“Using Second Life for Learning Art: What have we learned?”

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1. The Second Life and Education

Second Life: A 3D virtual world

Second Life (SL) is a 3·D MUVE[2] web environment with multiplayer interactions which combines graphics, audio, movement and playful elements. It is a virtual environment where any person can participate creating his own character called “avatar” (Grané and Muras, 2006; Liao, 2008).

SL, created by the Company Linden Lab in 2003, is a free application (Mas and Marín, 2008) and has several uses in business, games, social interaction, and education[3]. Even though there are different programs of this type (Grané and Muras, 2006), SL is considered, at this time, the environment which allows more experimentation, collaboration and immersion compared to other virtual learning programs (Haycock and Kemp, 2008; Salmon, 2009).

Therefore, all that exists in SL is what the users or inhabitants, in its majority, create and do (Grane and Muras, 2006; Iribas, 2007). Once the user has an

[1] Avatar-PUCP is an interest group integrated by students, graduates, administratives, and faculty directed to explore, develop, and evaluate the different virtual environments and technologic resources that Second Life (SL) and videogames offer. It was created in March of 2008. A specialized team in Second Life finds it particularly interesting to investigate this environment as an opportunity to achieve significant and collaborative learning, incorporating new ways for teaching and learning in higher education through this virtual world. E-mail : grupo_avatar@pucp.edu.pe

[2] Three dimensional multi-user virtual environments (3D-MUVE)

[3] IBM and other companies as Dell, British Petroleum and Intel are investing millions of dollars in virtual worlds, including 25 islands in Second Life. Many universities have a campus on SL (Gronstedt, 2007). Companies as Adidas, Reebok and other entertainment companies are joining SL because they want to be part of this potential market (Grane and Muras, 2006). Coca Cola, Reuters and MTV and even governmental entities as NASA or Embassies also use SL (Sanchez, 2007).

avatar, he can start to be in contact with the whole universe and all the possibilities they can find are huge (Sánchez, 2007). It is the chance of creating items, actions, structures and the ability to transmit emotions through the avatar's gestures (Iribas, 2007), what makes SL a completely interactive environment (Mas and Marín, 2008)

Salmon (2009) and Warburton (2009) support that SL is changing business, education, and social interaction areas because of its low cost, its high value for learning and interaction and because the "barriers"[4] to get into such environment are easy to overcome.

SL is the web community with the fastest growth and lots of the world's biggest organizations plan to be a part of it in the future (Gronstedt, 2007). Lienden Lab´s statistics show that the number of the resident users in SL grew quickly over these years; increasing the interest of the educational institutions for this environment (Kirriemuir, 2008; quoted in Salmon, 2009). Gartner Inc (2007) says that by 2011, 80% of Internet users will have an "avatar" and will actively participate in some type of virtual world (Salmon, 2009). In the same way, Savin-Baden (2008) predicted the need of integrating real world activities *(RL: real life)* with those in a virtual world *(SL: second life).*

Regarding the difference between SL and videogames, which are closely related, we have that the majority of the things (objects, constructions, etc) in SL have been created by its users or residents, who manage the language of 3D to build everything. Furthermore SL is not aimed to a specific goal, its process is not structured by other person and therefore there are not steps needed in order to meet a challenge or reach a goal.
Thus, SL`s tools can easily be used by educators, to illustrate technical concepts. For example, one of the SL advantages is that the sense of scale and perspective can be manipulated, letting it, for instance, fly through a reticulate diagram, minimize big systems or burst a chip (Gronstedt, 2008). In general, SL can be described as a more flexible space than videogames, allowing users to act more freely. Because of all these SL has a great potential for education.

Second Life potential for higher education

3D virtual worlds are being used in education because it has been found that they allow using new methods of teaching and learning. (Grané and Mura, 2006; Galagan, 2008; L'Amoreaux, 2008; Jones, no year).

SL is a social tool which takes us to an online interaction where pairs interact breaking hierarchies and removing in this way the geographic frontiers existing

[4] To use SL it is required: to have a 800MHZ PC or more, with at least 256MB of RAM, or a 1GHZ G4 Mac or better, with at least 512MB of RAM. In PC you need Windows XP, 2000 or superior; and in Mac, Mac OS 10.3. Also, a graphic card is necessary (if you don't have one, SL offers free download software in the web). A Broadband Internet Access is fundamental (Iribas, 2007).

between people. Because of this SL is replacing companies and educational institutions' videoconferences. The incorporation of voice in SL's environment had a profound impact as an educational resource (Gronstedt, 2008).

One of SL's best attributes is what Hamilton (quoted in Gronstedt, 2007) calls "*the sense of self*", which refers to the possibility of the users to express or describe themselves, regarding who and how they are by creating a specific esthetic in an avatar. The possibility of the avatar customization is another characteristic that promotes the use of this resource into business or educational fields.

In this sense and specifically in higher education the use of SL is being considered in two ways. On the one hand, there are many buildings in SL that are the exact replicas of campuses or buildings that are commonly developed with marketing purposes (to advertise courses and programs); and on the other hand, there are other educational institutions that develop museums, auditoriums, art galleries, hospitals, science labs, construction spaces, etc, in order to employ SL in the learning process (Salmon, 2009).

The first institutions that adopted SL for educational purposes were schools of medicine to carry out practices with avatars and avoid the use of animals and humans in risky tests. In addition, business subjects can also be developed through the cases of virtual studies (Salmon, 2009).

Salt, Atkins and Blackal (2000, as cited in Salmon, 2009) mention that by 2014 all the universities will be or will need to be part of SL or another virtual environment. This idea is very close to what is happening nowadays, when SL places most of the universities together, being North Americans, the pioneers.

Among the main universities that use this tool we can mention: San Jose State in Silicon Valley, North Carolina University, California University in Berkeley, New York University; Harvard, Stanford, San Diego State, Ohio, Hertfordshire, Dublin University College, Phoenix (Sanchez, 2007) and others in Europe and Asia. In Latin America, the use of SL is just beginning. In Peru in particular, Pontificia Universidad Catolica del Peru is one of the most involved in SL.

