and a stool. Finally, participants would texture them.

First, before the workshop, I prepared the virtual setting: individual, well limited working areas; stools with a script that allowed avatars to put their hands up when they had questions; examples of the objects that were going to be built – a table and a stool – notecards with all the instructions and a notecard reader. I asked a friend to test everything in advance to make sure that there were no problems.

Then, while delivering the workshop I began by explaining the task and giving the instructions both

through chat voice and a notecard that was being shown on the notecard reader. Also at the beginning of the workshop, a folder containing several textures and a poseball for the stool was given to each participant.

At the end of the workshop, the notecard was given to all the participants.

At the end of the workshop, all the participants managed to create a table and a stool. As some still struggled with the pose ball for the stool, we met in-world to solve this issue.



Figure 7- The workshop outcomes: tables and stools (author proposal)

In my opinion, several factors contributed to the positive outcomes:

- Previous preparation and checking (Special thanks to Jerit Weiser who tried the chairs to see if they were working properly, if the text displayed on the notecard reader was perceptible and gave his opinion on the setting).
- Using written text so that participants could visualize the instructions.
- Short and clear instructions.
- Managing the communication: hands up to ask questions.
- Few issues/topics in each session in order to avoid cognitive overload and finish the task in the specified time.

I learnt that we can overcome SL technical drawbacks. By collaborating with others we can have good results. Next time, I intend to try some collaborative work between the participants, may be pair work to start with.

One feature of MUVEnation course was the interaction between instructors and peers. It was quite motivating and helped us to get better learning outcomes. After the workshop, we were asked to describe the experience and reflect upon it. One of my tutors, Dr. Steven Warburton from King's College in London wrote *Great story - thanks*

Angelina. You've identified a number of useful practices that helped make the workshop a success. One of them is on managing the communication - but what do you mean by "hands up to ask questions" ... how did this work in practice?

When I reflected about the communication and how I managed it, I didn't quite explain how I achieved "hands up" through avatars, so here is my reply:

Hi Steve,

I attended a workshop where the instructor, Massimo, used chairs that had a script that allowed participants to put hands up if they had questions. I thought it was a good idea because when you are absorbed talking, giving instructions, it is more difficult to read all the messages in the local chat. So, if you look at participants and they have their hands up, it is easier to address each at a time and let them ask for clarification. That was what happened in my workshop and it was easier to help the participants. I must thank Cvetka who kindly gave me the chair.

My peer critics were very good and motivated me to try to accomplish even better results next time. As the workshop was delivered in Second Life, we used our SL identity, our avatars. Mine (Angelina Macedo) is Morgen String.

Observer 1 comments:

Morgen prepared a very nice setting for her workshop: our working area was delimited by a carpet and a cube, to sit on. In front of us a notecard reader board and an example of the table we were going to build.

I would like to comment briefly on the setting because, although at first sight it could seem as "standard" (rows of people facing a board), it was somehow innovative and clever. Let's see how and why.

Firstly, our seats had a double function: keep us locked in place (thus reducing lag) and allow us to rise our hands. I have to admit that almost nobody raised hands to ask questions: we are all too used to write directly in chat. In any case, since the number of the avatars in the workshop was rather small, it would have been possible to use it.

The other thing that I considered very clever and original was the use of the notecard reader. I explain: the workshop this time was delivered using voice. This is much better from the instructor point of view: no need to type, no problems with tired fingers, more flexibility, no need to stick to a notecard inside a Speakeasy (the content we "read" once it is in open chat). But voice in workshops is not good from the learner point of view: it's easy to get distracted. One has to struggle

with edit window, values, arrows, textures etc (and possible incoming IM, RL small interruptions, etc.) It's very easy to miss an important passage, to forget the exact value one has to enter or to get lost in a messy inventory.

But here the Notecard reader board represented a written text one could rely on, and allowed some independence, rather necessary when the level of skills is very different.

The workshop was divided in two parts: introduction to the secrets of prim modeling and the production of a table and a stool. Both parts went on smoothly and everybody managed the two pieces of furnitures, and event to add a poseball.

