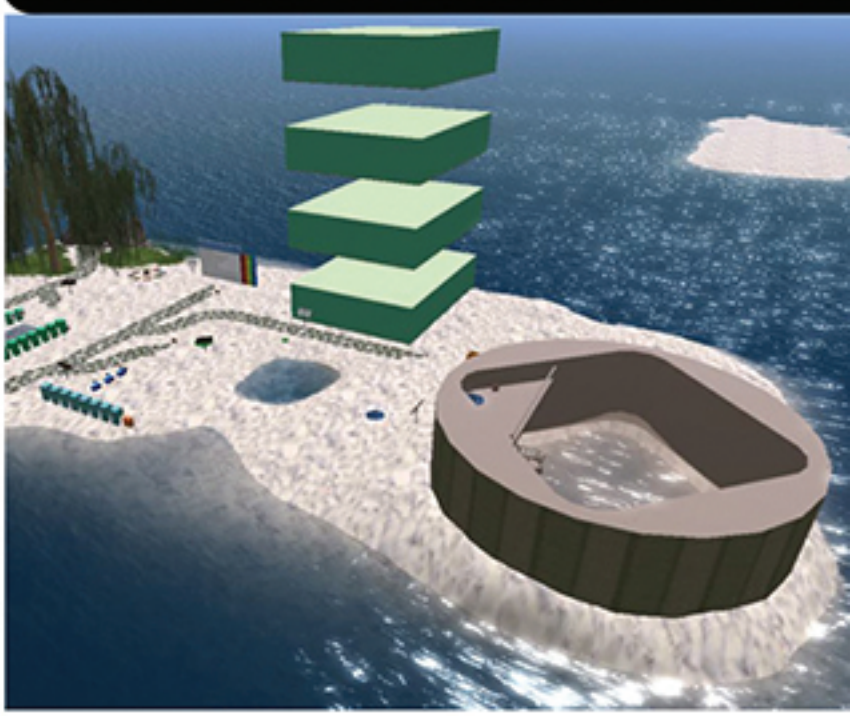
JÁNOS OLLÉ
ZSOLT KRISTÓF

LEARNING, TEACHING AND DEVELOPING IN VIRTUAL EDUCATION

TEACHING · EDUCATION · INFORMATION SOCIETY



ELTE FACULTY OF EDUCATION
AND PSYCHOLOGY

3.

LEARNING, TEACHING AND DEVELOPING IN VIRTUAL EDUCATION

We would like to express our sincere thanks
to Attila Tálos and Balázs Szóda.
Without their help and work we would not
have been able to bring this work to fruition.

LEARNING, TEACHING AND DEVELOPING IN VIRTUAL EDUCATION

János Ollé – Zsolt Kristóf

Budapest, 2013

EÖTVÖS UNIVERSITY PRESS

Education – Information Society

Proofreader: György Molnár

Contributor, Consultant for the English version: Andrea Fischer

ISBN 978 963 312 185 6

www.eotvoskiado.hu

Executive publisher: Dean of the ELTE Faculty of Pedagogy and Psychology
Editor-in-Chief: Dániel Levente Pál
Cover: Ildikó Csele Kmotrik

TABLE OF CONTENTS

I. LEARNING ENVIRONMENTS

1. THE COMPARISON OF OFFLINE, ONLINE AND VIRTUAL LEARNING ENVIRONMENTS

The possibilities of using 3D virtual environments can be more easily described if compared to web-based online contexts or to real-life environments. However, the aim of such comparison is not pure assessment, but rather gaining a better understanding of the characteristics of a virtual environment. Virtual learning environments are not better or worse than the real- or online ones, but they are different. Thus, they might have certain advantages in some situations. An increased awareness of the pros and cons of the different environment can also help us avoid misusing or overusing them without justification. Moreover, one might question the need for virtual environments saying that communication is more personal using online platforms, video conferences if there is no chance to meet face-to-face. In general, it can be said that compared to a 2D online environment, a person's appearance in a 3D virtual space might be considered more personal, as the latter can provide a more unique, life-like appearance. Thus, after some time, using a 3D virtual space might give a lot more personal or intimate feeling than a videocall or a phonecall.

In most cases the virtual environment is more real, life-like and personal than text-based communication online. (Reeves, J. A - Minocha, S. 2011.) Based on Schoeder's findings, Figure 4 below compares the characteristics of virtual and online communication (Schoeder, R. 2011 p. 270).

Environment	Virtual Environment	Videoconferencing	Online Spaces for Gaming and Socializing	Social Networking and Awareness Tools
Appearance	Face with limited expressiveness, body	Head and torso	Avatar	Iconic representation, photo
Environment	Room and larger spaces	Small space within room	World	Spaces consisting of pages and windows
Realism	High	High	Low	Low
Object and environment interaction	High	Very limited	High (but restricted by field of view)	High (but restricted)
Facial Expressiveness	Low	High	Low	Low
Group Size	Small	Small	Large	Large
Communication and Interaction	Synchronous, brief	Synchronous, brief	Synchronous, extensive sessions	Synchronous and asynchronous, constant
Communication modality	Voice	Voice	Text sometimes voice	Text, Sometimes voice
Key Disadvantage	Expense, poor facial expressiveness	Expense, poor audio and bodily cues	Poor facial expressiveness	Lack of social cues
Key advantage	Object interaction	Facial expressiveness	Engaging setting for interaction	Awareness, availability, and self presentation can be managed

Table 1. Comparison of four technologies for 'being there together'

There is no ideal solution, or a best solution when selecting the environment for interpersonal communication or spatial collaboration supported by technologies. A number of factors should be carefully considered when designing a virtual learning environment (Schroeder, R. 2011. p. 272.):

- What kind of appearance is conducive to interacting in situations of online copresence?
- What kind of environment or space, small or large, is appropriate for different copresent encounters and for developing appropriate social norms to govern copresence?
- When is a more realist, and when a more artificially constructed, self-representation conducive to copresence?
- What kind of technological system, with what affordances is suitable for mutual availability and awareness in situations of regular online copresence?
- How should online spaces and worlds be designed to support maintaining awareness of others and signaling availability (or being away), especially across a range of spaces and places?
- What type of engagement, extensive or intensive, video- or virtual mediated communication, is best suited for people to interact and communicate throughout the day?
- How to combine technologies and uses such that they provide the most useful and enjoyable experience of being connected to others in online spaces and worlds?
- What is the upper limit of the number of people who can experience copresence and share a focus of attention in the same space, and when is such an experience and shared focus unnecessary?

2. MULTIUSER VIRTUAL ENVIRONMENTS – THE SECOND LIFE

MUVE stands for Multiuser Virtual Environment, and it is a service to assure access for competing users via the Internet. Advanced three-dimensional graphic and persistency are very typical of it. Users guide avatars which can connect with the world and with each other as well.

Right now, taking many views into consideration, most people use the virtual world of Second Life as a multiuser virtual environment. The reasons for this – without the need to be exhaustive – could be the dynamically changing environment, the relatively simple possibility of the ability to build, and the high number of users. The world of Second Life is in continuous change, because of the interaction between the avatars themselves and the avatars interacting with the environment.

2.1. SECOND LIFE – THE BASICS

Second Life is an Internet-based three-dimentional virtual world, which was developed by Linden Research Inc. with its project leader Philip Rosedale in 1999. Philip Rosedale created the idea of Second Life during the vast event called „Burning Man”.

Second Life opened its gates for visitors on 23rd June 2003., with negligible attendance at first. It built popularity quickly and was the focus of lots of worldwide attention (Hungary included) in 2006 and 2007.

Since then, millions of people have registered from all over the world, and even though an accurate estimation can not be made - because of the multiple avatar characters of some users - according to an assessment from 2011 the number of the active users was around 1 million. Additional avatar characters are called alts. This word is derived from alter ego. Avatars represent the person in the

world of Second Life, these moveable figures are completely able to be shaped, dressed, formed and guided.

Second Life is not a game – even if it appears to be one initially to a newcomer who only knows a small amount about it. In a game there are always purposes and missions, here you can not find any of that. The most accurate name for it is „virtual world", because you can use specific functions and you have possibilities that you do not have in any games.

In Second Life, you can purchase a piece of land for yourself on which you can build freely with the built-in model program. On the land you can build, you can buy houses, or if you have enough experience, you can create stores. In the stores you can sell specific goods like clothes, objects that fit the avatars, flats, and personal belongings. You can create a communal piece of land, or a self-used apartment into which you can even invite your Second Life friends for a virtual cocktail.