While it is a fact that universities are incorporating technological changes to their daily work; it is considered that beyond informatics tendencies and innovations, it is also necessary for them, to adapt to the characteristics of their students. Nowadays, students are more capable and determined to work with technology; they are used to communicate, interact and learn through internet, videogames and 3D environments. In addition to this, students are used to choose and learn in a more autonomous way, by using computer programmes and internet. In this sense, the strength got by them has never been as powered as now, when using these 3D virtual worlds (Salmon, 2009).

Peachey (2007, quoted in Warburton, 2009) refers that computer games have increasingly become more dynamic and caused a great stir into education, as much as the different virtual worlds like SL have.

Regarding the use of this tool into education, Peachey (2007) sums up.

- Interactions: It provides opportunities for social interactions among a group of people and their communities.

- Visualization and contextualization: It allows users playing and creating contents, sometimes inaccessible in real world, since they are distant, expensive, imaginary or impossible to access.

- It provides opportunities to know and explore other cultures.

- It makes immersion in 3D world easier, having a strong sensation of "being present"

- Simulation: It allows playing contexts, sometimes difficult to know in real life, taking it as an advantage for educational purposes (Salmon, 2009). According to Salmon, these simulations allow the apprentices not only know or look at determined place, but also feel as if they were there.

All these SL contributions show us that this resource allows innovating teaching methods. As Mas and Marin (2008) refer, SL drives educational characters to reconsider new teaching and learning methods. What is more, by using avatars, and when building medieval villages for example, it is also possible to learn history, or study the planetariums (Mas and Marin, 2008).

Every time, there are more teachers who become aware of the expiry of contents in paper and slates, and ask for connectivity and virtual tools availability (Sánchez, 2007).

A huge growth has been observed in the last three years, letting L'Amoreaux (2008) refer to SL as a tool with a great future, especially if it is applied to education. For that reasons, several universities are offering spaces and educational programs in SL. Many others are creating consortiums and organizations around the world in order to work in shared projects in SL. With all of this, SL will continue influencing new and effective models for distance learning method.

Despite of SL potential, implications and qualities for higher education, Salmon (2009) points out that in order to have a better performance working with this technology, it is important, at first, to deal with the initial skepticism of teachers and university authorities and also, to deal with some difficulties to access websites in university computers labs.

The present research aims to contribute to the knowledge of SL by giving qualitative information about the potential of SL that we pretend to contribute in formative processes at universities and other educational purposes.

Is it possible to learn by using Second Life?

Even though we can find different SL applications in education, investigators and educators still have the following questions: How would it be possible to incorporate SL into the education process? How could contribute to this goal? (Mas and Marín, 2008).

One way to use SL in education is through the transfer of classroom activities to virtual environments or when teachers ask their students to do particular tasks using the virtual environment to enrich the student's experience (Wagner, 2008).

Even though it is possible to invite students to have virtual classes through 3D virtual worlds, in order to do different tasks like preparing a slides presentation, some videos or just discussing about certain subjects; it is considered that innovation and potential of 3D virtual environments stand in the possibility of activities simulation.

For students, these virtual world's experiences become more attractive when they have a task to do like organizing a company of electronic trading, running an e-business, carrying out a test or making a construction in a virtual lab (Wagner, 2008). The potential of this tool is on the active learning side; learning by doing instead of learning passively.

Additionally, students can create their own graphic and textual contents in SL; immersion into 3D virtual worlds allows exploration and interaction with significant elements in this virtual world (Cheal, 2007).
Furthermore, SL allows creating simulations, role plays, educational material and risky situations tests, which are controlled by users in virtual worlds (Cheal, 2007, Galagan, 2008, Muras, 2008).

According to Cheal's investigation (2007), learning features according to the Bloom taxonomy of cognitive domain, have an adequate relation with the possibilities of exploration and inherent interaction in 3D virtual worlds. For example, we can mention the *knowledge* category when a student learns and goes through SL; the *analysis* category, when a student asks questions and answers them, just to decide what different ways he/she has in order to build something realistic which contains a few prims; the *evaluation* category when he/she reflects on the convenience of building a cathedral with determined features like a roof or, just let avatars fly; the *creativity* category when using construction skills to create a whole cathedral" (Cheal, 2007). It has been observed that when using SL, it is even possible to reach the highest levels of thought (even meta-cognitive processes).

As Cheal refers, (2007) practice is necessary for beginners, as far as they get experience and control at SL; in consequence, they achieve a greater learning and get more advantage of this environment.

As beginners use SL to personalize their avatars, they need to acquire both basic use of gestures, movements and camera (Salmon, 2009); as much as the different ways to explore new places, in order to achieve all the activities and group's events presented in the environment (Cheal, 2007).

Grané and Muras (2006) say that the most important learning a user can get is the simple fact of being part of SL, and participate in its development. Just by participating, users can learn a great variety of subjects because SL is full of designed spaces to learn (there are tens of museums, replicas of places, libraries, newspaper libraries, labs, conferences, etc).

For example, the avatar Aura Lily has recreated the Filae Island in SL, located in real life, at the Nile River's bank. In her recreation, she shows all the architecture, art, tools and lifestyle of the old Egypt. Any user can ask for a guided visit through this space (Grane and Muras, 2006).

Since the first moment at SL, we can quickly observe that virtual worlds make experimentation easier and activate learning; Also, by using avatars, students can have the sensation of being part of the environment and dialog in a new world (Salmon, 2009).

Therefore, using SL in education would help students to adopt an active role over their own learning. Students must get involved into their own processes through experimentation, construction and manipulation of different objects in the virtual world (Grane and Muras, 2006). Then, SL reproduces the modern cognitive science tendency regarding what a "*good learning*" is.

Jones (no year) and Salmon (2009) agree on the potential of SL to allow the students to learn actively, to build their own knowledge through experimentation and to discover in an action environment. Irribas (2007) also says that, when using SL, learning experiences are incited, since users can develop abilities, try new ideas and learn from their mistakes. The learning of different objects or contents can be easier to learn and incorporated if students experiment with them (Sanchez, 2007). All of this would also permit students to develop abilities in order to be prepared for similar experiences in real world.

The learning through SL constitutes a significant process described by Ausubel, which is achieved when a student himself, is part of the problem; when writing, giving an opinion, experimenting, making a mistake, or even when creating something new, learning becomes more meaningful (Palacio, no year).