Morgen was in all moment very clear in her explanations and helpful to those who had some difficulties, and I think this was the first workshop I ever attended that finished within the specified time. Very good work, Morgen

Observer 2 comments:

[As I did for other workshops, I'm using the analysis grid given us by Marga]

Planning and preparatio:

- Spacial design and layout: Emulation of RL: participants were sitting in rows in front of a board.
- Learning objectives were clearly outlined at the very beginning of the workshop.
- The instructor's discourse was prepared in advanced
- The physical organisation of learning material: participants were given a folder (at the beginning of the workshop) and a notecard (at the end) by Morgen, individually.
- The workshop was free

Delivery of instruction:

- No assessment of prior knowledge, but the workshop was advertized as being for beginners.
- Pre-pared activities to meet the knowledge requirements; Morgen gave an introduction describing the various options in the "Object tab" and asked participants to play with them for a while.
- Conversational flow was done in voice chat. There was also a board showing a summary of the instructor's words.
- Communication dynamics: Tutor -> Learner
- Free position for the teacher, constrained position for participants

- Learning materials were given to participants in two times: at the beginning and at the end. Both times, the instructor gave the items to participants individually.
- Except from the board, no media were used
- Activity was exclusively centred in SL
- Personalization of learning: the instructor used adaptive pathways of communication to come to rescue of a participant who was lagging behind the group
- Pedagogical approach: directive, focused on rules procedures, both process and result oriented

Follow up and evaluation:

- The instructor provided support and feedback via voice chat, sometimes reinforcing some terms by repeating them in the local chat. Done on demand when participants had problems.
- The instructor monitored students' progress visually and asking them questions on their progress
- Quality of feedback was informative
- Assessment was informal.

Recall and transfer of learning:

- Recapitulation was done at the end of the first part of the workshop, since the creation of a stool was very similar to the creation of the table.
- Participants were given a notecard at the end of the workshop, containing all the information she had been giving during the workshop.

Personal comment:

The workshop was well organized both in terms of space (each participant had enough space to work). The workshop objectives were stated at the beginning and all participants managed to achieve them by the end of the workshop. The delivery of content was well paced. The audience targeted for the audience (beginners) was right, even though Morgen also helped step-by-step a participant who was less experienced than the rest.

Here are a couple of tips I'm suggesting for a second go of the workshop:

1. I would shorten the introductory part describing the various options found in the "object tab". Discussing a couple of them and maybe demonstrate in front of the audience how they can affect a prim would suffice. Also, rather than encouraging

participants to play with the various options as they wish, I would ask them to do something specific, to see how a certain option can affect the prim in question (i.e. ask them to hollow a sphere, then a cube and then compare the results) otherwise, participants have no clear idea why their object changed shape.

2. Instead of giving the material for the class to each participant individually, have a giver object that could distribute it. The distribution of the class material can otherwise take a little time and sometimes one or more participants might be skipped unintentionally (I did this mistake at the end of my own seminar: while I had a giver object for the initial folder, I'm not sure why I didn't prepare a similar object for the final notecard, which I distributed to each participant individually: not a good idea).

3. I personally prefer a workshop given in local chat, so that if I lag behind, I can easily go back a couple of lines and catch up. I understand that Morgen's board played the role of the local chat, but to focus on it, one had to leave his/her object behind and then go back to it. Also, voice chat always takes a little while to work, requiring sometimes lengthy initial tests. Actually at the beginning nobody could hear Morgen, probably due to her internet connection (indeed she crashed after a couple of minutes), and we spent some time on that. Also, one participant could not hear Morgen later, because she was a bit too far. In all occasions I saw voice being used, the same problems occurred, so it's a voice issue, not Morgen's.

4. I could not get the poseball to work; even when I tried later, I keep ending up sitting IN the floor (as in a quicksand swamp) and not on the stool. I am really not sure why. On the other hand, the stool works fine without the poseball, so I decided not to waste time to investigate the mishap further.