Second Life gives an opportunity to chat - both in written and spoken form -, to have fun, to take part in cultural events (eg. concerts, live theater plays, competitions, games). This is why active Second Life users do not like when this world is said to be a game. For most of the users Second Life is more than a game. It is a place to have fun and have a second life, even if it sounds bizarre a little bit.

When you create your Second Life avatar and are still in the browser environment, a username and a password have to be chosen. The username has to be individual. On any site you register to, you should be the only person that is able to log in with your account. There are situations when you have to put money in you avatar's account – even though using the site is free – but there are occasions like buying or renting a piece of land, which cost money. You have to be careful and make sure that your password is hard to find out.

People keep their passwords safe, and for this reason we know very little about the features and stuctures of other people's passwords. It is a fundamental piece of advice not to write your password on anything, so therefore users choose a word that is easy to remember. Password experts say that a password should follow these rules:

– easy to remember
– contains different letters, numbers and other characters
– at least 8-10 characters long
– is often changed
– does not contain rational words or expressions

It is true that these conditions are not easy to fulfill. The hardest part is to remember the password. This is because a completely fictional word containing capital and small letters and other characters as well, and which is 8-10 characters long is not easy to recall.

Because the conditions for a strong password make the password difficult to remember, users often write the password down. Sometimes, they even send it to each other via e-mail or SMS. Obviously if one uses these methods to prevent from forgetting the password, there is a greater danger that hackers or intruders will get the password of the user.

A well-known and simple way to remember the password is to use a certain pre-memorised line to recall them. In this case a line of a famous song, a sentence in a foreign language, a line of a poem or any other well-known line will help to allow one to remember the password. For example, one method is to use the starting letters of the words of the sentence as the password. So when recalling the line, you type the first letter of each word as the password. If you think about it, this password is already secure enough to use, and if you add some numbers or change some letters from capital to

small letters, you will get an excellent password. To make the password even stronger, you can add an exclamation mark, and use the numbers in a diagonal line (3;5;7) from the numeric part of the keyboard. Then the password will be secure enough even for a system administrator with the highest authority possible.

2.2. THE OFFICIAL SECOND LIFE VIEWER – OTHER ALTERNATIVE VIEWERS

Users are able to get to Second Life via a client program - called Viewer, which can be downloaded from the official site of Second Life after filling out a registration form on the site.

Many „Third Party Viewers" or client programs are developed by a third person that can give different functions and designs to the clients which are supported by Linden Lab. This additional functions are integrated into the program by the user's acceptance only. In other words, these additional functions are not built-in optional functions of the official client program. This is understandable, since Linden Lab prefers clients to be developed in their preferred way. In most cases, the Linden Lab clients are actually more user-friendly than the alternate ones.

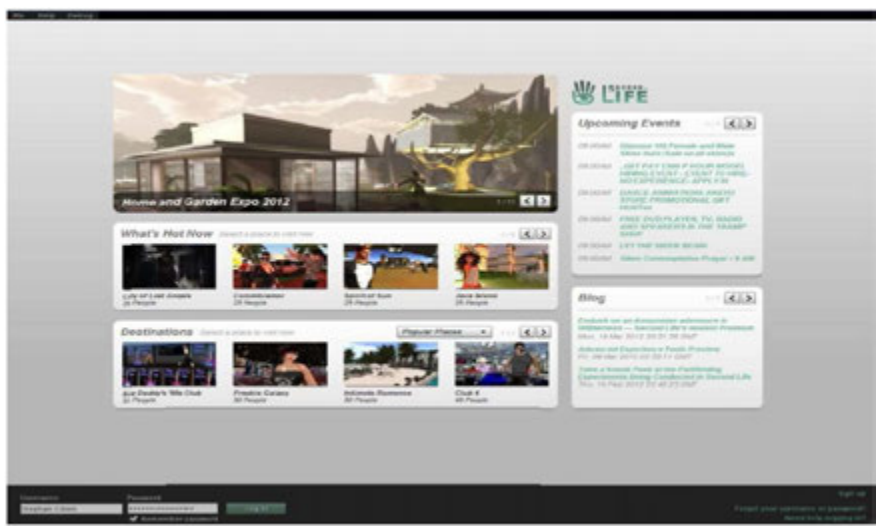


Figure 1. Second Life login screen using the official viewer

It is recommended that you install an officially accepted client on your computer. The status of the client (official vs. unofficial) can be checked at the Third Party Viewer Directory (TPVD) on the Second Life page. Please take note that a new, alternative client which is actually a virus has just appeared recently on the internet. This virus\rogue client steals your Second Life data; your password and your username.

Losing your Second Life character is not a very big problem in itself, except when real money is attached to the avatar. You can change your money to Second Life's official currency: Linden dollar (L$). The process is reversible too; Linden dollars can be changed into official currency such as the US dollar. There is also a premium membership for Second Life, which can give you numerous advantages inside this virtual world.

However, these advantages in the virtual world come at a risk in the real world. To obtain a premium membership, one's bank account number has to be given. If the bank account is broken into, a large amount of money can be transferred from your account to someone elses.

Unfortunately this scenario has occured several times in Second Life, but thankfully the stolen money is always compensated for. If you report the case and explain the situation truthfully, the account gets closed and the stolen money is frozen.

On numerous occasions similar problems have happened and Linden Lab did not offer help. The reason for this was that users did not use the official or TPVD clients. I have to emphasize that the usage of the official or the TPVD clients are essential when using Second Life.

2.3. USERS AND AVATARS, MEETING, COMMUNICATING, AND SOCIALIZING WITH PEOPLE IN SECOND LIFE

The avatars that represent users in Second Life can be completely individual. A dog, other animals, a man, a woman, an old person, a fantasy character, and an extraterrestrial are all possible avatars. Literally almost anything you can imagine can be your avatar in Second Life. Just like people in real life, avatars have different characteristics and features. Leading, shy, and cynical personalities exist in the virtual world too. You can rarely meet two identical avatars, except for the very basic ones that recently-registered people have.

Many users form their avatars out of their own personality. Usually, these users act and look the same way in the Second Life world as they do in the real world. Numerous studies have been conducted to examine this phenomenon. It can be said without exaggeration that avatars in Second Life are not really different from their masters' true character. It may be more beautiful or a little different in a fictional way; but chatting on the internet for a long time and making friends will bring out the true character of the person. After a while you can get to know the real human being. Of course, to reach this point, the other person has to make an effort too.

This could be the reason for the fact that Second Life is free from prejudices. The users do not have to share information (e.g. to post a picture) about their actual life. This way, everyone has the same chances and people are given an opportunity to show their inner characteristics. Sometimes, a user will only ask for another user's real identity after a few months of talking.

There are multiple places in Second Life where people can meet to get to know each other. These are „public" places, clubs, and parks. One can have a written conversation on the common channel, which can be sensed by avatars who are in hearing distance (19 meters). You can open a private channel too, which is called an instant message. Users who want to seriously get to know each other or have been in the system for a long time like to use Voice chat, which requires a microphone. This is

Figure 2. Conversation in virtual environment

a personal way of communication, because one can hear the other person's voice, but maybe this is not really surprising in the 21st century.

Voice chat can be a trap for alts who want to hide (a new character of an old user for example), because you can recognise their voices. To avoid this, they use programs to change their voices.

Avatars can be guided in Second Life, who can move freely in the area. It is also possible for avatars to move through time too, one of the scenes is set in Paris in the 1800s. In Second Life one can even fly, which gives a very nice view of particular places. For example, we can fly up to the top Eiffel Tower instead of using the elevator.

2.4. THE ECONOMY OF SECOND LIFE

The economy of Second Life is very special too, since it has an individual currency and thus, a working economy. As I mentioned before, the official currency is Linden dollar (L$), which can be changed to real money and vice versa.

The economy of Second Life is mostly based on the lands provided by Linden Lab, this means the organisation's main income. The creators are an important part of the business system, who have a private income from the costumers, but it costs money to run the business. This method is good for everyone and keeps money in continuous circulation.

Let's see an example: The user buys Linden dollars from Linden Lab. After that, he buys a pair of shoes from a creator. The creator gets the money, but he has to pay the rent of the store weekly to the owner, or directly to Linden Lab. Almost like in real life.

You can also let out a piece of land or a store for a long time, which is a good investment.

The main thing is that no matter what the issue is, the rent of any land always goes to Linden Lab. The second most important source of income for Linden Lab is the fee of the premium membership; which provides a little piece of ground, presents, and a guaranteed monthly allowance.