Other advantage of using SL in education is that it works on students' creativity. SL enhances the creative abilities in spectacular ways (Mas and Marin, 2008) since users can create different applications (avatars, museums, cities, etc) from nothing; they need to play with their imagination in order to use SL (Iribas, 2007).

From the teaching point of view, SL allows teachers to recreate real worlds or even create completely different ones, sometimes unapproachable for students,

helping these last ones reach concepts and experiment different activities and situations (Haycock and Kemp, 2008). They can also develop abilities in order to solve problems or face challenges in the real world. It is considered especially adequate for simulation of situations that, due to unapproachable costs or expensive materials, are not possible to afford in a real teaching setting.

Regarding student's motivation, investigations have proved that learning through SL can become an extremely funny and entertaining experience, which could increase students motivation (Grane and Muras, 2006; Muras, 2008).

Besides that, some first assessments collected by Nolan (quoted in Grane and Muras, 2006) when interviewing some students, point out that they consider the courses taken in SL are totally different. On the one hand, SL allows students to participate in interactive sessions which they would never possibly do in a real class. Another aspect appreciated by students, is the possibility to interact with other peers around the world and, exchange opinions with them. This last one is considered not only as a simulation of human interactions but as the appearance of human interactions in a new format.

SL also benefits interaction, as students have the possibilities to access different groups or 3D recreated places as soon as they enter into these virtual worlds. Users can interact with others (through their avatars) when using a program of instant messaging (written and oral). Furthermore, SL has incorporated a simultaneous translation system which allows users to talk to other persons in different countries, without any problem when using a different language (Mas and Marin, 2008). This interaction can also be simultaneous among several agents to, for example, when building a particular object collectively in SL (Iribas, 2007).

Due to it, Wagner (2008) points out that 3D virtual world are also propitious for group work distribution. It is observed, for example, when the developers of Second Life, Linden Labs Company, summon to meetings in the *metaverso*[5], and users from different parts of the world attend to do some collaborative work, making this experience meaningful and international. In this sense, SL potential to promote team abilities is also huge.

Finally, other advantage when using SL in higher education is that students don´t need to move to a physical space for having classes anymore, since they can do it from their own homes or jobs (Sanchez, 2007).

[5] *Metaverso* is a term used by Neal Stephenson which refers to 3D virtual environments in cyberspace (Iribas, no year)

2. **Description of experience: learning session**

In October 2008, after several months of exploration, experimentation and compilation of information about SL, Avatar PUCP Group was prepared to initiate a first learning experience.

After contacting and showing the SL environment and its possibilities to the Art professor, who had been always interested in videogames for educational purposes, we were able to do an articulated work in order to run a learning session as a model inside the SL environment.

The course selected by the professor was Geometric Drawing 2, an obligatory course of the Faculty of Art. The selected class in PUCP, to experience SL, was *"Aerial perspective, variation of the observer's height and proportions".* The course had four class timetables, taking just two of them to carry out with the experience.

The objective of this learning activity was to let students develop a composition where they could integrate elements, in a scenario or landscape, giving them the chance to tackle some subjects through a perspective register drawing: three points perspective, without any *H/V* axis of reference (space with no gravity dynamic – floating objects with one or two characters) and aerial perspective, variation of the observer's height and observed proportions.

Days before the class, Avatar PUCP Group organized an introductory meeting called "Welcome to Second Life", for all the participant students, teachers and teacher in charge. The aim of this meeting is to have a first approach to the SL environment; all this in order to let them know about some basic tools for communication, edition and construction before developing the scheduled class. Only 50% of the students but the whole staff of teachers attended this meeting.

Two weeks before the class, the course planning and preparation of the environment and materials was ready. During this time, the teacher in charge of the activity had a consultancy team composed by a teacher with a broad experience in virtual education designs, a communicator, specialist in audiovisual and multimedia materials, an educational psychology and the support of the Academicals Informatics and Virtual PUCP Directions of the university[6]. Independently, the teacher in charge explored and investigated about the use of SL.

The class was developed during its usual schedule, but this time, all the students and teachers were in a lab, working on a computer. The teacher in charge of the activity was sitting in a different place, so that students could only communicate with him and with among them through the SL environment.

[6] More details about the activity in "Activity report in SL Avatar Group PUCP" November 2008.

The class in SL was structured in two different moments. During the first moment, everybody was taken to a space, very similar to a classroom where you could see some chairs and a slate; in this space, the teacher was able to explain his subject through power point slides and a video. In the second instance, avatars moved to a sandbox to make constructions in SL, Students were asked to form groups while getting assistance as far as they needed it.

Due to only 50% of the students attended the introductory session on how to work at SL, four experienced members of Avatar group stayed during the class sessions, in order to assist the students and teachers who could have problems with the environment, controls, movements, etc.

3. Assessment of the experience

In this part, we present the methodology and results obtained from the analysis of the activity, the conversations with students, teachers and Avatar PUCP Group members during the development of this first activity.

For the *Pontificia Universidad Catolica del Peru*, it is necessary to do this assessment in order to systematize innovative experiences and guide future uses of 3D virtual worlds for learning processes. Also, we consider important to give a report about this experience to everyone who is interested in using SL in higher education.

Methodology

The present research intends to describe opinions, perceptions and reactions of the different people who participated in this first SL learning activity.

After classes were done, two groups were chosen. In each of these groups, 6 students participated as volunteers in a focus group.

Regarding teachers, we can differentiate two groups: the teacher in charge of the activity who participated in the planning process and led the SL activity; and the other teachers who performed as facilitators, supporting students with answers for their doubts. In order to know about their opinions or perceptions, they were interviewed individually.

The information was processed and analyzed according to each group and subject.

Results of the first experience using SL in the class of Art

In this part, we will describe opinions, perceptions and reactions of the students and teachers who participated in this first SL learning activity.

In order to make the description easier, we organized this information in:

- Reasons that motivated this team for using SL in class;
- First impressions regarding SL use;
- SL learning and teaching processes;
- Possibilities for interaction;
- Potentials when using SL.

a. Why to use SL as a teaching tool?