Well done Morgen.

This kind of interaction enriches all the participants and contributes for the development of collaboration, critical thinking and reflection as well as for the building of the virtual learning community.

The activities which were developed in-world have proved that SL has a great potential for education as other several researchers have already described. On its island, some activities can be checked at the landmark: MUVEnation 110.121.22.

Warburton & Perez-Garcia (2008) [16] defined four key steps to deliver Hands-on Workshops. These steps are visible in the practice described:

- Planning and preparation;
- Delivery of instruction;
- Follow up and evaluation;
- Recall and transfer of learning.

Therefore, it's very important to structure the environment, reflect on our practice and build transferability. It is also very important to set the communication rules between all the participants in order to avoid disruption, and design support for students who get behind. The validation of the workshop is not a closed process; on the contrary, it is an iterative process that is built over time.

Recent research and our practices show that some design patterns¹ can be defined such as sharing experiences, for example, stories/accounts of what worked and what requires improvement (activities, setting, results, our objectives, what we achieved, what wasn't achieved, etc). Another factor is the identification of problems that are common and of the associated forces. Listing the successful solutions is another useful design pattern. Finally, sharing and discussing these patterns facilitate their refinement and the creation of a design language.

This course provided me with some insights to implement a learning project with my students to learn English as a Second Language and develop their Citizenship and themselves as global citizens. This project is going to be implemented on a private island because my students are teens, so they are not allowed in Second Life grid which is for people over 18. On this island there are several schools from all over the world where their teachers and students develop learning projects, interact and collaborate in a virtual learning community.

2.1.5. SL drawbacks

Some potential problems require reflection in order to be undertaken. According to Kovala (n.d.) [17], it takes too much time to be in SL, the content creation and its updates require a lot of space and the copyright raises some issues. Although SL system tries to protect the rights of the content builder, it is not OpenSource as it is in an outsider server. The problem comes with the possibility of losing all the data if the servers are down or if the island is destroyed.

Another problem that needs to be dealt with is raised by content connected to intolerance, sex, commerce, fraud...

Other authors refer the need for improvement of other issues that have a strong impact in communication and interaction between avatars. For instance, avatars don't control the way they look at one another, or the facial expressions very well. The face and the eyes keep the same expression by default, though several progresses are being made in this field. The expressivity is reinforced by the paralinguistic symbols in written text.

Some technical issues must be improved such as lag and crashes and they imply people to spend more time doing a task and therefore waste time which can demotivate people and eventually lead people to reject SL.

3. CONCLUSIONS

Second Life is making an impact in the academic world as it has unique features that potentiate collaboration, sharing, decision making, critical thinking and experiential learning in the virtual learning community.

Nevertheless, educators must be aware of SL challenges when transferring their first life pedagogical approaches to their second life teaching. Teachers need to learn how to teach in SL as Real Life teaching expertise does not guarantee SL teaching positive experiences.

Although there are some constraints that have to be overcome, it is undeniable that SL encourages people to interact and collaborate in a way that conveys a sense of presence that is not found in other media. This virtual world is growing in popularity because it provides *social networking; the ability to share rich media seamlessly; the ability to connect with friends; a feeling of presence; and a connection to the community* (Austin & Boulder 2007)[18].

So far, research demonstrates that SL has a great potential for learning which can be enhanced with the improvement of technology and communication. This needs further improvement but it has already provided evidence that SL can help to develop skills concerning socialization, peer and group work, critical thinking and problem solving.

Deutschmann (2009) [19] states that *The key element here is, according to Svensson, not the technology, the simulations or the effects per se, but the fact that SL and worlds like it allow for meetings with “real*

people ‘playing’ themselves or having alternate personas), for working collaboratively with remote participants” and, for the creation of a “place and a unified spatial interface” for such meetings.

To sum up, we can conclude that SL has a great potential for education, being required that educators identify and select the strategies and activities that are more appropriate for face-to-face context or virtual context.