The economic system is very interesting, since one also has to calculate the exchange rate of the Linden Dollars that users change back to real money. This special economic system is obviously successful, since Linden Lab has been in business for 9 years.

3. USE OF SPACE, COLLABORATION AND COMMUNICATION

In order to make an informed decision about using virtual environments it is important to be aware of the differences between virtual, online and offline environments. The comparison is started with not the real world, but quite unusually, with the virtual environment.

In a virtual environment one of the focal points of virtual communication, development and research is the avatar, which represents the real person. The person-shaped avatar is unrealistically real, ie. more life-like than an online profile. It enables contact among people who are in a distance from each other, but due to its humanlike (or more unlike) format it is interesting for others present in the virtual environment. Nowadays a 2D online appearance of a real person is not unique but rather a basic expectation. On the contrary, a 3D image is unusual, and as such might provoke a wide range of both positive and negative reactions from the viewers. The majority of users, if the system allows, will shape their virtual appearance and most of them are not indifferent about their look, face or body.

Focus point	virtual environment	online environment	Real, offline environment
person	Unrealistically real, virtual sensation of space in a narcistic way	Between passive invisible and carefully built	Everyday learned roles, habitual behaviour
environment	Formattable to unlimited extent, difficulty with creativity	Underused, multi-faceted	Difficult to change, well-known for users
Space, use of space	Unlimited visualisation, lack of personal space, sensitisation coupled with personal feelings	Based on experiences, usually unplanned, impulsive or completely passive	Habitual, passive
interaction	Experience-based, learned competence, choice of people and environment	Limited and overregulated in closed systems, challenging in open systems	Habitual, usually natural
communication	Learned competence, no metacommunication, ideal with external support	mostly delayed, wasteful time management, generally text-based, rarely multi-chanelled	Habitual, mostly real-time, synchronised communication

Table 2. Comparison of information exchange in offline, online and virtual environments

Having used online networks before or being an experienced social network user helps even beginner users to accept avatar-based communication even though it is very different from the real environment. In these days communication via the internet using computers has been common and widely accepted. Thus, the only unusual feature of the virtual context might be its real time visual effect. Most online users' presence is generally passive, ie. they collect and process information while being invisible, or limiting their appearance on purpose. In a virtual environment, however, appearance becomes not only more active, but also more detailed and structured depending on the user's experience, profession and age. In a virtual environment it is impossible to passively hide by default as it means quitting the process. Hiding is more relevant in offline context when although a user is present with his avatar virtually, but leaves his computer for some time and does not pay attention to what is happening in the virtual context. Although forming avatars tends to become more aware as time passes or according to an agreed role, in some cases experienced users are almost indifferent about their appearance. The users' virtual appearance, their relationship and behaviour towards other virtual users have been in the focus of research and development, perhaps in a slightly exaggerated way.

Disregarding comparison, only few would think that just like an offline, real environment the virtual, online environment is difficult to form, it is also based on habits and users need to adapt to it. We lack certain ergonomical knowledge and the visualisation of creative architectural solutions. As a result, our environment seems to be static and natural, though we could transform or shape it within our physical and financial constraints. However, most people badly tolerate moving houses, and very few would regularly refurbish or reorganize their rooms or flat. It seems irrealistic to change the floorplan according to changing needs, or move the walls in a flat several times. Walls are naturally expected not to be transparent, or sound-proof and roofs or walls would not make average people claustrophobic. In a 3D virtual environment, in contrast, all the above listed possible but unusual solutions to form the environment are absolutely natural. In a flexible virtual system developing the environment is only limited by fantasy, creativity and time. Changing the environment in a virtual world might even become a habit or a favourite passtime as it is neither too time consuming, nor costly.

Changing and developing the online or virtual environments is a special research field where the user's experience is a key factor. In a 2D, online environment the user has got less freedom. Let us consider our limited access to an operational system or a frequently visited website. We might only change anything about the look of the content using the browser, but this option is not commonly chosen. Developers constantly watch users' needs and strive for preparing static, long-term environments. Thus, they not only take into consideration other users' habits but also shape them.

Figure 3. An extract of a virtual environment developed by ELTE IK T@T Lab

Using the space in a virtual environment is substantially different from either the online or the off-line one. An avatar can get to any places in a space, any spots can be viewed from anywhere without changing its position, or changing it in a very limited way. A different spaceview can be hardly noticed by the others. For instance, in a Second Life virtual environment it is possible to look around without changing the avatar's position or moving it. Based on offline experience space is mostly used on the ground surface, but more experienced users might also move vertically. In virtual environments there is usually no personal space, avatars do not move because they get too close to an object or another avatar. At the same time, emotional effects can be noticed in the visual space such as fear of height, or territoriality. Naturally, these feelings emerge in the real person not the avatar if it gets into provoking situations or states.

In offline environments interactions with objects and people are constantly developing learned activities since childhood. In case of a person using a computer we can talk about a naturally formed habit which prevents the user less and less from achieving goals. In online environments interaction is rather limited and generally over-regulated, which is justified by the existing differences regarding access and sharing between the offline and the online environment. In closed online systems, for example in social network sites, the setting and management of access rights and the visibility of information is a frequent problem. In offline environments such rights cannot be controlled at all. On pop-

ular networking sites we can set and limit others' access to our uploaded photos, unlike in offline environments. There we can control who might see us or a real photo of us only by physical movement.

The protection of personal online information is important because in traditional offline contexts it is originally limited by our physical movement in space and time. In theory, anybody can access an uploaded online photo, while only those can see us who are with us in real time and space. Meanwhile, real time moments can also be archived (by a photo taken of others) and then shared in online environments, which cannot be limited or regulated. Overregulation in an online environment is rarely outstanding but rather useful since without such regulated systems we could not find each other.

In a virtual environment interactions with objects and others is experience-based, and just like in the offline environment, it is a learned activity. Due to similarities between virtual and offline environments this learning process is fairly quick as it is based on real life experience. What might cause difficulties, though, is using the technical devices that direct interaction: the computer or the software that enables the connection. In a virtual environment there are partly different rules applied to initiate and respond to interactions, though in a non-game environment the person in active state can decide about it by directing the avatar. In a non-game virtual environment there are no physical needs, fo which interaction is necessary. Our presence is interaction-free, might be totally passive, while virtual habits and culture show an opposite pattern.

From an educational viewpoint, the major difference among virtual, online and offline environments is communication differences. In an offline environment communication is synchronous almost without an exception. It is real time communication with both partners present, and it is a learned activity since birth. It has a habitual order strongly influenced by cultural influence, which is a natural element of everyday life. Due to the spread of the internet, parts of communication is shifted towards solutions supported by technical equipment. The detailed analysis of its positive and negative effects is beyond the scope of this present study. One major difference between offline and virtual communication is that despite all technical options, it is still predominantly text-based. Image-based communication and using symbols are spreading. Although there is every opportunity for using audio-visual connections, most users do not take advantage of them. The majority of online communication is delayed and it is only a minor part which is synchronised. Mostly text-based, asynchronous solutions compared to offline communication are usually less effective, mostly self-directed and self-sufficient.

Most time-wasting solutions could be more effective only if users were more aware of organizing the flow of information in their immediate and more distant environments. Although options for online communication can bridge distances, it does not ensure a solution for differences in time. What is missing mostly from virtual communication is the elements of metacommunication: gestures, facial expressions which are so meaningful in offline environments, posture or mimics.

In different virtual environments some steps have been taken to counterbalance all these to some extent, so an avatar is able to convey the most important feelings if the user gives instructions with the help of the computer. Naturally, it is not spontaneous, but regulated and rather slow to replace metacommunication in real life. One possible communicative strategy for virtual environments seems to be the formation of the avatar, ie. its appearance which carries a message in itself. Communication in a virtual environment is not free from the integration of outside systems and nothing should stop us from using online, or very rarely real world solutions with the help of a suitable computer. Beginners tend to use text-based communication first, which is then replaced by audio-based interactions. One of the aims of using the virtual environment is to bridge physical distances, so it is mostly useless to

combine the repertoire of virtual and offline communication in real time. Although nothing should stop people working in a virtual environment from meeting each other offline, but while all present in a virtual space (except for beginner users' first attempts) there is no additional value of their presence. Communication in a virtual environment is a learned activity, using the equipment is complicated, since physical presence and communication attached to it do not disappear during virtual presence. For instance, while using a virtual environment anybody can come up to us, interrupt us and have a word with us.