Considering it was the first time the Arts teacher worked with SL, with no previous experience, and that this was to be used in the university, also by the first time, we decided to ask him some questions in order to know about his experience. These results can be summarized in two main points:

The first one, regarding the SL environment possibilities: ease to use, possibilities for objects' visualization using different angles, possibilities for independent construction, communication and interaction, and the learning objectives set for these sessions.

Secondly, he considers that using innovating techniques inspire students and let them connect directly with their own interests, especially when using new technologies. Considering students´ interests and needs is crucial within higher education proposals at this time, as Salt, Atkins and Blackal (2000) refer.

> *(Reasons for using SL in class)*
> *" …young people are able to use it easily, and it becomes even more attractive, because they are always linked to technology… it's a common language for them, when playing videogames, using multimedia because they can find music or any other elements to interact; objects are intelligent you are able to touch them and they mean something to you; what is more, you can make objects, shapes; all that seemed very interesting to me, it's a language which youngsters are very familiar with (teacher in charge).*
>
> *" … I had never accessed this program before, but I did know something about it. It was like daily life but in a computer; I thought it was more like a game, maybe like chatting, but I didn't know that I had the chance of doing these things, running a business or building things." (Participant teacher)*
>
> *(Teacher's reaction when facing a new challenge)*
> *"… When the teacher told me he had thought to give a class using SL, I thought it was cool; who better than youngsters to do it if they are keenly aware working with this language?" (Participant teacher)*

As teachers had said, the aerial perspective and floating objects class was adequate to be developed in a 3D virtual world. According to the teachers and the rest of the staff, SL provides tools, spaces and useful elements which promote the development and integration of the two subjects. It allows teachers to show this integration visually, creatively and in a simple way.

> *"… the material to be used, was to aerial perspective, using landscapes. as there are many beautiful islands and other constructions in SL to use, very figurative; others very surrealistic…"(teacher in charge)*
>
> *" …the interesting part of creating an object is that not only dimensions can vary but it can also be weighted or it can even float; something that in real life is impossible to do, but there (inside SL) I can create any floating objects…" (Teacher in charge)*
>
> *"… If we are to see what perspective drawing is, we should consider the representation of reality and also, our ideas´ representation… In our course, we always consider that permanent relation between drawings, direct observation and imagination that is part of our subjective… Second Life is almost in the middle, because it is virtual reality, right? A reality where you can have many possibilities, much more than we normally do, because of that potential to imagine… it is also a manageable reality." (Participant teacher)*

We can point out that according to the teachers who participated, SL gives diverse elements which can be used to explain their classes in a creative, audiovisual and simple way. Teachers have also the chance to raise examples and activities related to their own objectives.

b. Students and teachers' first impressions when using SL.

Students and teachers who worked in SL had varied opinions about using it depending on their own experiences and information they had about other similar environments.

Some students who had heard about SL before, associated it with the game "The Sims", like any other 3D representation environment. However, none of them had interacted inside SL actively; and those who already had an avatar, visualized it basically, as a tool for socialization and not for learning.

> *"…I had already heard about SL... Before this project started, I already had a character… the first time I used it, I quit because it was too cold for me; in that moment I preferred being with my friends in real life rather than making new ones there. I left it there until the model class started…" (Art student)*

The students who had no experience or ideas about what SL was, said that they felt the need of receiving information before the class:

> *"…What happens is that we were told about the class a week before; of course, I had never heard about it, I talked to some of my classmates and discussed on how to create an avatar, among other things we did not know. I didn't know that existed" (Art student)*

Once the student's avatar got into Second Life, the first impressions were very positive:

> *"…Mainly I got surprised because I thought we were going to use the program and that was all, but there was even a classroom, there were desks; I got shocked because I said yes!, it's like real, we are working here; that really impressed me" (Art student)*

> *"… I thought it was interesting because I had never interacted in any 3D programs or made any objects, not even close to real measurements. You had to deal with the objects composition and set a character to see the scale; it seemed to be interesting because it was the first time I was doing that." (Art student)*

> *"… As it was something new, everything surprised you; I can fly or get dressed up, that is it" (Art student)*

These testimonies match perfectly what Salmon (2009) points out, one of SL initial, motivating and attractive aspects is the possibility of customizing its own appearance, change hair, clothes, and gestures, and also define the body's outline among others.

According to the teacher in charge, he did not have more than a month working in this environment, but it was enough to see that it was potentially effective for his own teaching experience. As it is observed, both teachers and students agree that motivation for learning about a new environment was the key to develop the class.

> *(First impressions in SL)*
> *"… The first time you get in, you have to fly, you have to run… it is like when somebody takes you somewhere and you can fly, it is a place where you can wear the clothes you want; at that moment you want your hair longer, or maybe shorter, you want to wear heeled shoes, flat shoes, a skirt… If I want to change my clothes, I do it at that precise moment; then, I can jump for a while, unexpectedly I can make a somersault, I can just press a key, bow and start talking, I can send a message… There are too many things… It's natural when you get in, you want to do many things; it's like a little puppy trying to bite a shoe; in that moment, as old as you are, you're like a child … it also happened to me; the first time I got in, I flew, to see how it felt…" (Teacher in charge)*

In the case of the other teachers, some of them had the chance to know the tool, just days before the class. They were helped by the teacher in charge of this project.

> *"… I met Pepe (the teacher in charge) a couple of times, just before the class started, we went to PUCP (PUCP at SL), we saw the place… looked over there; I could go around there, it was the space where we were going to move on, we both looked around for a couple of times; he taught me some moves, even inside.. He also taught me to know the space, not the thematic, nor what we were going to work, but the whole SL environment…" (participant teacher)*

As the teacher says, during the process of learning, there is a need for exploration and it cannot be skipped. That is why Avatar PUCP Group members, responsible of the activity, and other authors as Cheal: 2007, Salmon: 2009 and Grane and Mura: 2006 agree that it is important to give beginners some time for going around.

According to the participant students and teachers, this exploration stage at SL is full of innovation and exploration, and requires some support during the first activities. The aim of this accompaniment is to deal with difficulties, initial doubts, control management, etc.

Even if SL is an environment which allows us to work autonomously, there is an initial need of constant consultancy because there is always a learning activity to achieve, like to develop some products or do some tasks within a determined time and programming.