Nevertheless more research is required to make this world more accessible and easy to use so that educators can optimize these virtual worlds for the teaching and learning process.

REFERENCES

- [1] De Lucia, Francese, R., Passero, I., Tortora G., 2009. Development and evaluation of a virtual campus on Second Life: The case of Second DMI, *Computers and Education*, 52, 220-233.
- [2] Bhattacharya, K. & Han, S., 2001. *Piaget and cognitive development*. In M. Orey (Ed.), *Emerging perspectives on learning, teaching, and technology*.
- [3] Bruner, J., 1960. *The Process of Education*. Cambridge, Mass: Harvard University Press.
- [4] Galloway, C. A. 2001, *Vygotsky’s theory*. In M. Orey (Ed.), *Emerging perspectives on learning, teaching and technology*.
- [5] Jonassen, D., 1992. *Evaluation constructivist learning*. In T. M. Duffy & D. H. Jonassen (Eds.), *Constructivism and the technology of instruction*. Hillsdale Ealbaum Associates
- [6] Brown, J. S., Collins, A. & Duguid, P., 1989. *Situated Cognition and the Culture of Learning*. Education Researcher.
- [7] Wenger, E. 2000, *Communities of Practice and Social Learning Systems*. London.
- [8] Linden Research, 2006. What is Second Life? Secondlife.com, Retrieved February, 8, 2009 from <http://secondlife.com/whatis/>
- [9] Terdiman, D., 2004. Campus life comes to Second life, *Wired News* 2004, Retrieved February, 8, 2009 from <http://www.wind.com/news/culture/0.65052-0.html>
- [10] Livingstone, D. & Kemp, J., 2006. *Massively multi-learner: recent advances in 3D social environments, computers and information systems journal*. School of Computing, University of Paisley, volume 10, No. 2, 2006.
- [11] FitzGerald, S. & Kay, J., n.d. *Second Life in Education*. Retrieved November, 10, 2008 from <http://sleducation.wikispaces.com>
- [12] Warburton, S. 2009. Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching, *British Journal of Educational Technology*, 40, 3, 414-426.
- [13] Pereira, A. Mendes, A., Morgado, L. Amante, L. & Bidarra, J. 2008. Universidade Aberta’s Pedagogical Model for Distance Education, Universidade Aberta: Lisbon. <http://repositorioaberto.univ-ab.pt/>

¹ Pattern – a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same time twice” (Christopher Alexander, 1977 in Warburton & Perez-Garcia, 2008) [16].

[bitstream/10400.2/1295/1/ModeloPedagogicoVirtual.pdf](#)

- [14] Morgado, L. Pereira, A. & Mendes, A. Q. 2008. The “Contract” as an Instrument to Mediate Learning. In Mendes, A., Costa, R. and Pereira, I. (Eds.), *Computers and Education Towards Educational Change and Innovation*, 63-72, Amsterdam: Springer Science.
- [15] Martinez, R., 2007. *Before teaching in second Life be a Student*, Retrieved May, 22, 2009 from <http://before-teaching-im-second-life-be-a-student2853.ppt>
- [16] Warburton, S. & Perez-Garcia, M., 2008. Design for Learning in Virtual Worlds: the tension between control and pedagogic approach, Retrieved June, 20, 2009 from <http://www.slideshare.net/stevenw/design-for-learning-in-virtual-worlds-presentation>
- [17] Kovela, S., (n. d.). 3D Virtual Worlds and Education 2.0: The ‘Second Life Perspective’, School of Business Information Management, Kingston University
- [18] Austin, T, Boulder, C., 2007. The Horizon Report, 2007 Edition. New Media Consortium and EDUCAUSE Learning Initiative. [Online], Available: http://www.nmc.org/pdf/2007_Horizon_Report.pdf. [27 November 2008].
- [19] Deutschmann, M., 2009. Future Directions for Learning in Virtual Worlds. In Molka-Danielson, J. & Deutschmann, M. (Eds.), *Learning and Teaching in the Virtual World of Second Life*, 185-189, Trondheim: Tapir Academic Press