4. COMPETENCES IN A VIRTUAL ENVIRONMENT

Possible virtual activities and collaboration patterns are summarized by Andreas Schmeil in Table 10 below. (Schmeil, A. 2012. p. 94.) These basic activities should be considered when designing interaction patterns for avatars among them and with their environments.

Category	Subcategory	Description	Specific examples or applications
Communicative Actions	Verbal	Voice chat, text chat (public and private messages)	Oral presentation, discussion in local chat, private messages, podcasts
	Non-verbal	Gestures, gaze, facial expressions, body posture, avatar appearance	Waving goodbye, sad face, exhausted body pose, white beard
Navigation	Walk	Walking, running, moving sideways	Moving from A to B, walking around an object, getting closer to somebody
	Fly / Swim	Flying in air, floating, swimming/diving	Roaming a floating three dimensional exhibition, diving for a treasure
	Teleport, switching	Switching ('beaming') to another location without moving	Traveling long distances in an instant, bypass difficult terrain or obstacles
Object-Related Actions	Select	Putting objects in personal focus, e.g. for subsequent actions	Refer to objects during a presentation, start modifying an object
	Create /Insert	Creating new objects from scratch or importing objects	Making a chair to sit on, importing a model home created outside the world
	Modify	Transforming, moving, activating, reshaping, re-coloring an object	Making a couch wider, changing the wallpaper in a house, kicking a ball

Table 3. Two-level classification of action and interaction in virtual worlds

When planning an activity or a process in a virtual world it is important to take into consideration the users' previous experience in using the space. Any well-designed activity can turn out to be a failure if the other users' expectation towards interactions cannot be fulfilled.

The organization of virtual projects is usually done by experienced users who rely on their own background and previous experience. However, similar experience cannot be taken for granted with

Figure 4. Virtual space design group activity, practising tasks related to objects

every participant. The activities and interactions mentioned in Table 10 above are difficult for complete beginners and practical implementation might divert their attention from the real process.

If space development was matched to user competences, less attention should be paid to it communication between avatars. In a room designed and furbished for lecturing it would be unnecessary to explain what will happen where, who should do what. In an empty room, however, sitting arrangement, seating the avatars, furbishing the lecture hall takes a lot of time which may give the users a feeling of loss, or discourage them from using the virtual environments.

A well-designed space and the interactive elements placed within can envisage the type of task, its style or type of activity, or even provide information about the number of participants. Furthermore, the complexity of objects can be matched according to the users' experience and competencies. For example, suppose we place a multifunctional chair with a menu that can seat the avatar into different positions based on the time spent sitting while the seating process itself should also be directed by the menu. Although such an over-designed environment may be welcoming for a beginner user, it immediately becomes an unsurpassable obstacle. Kimberly Rufer-Bach in her guidebook on official communication, cooperation and community development also reiterates how essential planning in advance is for virtual space design (Rufer-Bach, K. 2009 p. 35.).

Recommended capability list was made - almost incidentally for avatars in the Second Life virtual space by authors of SLENZ Project with the center in New Zeland in 2008. As the capability list of SLENZ was made in 2008 and since then the Second Life virtual space has been changed and developed seriously several times we felt the need of rethinking of it taking into account the current circumstances (Salt, B., Atkins, C., Blackall, L. 2008.).

I. Necessary abilities for an average Second Life civilian

I.I. Creating an avatar, installation, knowledge needed to enter the virtual world of Second Life

I.I.I. Establishing an avatar

I.I.I.I. The user has to be able to choose an optional, pre-made avatar.
I.I.I.II. The user has to be able to create an individual username.
I.I.I.III. The user has to be able to provide general registration data.
I.I.I.IV. The user has to be able to choose an appropriate password.
I.I.I.V. The user has to know the difference between a premium and a free membership.

I.I.II. The knowledge needed to install the viewer

I.I.II.I. The user has to be able to choose the correct installation for the operating system from the official viewer.
I.I.II.II. The user has to be able to install the viewer into a given folder on his or her computer.
I.I.II.III. The user has to be able to download and install the updates of the official viewers.

I.I.III. Practice managing one of the viewers of Second Life

I.I.III.I. The user has to be able to choose properly from the official viewers of Second Life.
I.I.III.II. The user should take care of the protection of his or her password and personal data.
I.I.III.III. The user has to be able to enter the virtual world according to his or her needs.
I.I.III.IV. If necessary, the user has to be able to change his or her password quickly.

I.I.IV. Having the sufficient knowledge about alternative viewers

I.I.IV.I. The user has to be able to gauge which of the alternative viewers are safe to use.
I.I.IV.II. The user has to know the advantages and disadvantages of using an alternative viewer.
I.I.IV.III. The user has to learn how to manage an alternative viewer if there is a significant difference between it and the official one.

I.II. Having knowledge about navigation and searching

I.II.I. Knowledge about the possibilities of moving the avatars

I.II.I.I. The user has to be able to move the avatar in a given direction by walking or running.
I.II.I.II. The user has to be able to successfully move the avatar in 3 dimensions by flying.
I.II.I.III. The user has to have the proper knowledge about sitting down or sitting on objects.
I.II.I.IV. The user has to know about the teleportation inside and between regions and has to use it properly.

I.II.II. Having knowledge about camera solutions

I.II.II.I. The user has to be able to move the camera up, down, to the right and to the left.
I.II.II.II. The user has to be able to turn the camera around the given focus.
I.II.II.III. The user has to be able to zoom in and out.

I.II.II.IV. The user has to be able to quickly change amongst back view, front view and side view.

I.II.III. Having knowledge about orientation and usage of maps

I.II.III.I. The user has to have orientation skills that make it possible for him or her to map an unknown area quickly.

I.II.III.II. The user has to have orientation skills that allow him or her to move quickly and confidently within a known area.

I.II.III.III. The user has to be able to use the mini map properly, and has to be able to make it smaller or larger.

I.II.III.IV. The user has to be able to use the world map sufficiently, has to understand the marks on it and has to be able to search on the map.

I.II.IV. Having proper knowledge about searching possibilities

I.II.IV.I. The user has to be able to find given places, people, events, groups with the help of the search tools.

I.II.IV.II. The user has to be able to set the correct age group while searching.

I.II.IV.III. The user has to be able create, give and release new landmarks.

I.II.IV.IV. The user has to be able to create a new SLUrl.

I.III. Personalizing the avatars and the user interface

I.III.I. Knowing about Preferences

I.III.I.I. The user has to be able to set the most appropriate language for him- or herself.

I.III.I.II. The user has to apply Away and Logout correctly.

I.III.I.III. The user has to know how to change the visibility of avatar and group names.

I.III.I.IV. The user has to be able to set the graphic parameters according to his or her configuration.

I.III.I.V.The user has to be able to modify the sound settings according to current needs.

I.III.II. Knowing the Profile

I.III.II.I. The user has to be able to create and modify the visual name of the avatar.

I.III.II.II. The user has to be able to set the topics he or she is interested in.

I.III.II.III. The user has to be able to give the languages he or she speaks and the level which the language is spoken at.

I.III.II.IV. The person guiding the avatar has to know how to provide optional personal data, and has to know how to upload a picture.

I.III.III. Knowledge about toolbar buttons and hot keys

I.III.III.I. The user has to be able to choose which of all the toolbar buttons are needed.

I.III.III.II. The user has to know how to reset the original toolbar button settings if needed.

I.III.III.III. The user has to know the hot keys for opening the main, commonly used functions.

I.III.IV. Knowledge about making the avatar individual

I.III.IV.I. If needed, the user has to be able to set the gender of the avatar.
I.III.IV.II. The user has to be able change the basic body features of the avatar.
I.III.IV.III. The user has to be able to change the head and face of the avatar.
I.III.IV.IV. The user has to be able to choose and obtain the clothes of the avatar, even if they are attached or not.
I.III.IV.V. The user has to be able to change certain pieces of clothing so that they fit the avatar the best.

I.III.V. Creating basic objects

I.III.V.I.The user has to know what object can be created in certain areas of Second Life and what tools are needed for it.
I.III.V.II. The user has to be able to create basic forms like a cube, a sphere, a cylinder, a cone etc.
I.III.V.III. The user has to be able to set the permissions properly connected to the created object.
I.III.V.IV. The user has to be able to upload objects.

I.III.VI. Changing basic features of the objects

I.III.VI.I. The user has to be able to name objects.
I.III.VI.II. The user has to be able to share an object with an avatar or with a group of avatars.
I.III.VI.III. The user has to be able to change the size or the location of a given object.
I.III.VI.IV. The user has to be able to place a texture on an object.