> *(about the need of present support)*
> *"…there are persons who did require a physical person to help them out, maybe as an initial accompaniment…" (Art student)*
>
> *"… That's good at first, then you can do it by your own… that happened at the beginning, when nobody knew about it; but now we know, we can manage to do it; while we are both at home, we keep on learning a lot." (Art student)*
>
> *"- Yes, because some things were very complicated, mainly those things regarding the keys, writing a text, it was better if they could come (people who supported the activity) and tell us where the button or the shape were…*
> *- So, if we learnt how to use the program, we wouldn't need the teachers…*
> *- Sure, but we didn't know, we called them to help us with the program, we did not ask anything about the class, but the program itself". (Art students)*

Because of the set schedules, and not having had 100% of the students in the SL introductory training session, there was more need of accompaniment or

support in the classroom. So, we can conclude that if participants get more time for SL exploration at the beginning, they can investigate and interact without any kind of pressure, like time for instance.

Even though, some students say that the first experiences when using SL can be a little difficult, their performance and assessment get better after practicing. Possibilities for learning, not just formal training increase. Mechanisms of support in an environment characterized as "friendly" and oriented, give students the chance of "meeting" other avatars which can help them in the process of learning as two of them mention:

> *"It's just matter of getting into the subject… because if you just go once every five hundred times, you will be completely lost… you have to get in, investigate, let other people teach you, let them tell you what to do; and also you have the chance of talking to people from other countries, they also know, let them teach you, that's good…" (Art student)*
>
> *"You can also have classes there; there is a center, Unihispana; they teach you from basic…" (Art student)*
>
> *"The program is not that complicated, it's ok, and you can understand it easily as you have options that explain you what to do everywhere …*
> *It is didactic, if you don't know something, you just click and that's it. (Art student)*
>
> *"…It's easy; I met a guy who makes objects similar to spaceships; the place is cool because there are people you don't even know but help you; there is a lot to do there; …" (participant teacher)*

It is clear then, that, even though SL is now an unknown environment for students and teachers, it motivates and allows them to perform easily in this environment, just by receiving some help either present or virtual.

c. Using SL within a learning process: effects on the students

We definitely consider students' generational features and previous knowledge of 3D construction programs as flattering factors for this experience.

As a teacher said, using SL is perceived by young people as a close and recreational language which allows them to create things:

> *"They were born playing with computers and Nintendos; this language is very natural for them, so talking about games becomes more recreational, and lets them create all they want; I think it gets them closer and hooked on the program…" (Participant teacher)*

It's important to point out that in the case of Art students, working with SL caused an almost immediate connection with commands, controls, and/ or with

the organization of other technologic programs like Photoshop, Corel Draw and AutoCAD, all used during the artistic process.

Even though some of these programs can be used in order to make constructions, get textures, similar colors or even do something with a better quality; the big difference is that while working in SL, users become part of the program and are able to interact with other persons and constructions inside the same program:

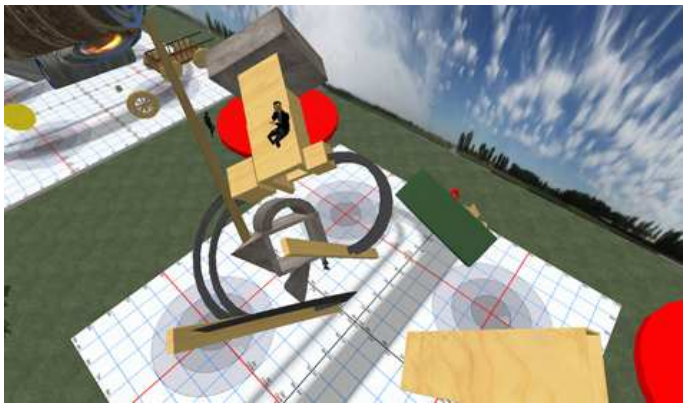
> *"But, let's say, SL has a plus, something more than 3D, it has something else, something that does it more interesting… of course, it is more since you stand there; you become part of the program…" (Art students)*

> *"…yes, therefore AutoCAD is a little complicated, there was another one, simpler, it was easy to understand; if they showed me SL without telling me anything, I could investigate by myself, as everybody could; you don't need someone to help you.. it is easy to understand" (Art student)*

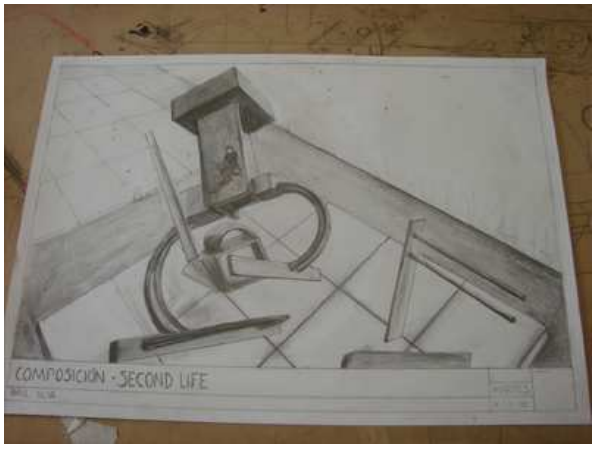
Based on what teachers mentioned and through the visualization of the students' products, it's possible to say that we achieved to **get the learning results expected** into the aerial perspective course.

> *"Most of the students who attended the sessions and used SL took real advantage while doing specific tasks. What is more, besides the short time students had to work at this environment, there is a report of very high levels of constructions. (Activity's report, November 2008)*

Samples of some items made in SL's class and their final products:



(Picture of an object's construction)



(Student's composition)

Picture of a landscape selected by an Art student

Landscape drawing, Art student

It is also interesting to say that having an experience in SL let students evaluate themselves on the development of some objectives:

> *(about learning objectives achievements)*
> *"… in one sense yes, if you could copy the pictures (of the performed constructions), you could see that the drawings were good; I mean, when you rotate objects, you can see the lines; when we reached Tuesday (the next class), I saw my drawing, I did my circle and everything was okay, so it was good, it didn't deform, the graphics were good and there were no mistakes…" (Art student)*
>
> *"… I think that the importance of SL is that at the end, artists have to do the product onto real material, what really helps here is its compositions; then, that's all you need, to finally do it … and that's cool…" (Art student)*

Apart of getting the objectives, this experience lets us see that using SL is propitious for autonomous learning, exploration, creativity, meaningful learning and collaborative work.

After this period of initial exploration, most of the **students' motivation** was still alive. According to some of them, what happened in the model class was something they weren't even able to imagine. Everything that was done in the environment made them surprised.

Having the sense of interaction (communication, movement, construction, etc) in a virtual environment, let them have a different perspective, compared to that one they were used to, when working with other kind of 3D software.

> *"…I got mainly surprised because I thought we were going to use the program and that was all, but there was a classroom, there were desks, it shocked me because I said yes, it's like real; we are working here… that impressed me"*
> *(Art student)*

> *"SL is more like playing with your imagination and setting it on a screen… it makes you live a very personal experience, insofar as everybody moves or looks from his own Avatar, which represents his own view…"*
> *(Participant teacher)*

As Wagner (2008) points out, even though it is possible to repeat classes' strategies in SL, like being seated at a desk or look at the teacher's slides, the most fulfilling experience, regarding learning, is the possibility for students to create products inside SL.

What Wagner mentioned was observed in the experience. Even though a "traditional class" was developed at first, the most outstanding part of the experience was the one when observing objects' perspective construction. Then, the perception on how the activity allowed boosting their works, plates, and spatial memory, and the chance for interaction and observation from different dimensions.

As Grane and Mura (2006) mentioned, students have great chances **to get involved into their own learning processes**, through experimentation and manipulation of different objects in SL.

> *(Objects' construction in SL)*
> *"… So, even if you don't have it physically (the constructed object) you can play it again, it remains in your memory too, … you see it from different angles, because it's not a flat drawing… it is a three-dimensional learning, that becomes the most valuable experience I have ever had …"*
> *(Participant teacher)*

> *"… Having the chance of seeing it (the constructed object) in different perspectives, far or close, you appreciate it in different ways, take thousands of pictures and use them to make plates…" (Art student)*

> *"SL is good because it lets you have a different vision; being part of reality putting yourself as a scale and doing things as if it is true." (Art student)*

> *"…It was good to me because it goes exactly well with what we are seeing in two-dimensional spaces, and better now, we are reflecting that three – dimensional side onto the two-dimensional one.*

However, through using SL, we reflect that two – dimensional onto three-dimensional side. Then, I think it is better to see things from different angles; the difference is that when we do it, there is just one angle…" (Art student)

"I opened my mind when I made my sculpture, my three-dimensional object, it was like getting free, doing things I had never done before; I moved shapes, it was pretty free… I did something I had not been able to do here, I did it there; I guess I took lots of sticks and bent them, I took many hoops. There were people who made planets; if you want to do that here (in traditional classes, even small, you have to buy your own material; there (in SL) everything was so easy"
(Art student)

Generally, apart from the learning sessions developed by the teachers, using SL is closely related to what we want for Art students, regarding **spatial intelligence.**

"… There is something that is related to spatial intelligence; some time ago, we were talking about different types of it, and we found out there are some other kind of intelligences, auditory and visual. Spatial intelligence is the one we have to stimulate in Art and Design students. We refer to two-dimensional plates when our existence is three-dimensional. That environment (SL) is giving us the chance to have a three-dimensional view; something we cannot achieve but with models never representations; when you are small, it is just your imagination, but when working in virtual spaces, you are the character and can easily move to other places…" (participant teacher)

We were also interested in knowing **students' perception**, regarding this learning activity in SL. On the one hand, we have answers of some students who describe SL as a simple environment, free:

"It was simple; at any moment you were told to sit, listen, go to your sandbox and create the composition you wanted; then draw it; it was really simple" (Art student)

"And pretty free… you could paint the elements you wanted; I mean we were able to float; you could put all you wanted in, shapes, textures, etc"(Art student)

On the other hand, we have answers of some students who had some difficulties when using the environment; some of them because of the way on how to make movements and constructions was not so easy, instructions were not clear enough or even, because of the time assigned for the activity was too short for them…

"… Maybe it was the time, I didn't learn how to use it well so I didn't take advantage of it, I learnt to fly, that was amazing; flying was funny,

going to other place; there were also people to talk to and you didn't even know who they were; when I was to do the tasks, I didn't understand how to do it"
(Art student)

"For example at the moment of building solid objects, I got a little bit confused about how to use controls, but I think that with a little more of practice, it is going to be easy…" (Art student)

"…I think that at the beginning, when we were told to create something, it was just to investigate and play, create something and take pictures; I think there were people who never understood we had to take a picture at the end… we were not rightly informed, we were told to play, investigate and create things; after that, he (the teacher) said ok, take your pictures for the plate" (Art student)

It is important to say that students' answers about the activity were affected by the kind of activity planning, insufficient hours for practice in the environment and creativity itself. The activity had to be done and fit the suggested timetable (a group had 4 hours straight, whereas the other one had classes in 2 different days, 2 hours each).

Even though, learning in SL is fulfilling, structuring it in a "normal" schedule limit times, without having a basic control of the environment; not respecting their own space for creation, learning styles or exploration pace caused trouble for some students.

(about the time assigned for classes)
"…classes were directed for geometric drawing; we should have had two orientation classes about using SL…we should have had more time for creating objects; that was the most important part" (Art student)

"… I think there was not enough time; at the end of the class, everybody was in a rush because we had to take a picture of what we had done, from an aerial view" (Art student)

"The time was limited, but outside the classroom, we could also work on it (using SL)…" (Art student)

After thinking about this learning experience in SL, it was interesting to listen to the students, to know about the **opportunities for learning experiences that SL offers**.

Even though answers are oriented from the students´ point of view, it is interesting to describe, their ability to identify the benefits of costs, simulations, ways of saving time, since the very first moment, as Salmon (2009) and Warburton (2009) pointed out.