I.III.VII. Having sufficient knowledge about Inventory

I.III.VII.I. The user has to know the basic folders and its system.
I.III.VII.II. The user has to be able to create folders and notecards.
I.III.VII.III. The user has to be able to copy or delete objects.
I.III.VII.IV. The user has to be able to create a new inventory panel.
I.III.VII.V. The user can set the organizational possibilities of the objects.
I.III.VII.VI. The user has to be able to search in the inventory based on names, creators and/or description.

I.IV. Knowledge about the usage of social communication tools

I.IV.I. Knowing what 'friend' means in Second Life

I.IV.I.I. The user has to be able to add new friends to the list, or delete avatars from it.
I.IV.I.II. The user has to be able to set whether avatars in his or her friendlist can see the user online.
I.IV.I.III. The user has to be able to set whether avatars in his or her friendlist can locate exactly the current position of the user on the map.
I.IV.I.IV.The user has to be able to set whether avatars in his or her friendlist can modify or delete the user's objects.

I.IV.II. Knowing what 'group' means in Second Life

I.IV.II.I. The user has to be able to join or leave a group.
I.IV.II.II. The user has to be able to create a group.
I.IV.II.III. The user has to be able to create notices and even manage older ones.
I.IV.II.IV. The user has to be able to distribute rights properly inside the group.

I.IV.III. Knowing different possibilities for written communication

I.IV.III.I. The user has to be able to take part in public written conversations.
I.IV.III.II. The user has to be able to start a private written conversation and take part in it.
I.IV.III.III. The user has to be able to use gestures and emoticons while communicating.
I.IV.III.IV. The user has to use shouting in an acceptable and tolerable way.

I.IV.IV. Knowing different possibilities for verbal communication

I.IV.IV.I.The user has to know when and in which areas using verbal communication is recommended.
I.IV.IV.II. The user has to be able to use 'push to talk' and continuous voice connections as well, depending on the situation.
I.IV.IV.III. The user has to be able to change the volume of each avatar.

I.V. Personal security in the virtual space

I.V.I. Knowing about sharing recommended pieces of information

I.V.I.I. The user has to be able to share personal data while communicating with other users.
I.V.I.II. The user has to be able to share personal data while communicating with a group.
I.V.I.III. The user has to be able to place proper data into his or her profile.
I.V.I.IV. The user has to be able to place proper pictures into his or her profile.

I.V.II. Knowledge about the official procedure against attack

I.V.II.I. The user has to be able to decide whether an avatar has a good or a bad intention towards him or her.
I.V.II.II. The user has to know which situations to report to Linden Lab.
I.V.II.III. The user has to know the official steps one needs to take in order to report to Linden Lab.

I.V.III. Knowing the usable methods and techniques against harassment and attack in Second Life

I.V.III.I. The user has to be able to block avatars.
I.V.III.II. The user has to be able to prohibit avatars.
I.V.III.III. If there is a need and possibility for it, the user has to be able to remove avatars temporarily or permanently from certain areas.

I.VI. Having sufficient knowledge about SL etiquette

I.VI.I. Knowing the problems of etiquette in Second Life

I.VI.I.I. The user has to know in which cases he or she should or should not teleport to an area without an invitation.

I.VI.I.II. The user has to know when it is acceptable to start communicating with another, unknown avatar.

I.VI.I.III. The user should not ask about personal information from an avatar that he or she does not know well.

I.VI.I.IV. The user has to take into consideration and understand the special challenges in Second Life coming from a virtual and international environment.

5. FURTHER POSSIBILITIES IN SECOND LIFE

Some readers might be surprised by how many opportunities and programs we have inside this virtual world, and that we can spend time in so many different ways. It is really easy to get deep into the world of Second Life, one's sense of time can become distorted. To oppose this, the clock inside the virtual world of Second Life is set to the time of the headquarters of Second Life, which is San Francisco.

Second Life gives you a variety of cultural programs, work, and things to do for fun that in real life one could not dream of. For example, in Second Life there is the virtual copy of the Zwinger art gallery from Dresden, the centre of Paris and almost all of the big European cities have been virtually copied and imposed into the Second Life world. You can find a copy of the band U2, who organise spectacular concerts all the time. There are numerous different programs, opportunities, and sights which can make up for the missing things in your real life. Besides museums and representative places there are common fields too, where the organisers set up programs, competitions, and games for the visiting avatars. Most new users start here, because here can they meet other avatars who can also help them set things up. Through time it has been shown that the vast majority of newcomers stay as members of these communities.

Having a job in Second Life is very complex, because you can take an individual job like being a creator, or you can take a common job like a host in a club. With work you can earn money (L$), which you can freely use in the virtual world. Alternatively, after you have acquired a certain amount of L$ you can change it to real money.

The great event, Burning Life is organised every year, which pays homage to the founder of Second Life - Philip Rosedale. Philip Rosedale created the idea of Second Life at an event called „Burning Man". Burning Life was the Second Life version of that event, and it was terminated in 2010; probably due to the world's economy crisis. In 2011 it was organised unofficially by private people.

Besides all these, numerous live theaters and virtual plays attract many visitors in Second Life and not without good reason. One thing that attracts many visitors to these performances is the fantastic scenery. The performance-creators take advantage of the virtual possibilities, often making unusually theatric and opulent scenery.

5.1. HEALTH RESEARCH PROJECTS IN THE VIRTUAL WORLD OF SECOND LIFE

In the 3-D environment you can create models of organs and organic systems that can be examined later by students of the health course. One needs to be very experienced and knowledgeable in building in Second Life in order to model organs and organ systems at a complex level. If you want the model to be interactive, you need to create the scripts for it. These things require serious resources. It is very important that the model is very accurate and the way it acts should be exactly the way the real organ does. To be a teacher at a health course one needs the skill to build in the virtual space, and needs to be familiar with the built-in script language of Second Life called LSL, and has to have teaching skills. Obviously one person alone rarely has these skills, so it is recommended to assemble a team of scientists. The big advantage is when the model explained above is successfully built into the educational system, one can replace a real life lesson with a virtual one. I have to emphasize that virtual lessons are not meant to replace lessons taken in person completely. For example, students studying medicine must be able to see and manipulate the actual organs they are learning about - an online lesson won't totally suffice for the real thing. The type of education in virtual space that is explained above will allow departments to reduce the number of organs used in practical lessons. In this way the educational system will save a large amount of money.

Another idea, that was accomplished by a team under Valerie Hall from the University of Brighton, is to create a virtual hospital. A question might emerge here about how and where to use the advantages of a virtual hospital. Even the name of the study answers this question; the name of the project is „Assuring that general medical information is accessible to mentally disabled people in virtual space".

Figure 5. A room of the Brighton based virtual hospital in Second Life

The model of the hospital in virtual space is accurately designed to copy the simple and complex tasks of being in a hospital from patient admission to final reports. This can be a big help for mentally disabled future hospital patients, or adults who have never been to a hospital before (Hall, V. et al. 2011.).

In both virtual and real space reports about one's health are private documents. Even within this group they are considered to be special data, and modification can only be allowed by the proper law or the patient himself. If you want to do research in virtual space, you have to think about rules protecting health data. For the health information systems working in the European Union the following points are recommended to keep:

- It has to be guaranteed that the health and other data of the patient will not be automatically matched and analysed.
- A third person must be authorized to be able to get the data.
- Society has to know about every working data system, and representatives of the society must be able to check it.
- Every person involved has to have the possibility to know the data about themselves and must be able to correct the possible mistakes, even if the processing is manual or automatic.
- The information system and the data collected about the people has to be in order to make health service better.
- Only a health care worker is allowed to change data concerning health.
- Special rules concerning heath data should not be treated as the special edition of general rules, but individual rules that give us special guarantee.
- Techniques used in health care systems must not damage the speed, quality or effectiveness of the health service. If this cannot be carried through, an ideal compromise should be made between safety and economic efficiency.
- In the information system there has to be a way to prove the correct usage of information and to prove the genuineness of the data.
- Access to data has to be matched to pre-defined legal procedures. (Kristóf, Zs. - Bodnár, K. 2008.)

5.2. MEDICAL TRAINING POSSIBILITIES IN SECOND LIFE

Since virtual space allows health workers living far from each other to be in contact, Spanish researchers decided to examine the effectiveness of using Second Life's virtual space as a tool of teaching. They did qualitative research concerning the clinical topics implemented in Second Life, which also contained continuous further training for workers in basic supply. In the real world the centre of the research was Zaragoza, but besides this nine clinics have joined the project.