"I mean, if I'm going to study Painting and take general courses of Design and Sculpture, and I have to make 3D compositions; I'm not going to make a huge composition nor any sculptures; So, it would be a good idea to see how to make a sculpture of that magnitude; it would be good…" (Art student)

"…To visualize bigger things, and let your teachers seeing your creations, it is not necessary to make any enormous sculptures; You can do that in SL; big sculptures if you want, and your teachers can easily see your potential, and everything" (Art student)

"I think it could be a theoretical class, for example, let's say you are working manually, and you don't have enough time to go to classes, you could only get online and have virtual classes, using a microphone; you can listen to the class, take notes,… I think it would be advantageous…" (Art student)

"… It would be cool if there was a person's prototype to play with, taking his muscles out, adding others, those kinds of things… theoretical classes should be given to us through this program; and we were just to have a look of these muscles… We could make persons, with muscles and everything; we could do anything, these models wouldn't get tired (RL); you can rest there, working with models…" (Art student)

From learning points of view, using SL has generated a high motivation and made a discovery, a new tool to permit students improve their productions; it has also achieved the aim of every class: development of a suggested learning style.

d. Using SL as a teaching tool: teacher's point of view

After describing the first participants' impressions while working in SL, learning processes and motivations of teachers when using SL, we can also describe how SL is considered now. According to teachers, it is a teaching tool that offers lots of opportunities, potentials, but also limitations.

As Mas and Marin (2008) mentioned, reevaluation of new teaching methods through SL should be considered; in this case, SL provides teachers with the chance of taking part of reality and modifying it as well; motivating learning in a more effective , experiential and significant way, as the following testimonies mention:

"… As teachers, we can take part and modify realities when changing a focused subject. SL gives you speed of movement because it lets you transmit information very fast." (participant teacher)

"… We teach people to be able to observe things from the floor or the top, students imagine it; you tell them to go upstairs, three floors up on a

ladder, and they do; but in SL you just click and change, that can give you a more direct and experiential learning, you can move in space, do things you cannot do in the real world, not as fast as there; like connecting specific subjects in a syllabus when working with a SL interface; It lets students and teachers look if they are up or down; it is not just imagining that you are looking from a balloon, it's to click the button fly and you are flying, looking from up there; that is the precise tool in the precise moment;… it was effective" (participant teacher)

For teachers, giving a class in SL demands a detailed **planning and preparation** (structure of the class, media, space, materials and time). Even though it is a positive aspect for education, they recognize it could be difficult for new teachers who are not used to plan their classes and resources in detail.

"…Teachers must anticipate different learning stages and be ready to act" (teacher in charge)

"… Everything has to be well structured; in other words, improvisation is not permitted… you can do it flexible, obviously when constructing, in different activities; it is when you can be flexible, but behind that, there is a pedagogical outline, an educational strategy that can flexible according to its own nature;, there is always a structure, a very well established outline" (teacher in charge)

It is important to say that, since this experience, teachers realized that the most profitable part of working with SL is using it within students in a determined context for production, always supported and guided by a teacher.

"If we are already in a SL environment, let's not repeat a present class when being in virtual spaces; in other words, Power Point presentations used in classes and teachers voices are not SL language. SL is to enjoy the environment when doing something even if instructions are received in different ways; if we do not consider it, we are moving backwards; what we want is to move forwards; we move back again if we look for more traditional learning methods in physical classes, don't we?... this is an audio, what I am saying maybe, doesn't appeal to that…" (Participant teacher)

(about the aspects to improve)
"…A person wastes too much time constructing (in SL) benches, small chairs for the students to sit, setting roofs to have a better impression of a classroom, putting images similar to overhead projectors or screens, TV sets and if it's possible, a brand; that's a waste of time…
… There is a big mistake and it is normal, there is no way for learning; people learn within life itself; living in SL, moving in SL; transferring real life into SL does not make any sense, SL has its own language, …
…There is no need of creating roofs, because there is no rain, there is no need of putting chairs because nobody gets tired, your Avatar won't get tired..

Oh! I feel a pain on my leg, I won't be able to work anymore, professor, give me a break please! I am standing and I can't work anymore; …, that will never happen…" (teacher in charge)

"… The environment must be much more dynamic, not much as in real world, but it has to be a really productive place, where a person can use those tools, create objects freely, put squared objects just to measure them… it has to be, more dynamic" (teacher in charge)

It was also found that in order to give classes efficiently, it is necessary to be **tolerant and open minded,** always available to answer any questions. An environment like SL, definitely promotes more freedom to ask, that is something students are not normally used to do in traditional classes.

"… and having a tolerant attitude towards students questions makes them come and ask …There are lots of questions… yes, yes, anyway, at the first moment, it made me feel anxious and at the first impact… I had a line, a torrent full of questions." (teacher in charge)

Regarding **teachers control onto a teaching - learning process**, the teacher in charge observed that dynamic in real classes and in SL are similar (we have students who pay attention, those who talk about different things, those who get easily bored, etc). The teacher found in SL, a tool that leads them to better performances, monitoring and controlling them.

"...what happens in the classroom (present class), also happens in SL and you are more conscious about what is happening, when students talk in SL; it is because they also talk in class, but you don't realize because you don't fly…you don't have the camera that SL has, it is a viewfinder camera, so I am seated on a chair and I know that somebody is talking, even if I am 4 or 5 blocks away, as an example; I can move around the island, students can also do the same, but curiously I get more control over my students' attitude in SL than in RL…" (Teacher in charge)

Some other teachers mentioned that it was difficult for them to control the students inside an environment which permitted such a freedom for speech and behavior. The sensation of lack of control was originated because the students spent their time changing their clothes, or expressing themselves informally in front of everybody, or because the teacher himself did not manage to work with these tools; sometimes there were even visitors on the island who were not registered in the course.

"…There were some students who were so excited with all of this, changing their clothes that you could easily see them all, changing their appearance;
I do believe that they can distract a little, the language itself may bother some persons or maybe not, but we are in a class space…" (Participant teacher)

"…they are not there themselves, the day when we were in a practical class was very complicated, it was not a private space, some people were leaking and not even registered; we didn't know how to recognize them; I had an idea, to create a group of Geometric Drawing and when joining the group, your name could be labelled. We had some hindrances because of those who came to bother; basically, I think order is essential" (participant teacher)

"…As young people, they perform well, and do calmly, I mean using virtual spaces is easy for them, they adapt quickly; but there is something… there is no control… control depends more on the persons… a little scaring because of the ego when you create images and adopt different personalities; you can also face up yourself, doing whatever you want… because everything is allowed there." (participant teacher)

Generally, having a class in SL lets teachers think about their methodology, how they teach and the process of learning itself; Teachers are also to mainly reflect on how to plan an active class where meaningful learning takes place.

e. Interaction and communication in SL

According to Mas and Marin (2008), Grane and Mura (2006) and Iribas (2007) what impacts more is the possibility that these environments offer students and teachers, in order to communicate synchronously and interact in different medias. SL allows interaction and fluent communication among teachers-students, students-students and construction-students.