First of all, to make their work easier scientists recruited facilitators from the health workers. The sixteen representatives of the nine clinics took part in a course for virtual space in two workshops of Second Life, supported by the European Union. After the teaching period was over, they were asked to help with presenting and discussing clinical situations in the virtual space. Citizens of the European Union were free to apply for the actual training. Between 2010 and 2011 76 health workers applied to the accredited further practice training held in the virtual space.

Firstly, applicants had to be trained in their understanding of the basics of the environmental parameters of Second Life. It was quickly realized by the applicants that the course mentioned above was greatly needed, because health care workers were not familiar with Second Life or with the virtual space itself. Besides the course they were given further materials to help in their quick assimilation into the Second Life virtual world.

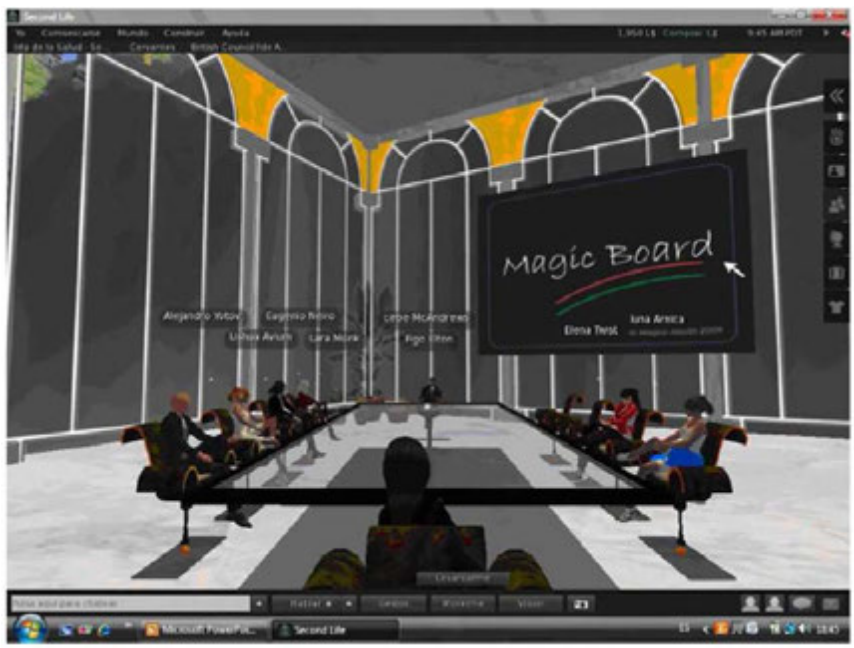


Figure 6. A health care themed presentation in Second Life

At some of the further clinical trainings in Second Life topics like preventative medicine, family, common health care, and preventing drug abuse and other new technologies were spoken about. The lectures were about screening for breast and cervical cancer, the previous vaccinations and contagious infections of immigrants, and monitoring patients who suffer from acute lung oedema or chronic obstructive respiratory distress. They also tried to get people out of the habit of smoking. All training sessions started with a 30 minute long presentation held by a health expert. After this participants had 5 minutes to ask questions, then a discussion which lasted approximately 10 minute started. Every piece of used, helpful electronic material was shared with the participants after the lecture. Although it is true that for sharing they did not use the system of Second Life.

After the lectures and the following events were closed, the researchers asked the participants to fill out a questionnaire. This questionnaire was the basis for the results of the quantitative assessment. The survey was designed to examine the opinion of participants about this form of distance teaching and whether they thought the virtual space of Second Life is an effective way of teaching in connection with health topics.

The answers were given as follows by the nine participating clinics and the 76 health workers (given in percentages):

– Can you picture Second Life as a tool for teaching? 100%
– Does it ease traveling to the place of the course? 74%
– Does it help using the resources of education more? 68%

– Does it help to connect the course material more easily?	47%
– Did you notice any technical problems?	91%
– Did you find the environment impersonal, with too little interaction?	9%
– Did you think it was better that any other distant teaching method?	66%
– Do you think it is better than in-person teaching?	38%

In spite of the fact that the virtual space of Second Life functioned well with teaching, according to the answers of the participants, many of them experienced technical difficulties. However, most of these problems can be fixed with the proper settings. It is very reassuring that the impersonal nature of the virtual world as a negative factor only affected a few people. It is a serious misconception that distance teaching makes learning perfunctory and impersonal. If the method is used in a correct and advanced way, the problem above is insignificant.

It is also quite reassuring that two-thirds of the participants placed the virtual teaching method of Second Life above other distance teaching methods. The fact that only 38% thought that it was better than in-person teaching is perfectly natural. I think that the purpose of the question is not even understandable, since distance courses do not wish to replace in-person teaching completely, but they should rather work together in combination.

All in all, the qualitative assessment led to the conclusion that Second Life is suitable for creating a teaching environment. It was highlighted that by using it the distance between the teacher and the students is surmountable. Here I have to remark that just because of this one advantage it is not worth using Second Life, since reaching this information through an online page could be enough too (Palazón, E. et al. 2012.).

6. INTEGRATED VIRTUAL ENVIRONMENTS

Virtual environments are rarely used on their own, they are generally integrated with other communication systems for a particular project or task. Theoretically, virtual environments are always used together with real environments since while using their avatars the users themselves do not cease to exist in their real world. Virtual environments can also be used while the users are together both in the virtual and the real spaces. Connections via the internet and computers offer access to online environments and applications. With the help of suitable video- and audio technology real- and virtual spaces can be integrated using synchronised timing. Therefore, using different environments should not exclude each other but there is an opportunity to use them at the same time with syncron or asyncron communication.

6.1. REAL WORLD IN A VIRTUAL ENVIRONMENT

Real world environments can appear in virtual spaces in two different ways. On the one hand, objects, textures, arrangement can be digitalised and then constructed in the virtual space. On the other hand, voices, noises can accidentally transfer or pictures, motion pictures or images can be intentionally displayed. Copying the real world into virtual dimensions is dual. It can be lifelike or functional copying. In the first case it is important to copy and display the real world in its original dimensions, while the latter is more about its functional representation: the space, the objects an their functions are displayed (eg. a study, a classroom, a meeting room) without digitalizing and copying the original but constructing and designing a similar virtual one.

Experience collected during copying real spaces or creating virtual spaces based on the real world shows that space development is closely related to the users' background or previous experience or the time spent using virtual environments. It does not mean that more experienced users are more active, or better developers but rather it means that their thinking and beliefs about space change. Their activity in development decreases or it becomes more specialized: copying the real environment becomes less frequent. The avatar's viewpoint is rarely identical with the viewpoint set in the program. We rarely see the virtual world from the avatar's eye-position, perhaps due to lack of peripherical view or other senses. The most frequent view is when it is set slightly above and behind the avatar's head as we move in the virtual space. This viewpoint is also very popular since in this way the user can see his own avatar or at least a part of it. Due to this viewpont the life sized, detailed, texture-based copy of the real environment is likely to create in the user an unpleasant feeling of being locked up. Based on observations avatars are a bit shorter than the users in the real world. The distorted viewpoint and the differences in height do not allow for having a ceiling in an room inside as it would cause problems when trying to move around. When copying real environments, the ceiling can simply be omitted or, if possible, one can distort the measurements and take into consideration the different viewpoint in case of vertical positioning. Rooms without ceilings or buildings without roofs are practical and provide the same feeling as the real world, albeit they might not suit the environment when looking at it from a distance. There is room for creativity and unusual solutions, though when compared to reality such differences might be strange. Based on our experience, one ideal solution may be to lower these rooms, ie. to match their upper borders to the grounds.

Figure 7. shows an empathy training session conducted in a real-sized, texture-like virtual environment copy of Prohaszka Lajos Lecture Hall No. 305 that can be found in the Kazinczy street building of ELTE University, Faculty of Pedagogy and Psychology. It can be seen at the top of the picture that the room has no ceiling. The image on the right hand side is the copy of the real view from the classroom window. The walls and the objects related to the walls are copied, while the equipment in the middle is not.

Figure 7. Virtual classroom copied from the real environment

Beginner users tend to overcrowd virtual spaces in case of making a functional copy, ie. copying it in full when first building a house and furbishing it. However, in a virtual environment it is unnecessary and meaningless as one can have a conversation while floating free in the space, or sit down in an armchair in a carefully designed, colour-schemed living room that reflects the host's style. Awareness of what objects are crucial in an environment develops with experience. Thus, the design of the environment gets more modest but at the same time more practical as well, focusing on those objects that support interaction. Apart from making a static copy of a real environment, the dynamic situation can also be displayed in a virtual environment with the help of suitable technology.

The picture and the voice recorded by a video camera set in the real environment can be transmitted online in a virtual environment using suitable players. Planned and organised transmission of information is relatively rare, while unaware transmission from the real environment might cause troubles. Users moving around in a virtual space with their avatars often apply voice-based connection for communication, the source of which is the real world, ie. the person sitting in front of the computer. While using the virtual environment, there might be unexpected interruptions (other people arrive, the postman rings the bell, the dog is barking, there is no internet due to a blackout, etc.). These background noises or interruptions should be minimized but they cannot be totally filtered. While working in a virtual environment it is important not to keep the mic on, or in order to avoid embarrassing situations we should first let the others know and then quit. In a virtual space more empathy is required in such situations. The unexpected quitting of an avatar or penetrating noises should not interfere with the process but such should rather be considered natural.

6.2. VIRTUAL ENVIRONMENT IN THE PHYSICAL WORLD

Information can be transferred from the virtual environment into the real world just like the other way round. Those equipment we need in order to enter virtual environments are in the real world, they influence our senses, or transmit the information gathered about us. Thus, a virtual environment may appear in the real world in two ways: passively and actively. Developers have long been interested in how to connect to a virtual word. In 2006 David Roberts, Robin Wolff and Oliver Otto carried out an efficiency study in which they connected two users, who were distant from each other, in a common virtual space with the help of technical equipment attached to them. (Roberts, D. - Wolff, R. - Otto, O. 2006. p. 131-150.)

Shared movement and action in a virtual, collaborative world was enabled with the help of digitalisation and transmission. Ralph Schroeder published an outstanding summary of how to use 3D environments for shared activities in which he shows how two distant persons without an own virtual environment can still collaborate (Schroeder, R. 2011. p. 18.). A single direction solution of virtual environments displayed in real spaces happens when a real person directs a distant computer in a way that the user is connected to a virtual copy of that distant world with the help of technical equipment. Such solutions have been utilized for example in the cases of minor medical surgeries. Although the spreading of more expensive technology is still ahead of us, simpler solutions have appeared in game versions and are already available for the wider public (eg. the Kinect systems). Technology can record and model our movement in space and if connected to a network it can be directly displayed in

a shared environment. With these technical equipment available for almost all, we might soon enter a virtual environment from our own room with the help of simple and everyday tools.

The passive representation of a virtual environment in a real space is even more frequent. One possible form is to show the fixed virtual image seen or the voice heard by the avatar from a dynamic point of view in the real space. This is exactly what happens when we connect to the virtual space with the help of the computer as the avatar's viewpoint is being displayed on our screen. Broadcasting from a virtual space is common practice when a part of the space and action is displayed, the voice can be heard in a real environment usually on a passive screen. In our experience even 'observer avatars' could be applied in this case in order to transmit the fixed image picture and voice into the real space. Naturally, digital information can be further shared online, ie. there are no technical obstacles to follow whatever happens in a virtual environment online, in real time.

6.3. INTEGRATING VIRTUAL AND REAL WORLDS

The virtual display of real space can be solved by making an on-going video recording of the real inner space including the actions and show it on a designated screen in a virtual space. From a particular angle real space can be shown as if it was live broadcast in a virtual space. Similarly, showing a set video-recording of the virtual space in a real environment can be carried out. In the latter case the virtual environment appears in the real environment from a particular angle. The two technical sets can also be integrated and both angles may be set in a way to integrate the real and the virtual world. In such a situation cameras and microphones would record the action in the real environment and then transmit them into the virtual space. At the same time, actions happening in the virtual environment are sensed with the help of 'observer avatars' and transmitted into the real world.

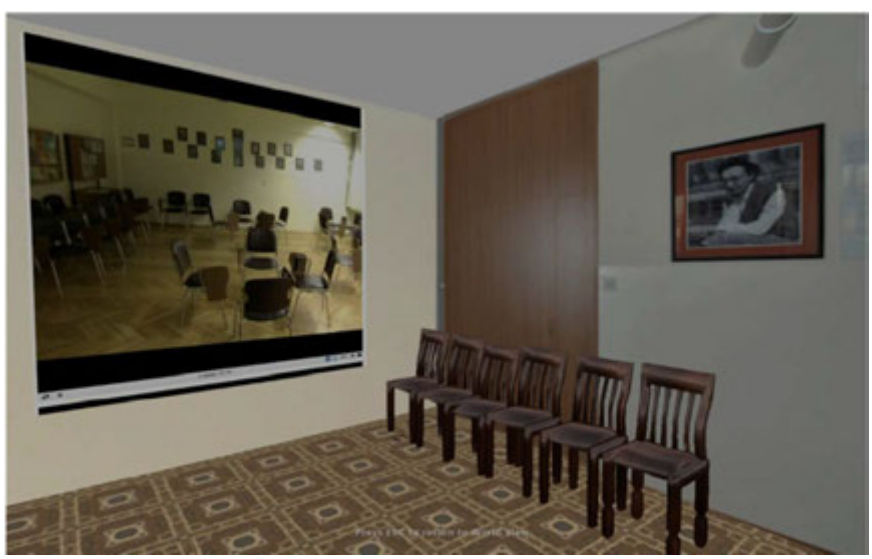


Figure 8. The virtual copy of ELTE Takács Etel lecture hall in Kazinczy street building. On the left the screen shows the live image transmitted from the room.

With the help of suitable screens, cameras and audio technology the integration of the two environments makes it possible to 'peep into' the real world through a wall from inside a virtual environment while we can 'teleport' ourselves into a virtual environment with the help of fan image projected on the wall while in the real world.

Figure 9. The real world ELTE Takács Etel lecture hall in Kazinczy street building. The screen shows the picture from the virtual environment.

While integrating the two environments, the only technical difficulty might be the one or two second delays and difference in time between the simultaneously played video recordings. It might cause problems in case of an activity-based task or project. Furthermore, the sound between the two environments will need to be regulated with the help of an interposed device without which all the sounds

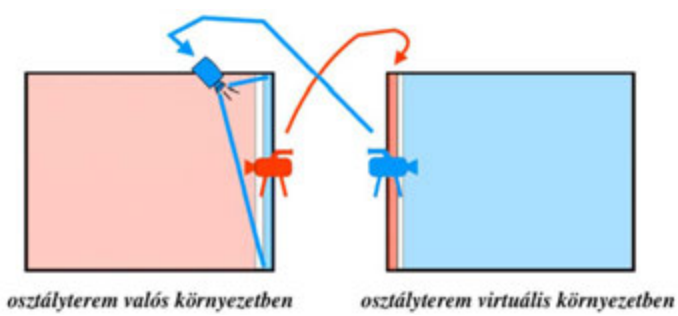


Figure 10. The simplified plan of a video system to integrate virtual and real environments

in the real space are transmitted into the virtual space and with the help of the video connection it arrives back and can be heard again.

A successful research project to integrate the real and virtual environments for educational purposes was carried out by the Information Technology Education- and Research Group at ELTE Faculty of Psychology and Pedagogy. There were four sessions in small groups in April 2012, each lasted for 90 minutes.

The participants were full time and part-time MA Andragogy students, between 10-20 in each session. The lecture given during the sessions was a real one, while the avatar of the lecturer gave a virtual presentation simultaneously. One group had attended a course before and thus had some previous experience on using virtual environments, while the others had no relevant experience at all. Apart from integrating the two environments, the presentations of the sessions together with the live sound was transmitted online, so anybody could have joined the sessions online. Those who attended the real sessions had an opportunity for personal interaction, while in the virtual space there was a chance for interaction with the avatar for those who joined in, or for both at the same time. For online viewers spatial connection was not available, so interaction was ensured through Twitter hashtag as previously agreed. The lecturer could answer and react to both text-based and audio-based questions coming from the real and the virtual environments including the messages on Twitter. The participants were free to choose whether they wanted to join the process online, virtually or personally. An average of two-third of the participants chose personal attendance while only one third of them used the virtual or online option.

Figure 11. The integration of real and virtual environments. The virtual environment can be seen on the left, the real one on the right. The picture shows the view from the virtual environment.