For the students the possibility of **interacting with their teachers** was one of the most considered aspects, even though they had their own initiative or because teachers were "walking" around these spaces and talk with them; consequently, it was possible to receive some feedback, as some students refer:

"While I was doing my work, I was talking to my teacher on the chat; if I needed something… they were there to support us" (Art student)

"…I remember when they were checking our works, the teachers were walking around and looking at them… and right there, they told us, fix this or that; we didn't have to go to our computers" (Art student)

"..I think it was great because, it… I agreed on how they answered; it was a real environment where you could feel, go and explain them; they cleared up their doubts and trusted you, when giving an additional opinion," (participant teacher)

Individual accompaniment of the teachers support in class, even in RL or SL ones, is crucial and generates a better connection and trust. According to the teachers, it was interesting to identify that, through chats or private conversations, students felt more comfortable to ask questions.

> *"…I felt it happens the same in class, when someone asks if everything is clear, and almost nobody answers… a few people called, "hey! I don't understand, help me, explain me" It was more effective when assisting students individually, one by one and talking to them privately." (Participant teacher)*

Apart from the availability to communicate and use of different strategies, the **rapidity of the teachers' answers** was very appreciated by the students.

> *(regarding the interaction and teacher's answers)*
> *"Answers were immediate, the interaction,… there was no moment when they felt alone, or when nobody could hear you or replied your messages…"(Art student)*

> *"- Well, they always answered…*
> *-And the teacher was on a big screen, I could hear his voice; if you talked about whatever, he answered right then…*
> *- The attention was excellent…" (Art student)*

Other type of interaction was the **communication among pairs**. This interaction was not only developed through oral or written dialogues, but also through the visualization of classmates' works in the environment:

> *(regarding the interaction questions)*
> *".. also with the students because on the other side, there was the other classmate's platform and you could see how he was doing his compositions…" (Art student)*

> *"… you could fly and also see the work of all your classmates from an aerial view." (Art's student)*

In addition to this, it is interesting what the teacher says about how the **interaction can also be observed with the objects developed** in SL.

> *"- …She (the teacher) made a little house with a slide.*
> *- So, the guys went there and effectively played, they climbed it, it was really funny; that is another option to see that what they had created was not just to stay there as a construction, but to interact with, so, it was very valuable for me" (participant teacher)*

Regarding the above mentioned, it's very clear that the use of the SL is a tool which definitely permits an efficient interaction in the Teaching-Learning process because it makes the communication among the teacher and the student easier and shortens the distance among them.

4. Lessons learned

There are many lessons learned after this first experience. The first thing to say is that the learning has taken place in students, teachers and in Avatar PUCP Group members as a consequence of this experience. We can also say that learning has not only been at the level of the conceptual knowledge, but also at the level of skills and actitudes knowledge by using a new tool, exploring new possibilities, new sensations and new approaches to the daily work.

We consider that this experience has let us know about the SL environment from an educational point of view into the teaching-learning processes; and providing the opportunity to learn and understand the use of the new virtual environment.

If we are aware of the mistakes made in the process and the environment potential, it is possible to develop new and more advanced experiences en SL which let learning take place, each time more complex as higher education demands.

We have arranged the lessons learned in the following way: lessons for the teaching-learning process in SL, lessons concerning technological and virtual support and lessons about team of work

<u>Teaching - Learning process</u>

- Features at 3D virtual environments make students become interested and highly motivated to learn and use these tools, in order to learn in a meaningful way.

- The interaction of the students through their avatars encourages teamwork and fosters the development of collaborative strategies in virtual classrooms by the "sense of belonging to a group" that allows to explore and research the "metaverso".

- SL demands new ways of “control” over students, because as any other educational innovation, it implicates “assigns” for students as part of their process of learning.

- The ideal number of students to work in a SL class is 15. If that number is larger, it’s important to count with facilitators or leaders who know the subject and support the teacher.

- It is a good idea to create customized activities so that students can get SL at any time, and reinforce what they learnt individually or in groups.

Technological and virtual support

- It is important to pay relevant attention to technical aspects when working in SL. Computers must obey to specified requirements in order to work properly with determined software, permissions for connectivity, and ports.

- The environment where learning takes place must be dynamic, and permit using different tools and spaces; we must not repeat the structure of common classes; but use all the tools for creation, construction, dynamism, exploration and environment interaction.

- The importance of introductory sessions is huge; giving students longer time to explore SL is necessary. Students should receive two sessions for induction workshops at least, both of them separated by a period of time, in order to let students explore and practice individually.

- Before working in SL, students must explore, play, fly, change appearance and do everything they want, so that they get into classes, more focused on the subject , as Cheal:2007, Salmon:2009 and Grane and Mura:2006 mention.

- It's necessary to have a space (island) for the university in SL, big enough and with all the conditions, necessary to carry out with the university's teaching-learning activities as Grane and Mura (2006) point out.

Teamwork to promote using 3D virtual worlds in Education

- It's important to have a multidisciplinary team which focuses on exploration, development, application and evaluation of using SL in the processes of formation in higher education. Technology is moving forward and possibilities for using it are infinite; that is why universities should actually consider to get better equipments as Grane and Mura (2006) pointed out.

- It is necessary for teachers and academicals authorities to set training sessions for using 3D virtual worlds, in order to remove stereotypes and promote innovation when working with students.

Thanks to this experience, we can confirm that SL is a perfectly useful media in education; that is why it is possible to set a methodology of interactive learning for the exposition and development of learning activities in higher education.

Teachers who participated in this experience managed to satisfactorily work with this tool, what means it can be possible to prepare activities in other courses which could easily apply at SL.

Even though students and teachers are not aware of the potential of this tool, they can see that it is attractive and presents many possibilities; this is already a great boost for all innovating proposals.

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