After each session the participants received open-ended questions to evaluate the experience anonymously. All the participants felt that the sessions were successful, interesting and motivating. There was an expressed need for cooperation between the virtual and real, physical environment and felt that there was no sufficient two-way communication, perhaps because of the applied method, ie. the lecture format. Virtual and online participants showed more activity during the session while those present were more active after the session. Those participants, who were present, had no technical devices to share their impressions or questions with the audience. Those who were virtually present

showed more activity via network messages, their twitter messaging showed a surprisingly high rate. Half of the participants mentioned that the unusual integration of the two environments was very distracting at the beginning. Noises were infiltrating through from the real into the virtual space, and unexpected things that happened in the virtual space disturbed those who were personally present in the real environment. When integrating the two environments it was easy to almost mirror the two spaces with transmissions from an almost identical angle, but it was difficult to position the teacher (lecturer) in the real space. At the same time the lecturer had to attend to the numerous technical equipment, keep eye-contact with those present, communicate through the avatar and also appear in the virtual environment. In order to be able to carry out all these tasks at the same time the lecturers failed to find a suitable position in the lecture room. Those four lecturers who took part in the research found it very unusual to manage all the technical equipment in addition to lecturing and communicating through the different channels at the same time. The amount of interaction during the lecture decreased, which thus enabled the lecturers to carry out an unexpected teacherly task. Since it was a new experiment, the teacher turned out to be the only person in the process who had to be present both in the physical, real world and with the avatar in the virtual environment at the same time. This required an unusual amount of division of attention on the teacher's part. Despite all difficulties our experiment proved that with the help of complex technical solutions it is possible to carry out an educational process where participants are present in the real, virtual and online environment.

6.4. VIRTUAL AND ONLINE ENVIRONMENTS

Unlimited options provided by a virtual space might cause problems if we want to replace habitual functions with virtual ones. On entering an optimalised virtual environment or when starting to use it, several functions are not ready to use to ensure communication, collaboration or bridging the distance. Tools can be developed to fulfill the needs of sharing content for example, or the regulation of a set procedure, but it takes time and in most cases requires powerful sources. In most cases it is not worth developing such functions in a virtual space that are also available online. Parallelism should be avoided unless for some reasons participants need to be kept in a virtual environment and should gently be prevented from looking for alternative solutions.

Although the sophistication of online environments does not allow for as much freedom as that of designing virtual ones, practical functions tried and tested by the users can be accessed in their own system based on experience. Virtual environments can be supplemented by online tools and applications in the following ways:

- social network sites (eg. Facebook, Google Plus, LinkedIn): most users are present in these networks, their profiles and portfolios may play an important role in getting to know each other, can also be utilized for organization or publicizing virtual groups or events, in case of technical problems these might serve as reserve platforms for communication. They may be useful for storing, sharing and popularizing video recordings or pictures taken in a virtual environment. LinkedIn groups can present a virtual group of professionals online.
- LCMS systems (eg. Moodle): an ideal system developed for support in education to help processes difficult to direct in virtual environments. Modules set in advance establish the milestones of the microstructure in the process of teaching and can optimalize it. Activity modules developed for connecting Second Life and Moodle (SLOODLE toolset) appear both in online modules and virtual objects linking the two environments.

– blogs and microblogs (eg. Wordpress, Tumblr, Twitter): similar to the relationship between online and virtual environments, these are tools for sharing shorter or longer personal contents. They can be used in parallel with virtual spaces, but there are also objects that support info sharing from the inner world. For instance users can register a separate blog or twitter for their avatars so that their contents which belong there could be separated from other contents. Their major advantage is endurance, logical arrangement and overview.
– content sharing, collaborative platforms (eg. Google Docs, Mediawiki, Delicious): easy to use services for collaborative work (real time editing of a shared document), or mutual systematization or organization of valuable contents produced in a virtual environment. These can be virtually displayed through web browser modules and can also be well used in parallel applications.

SLOODLE (Simulation Linked Object Oriented Dynamic Learning Environment) is, on the one hand, an excellent toolset for the regulation and direction of virtual educational processes. On the other hand, it is a good example for showing what possibilities there are in developing virtual objects and how to connect them with online environments.

Programmed virtual objects can be connected to outside systems through the internet. As a result, online tools can supplement virtual toolsets not only in parallel but also in an integrated way. The names of the elements in the SLOODLE tool system refer to their functions: Choice, Login Zone, Meta Glossary, Password Reset, Picture Glossary, Presenter, PrimDrop, Quiz Pile-on, Registration Booth, Toolbar Giver, Vending machine, Webintercom, Quiz Chair, Tracker. Apart from the process regulating functions of SLOODLE, its activity modules to assist evaluation are also very dominant.

Figure 12. Using SLOODLE in the virtual learning environment of ELTE University, Faculty of Psychology and Pedagogy.

Several experiments prove the effectiveness of using SLOODLE tools. (Livingstone, D. - Peachey, A. – Callaghan, M. – Torotroconis, M. - Hemani, A. - McCusker, K. 2012. pp. 66-71.) As an addition to Moodle, developed for organizing education, a virtual environment can support processes for which an online environment is insufficient. Its special functions can also be useful for a virtual space where practical objects can be developed. (Livingstone, D. - Kemp, J. - Edgar, E. 2008. p. 149.)

Connecting systems is not always unproblematic and might be useful for smaller groups primarily. (Livingstone, D, - Bloomfield, R.P. 2010. pp. 197-198) According to other studies, this solution can be more effectively applied in case of theoretical sessions (Kristóf, Zs. - Végh, L. - Bodnár, K. 2011.) where it provides a motivating and inspiring environment for the participants, which beyond performance, is also a fundamental parameter in the process of education. (Kristóf, Zs. 2012. pp. 106-110.)

6.5. FORMULATION OF A HYBRID ENVIRONMENT

Virtual and online environments can effectively supplement processes that happen in the real world. No matter what purposes we take into consideration, each environment has got its advantages, disadvantages and risks. An ideal solution could be the simultaneous use or integration of the physical, virtual and online environments. We can talk about a hybrid environment when computers in an educational-IT network, online frameworks, web 2.0 tools and social-virtual networks are used together, in an integrated or simultaneous way in the process.

The definition of the hybrid educational environment was originally used to describe online LMS and integrated virtual environments (eg. Annetta, L.A. - Folta, E. - Klesath, M. 2010. p. 153-171.), but nowadays it is not limited to only these two. The combination of these tools and environments have become more widespread due to the increasing popularity of both the technical devices and the online tools. Similar to online platforms, the virtual space is not a distant, difficult to reach and incomprehensible special feature any more, not something that would require lots of technical knowledge. Several research and best practice proves that it can be used not only independently but also combined with other systems.

A basic knowledge of the real, online and virtual environments assures the informed choice when assembling a suitable environment for a project, an educational program, a communicative situation or any other processes. As regards the possible outcomes, we should take into consideration the following factors when planning a process:

– user characteristics (background knowledge, experience, history of learning, competence in using systems, motivation, number of participants, life skills, attitudes to using technical devices etc.),
– technical conditions, access to equipment individually and as a group (quality of computers, power and quality of network connections, mobility),
– available time and staff for planning, development and assessment.

Based on all the above one can make a decision which environment to use when, in combination of which other ones. However, it is wrong to start from a communicative-collaborative environment and not the given project. Using one environment for its own sake may not only jeopardize and undermine the effectiveness of a project but it may also negatively effect the participants' attitudes.

The Information Society Educational Research Group at ELTE University, Faculty of Psychology and Pedagogy carried out a research project on a curricular course where the real, virtual and online environments were used at the same time. During a lecture which was compulsory for both full-time

(N=46) and part-time students (N=44) participants could decide whether they want to take an exam or prepare a practical assignment using the offered hybrid environment. Of the two groups only 36 students chose the practical task. During the course one unit was covered in a weekly 90-min. session, which could be attended or followed online on the internet. The online recording of the lecture remained free to access, so it was possible to view it again at any time. A few days later it was then followed by a virtual seminar held in the evening. Participants were required to prepare for that session by writing blogs, by the shared editing of a document or a presentation or by fulfilling any other individual or group tasks. The working modes at the virtual session were frontal, group- or pairwork, occasionally individual work. Apart from accomplishing individual tasks, the participants were required to cooperate with the others either online and in a virtual environment, or just in a virtual mode. There was an open group set up in an online social network (Facebook) to organize the event where outsiders were also welcome to join. The lecturer was supported by guest lecturers who gave real lectures, or helped the coursework by setting up virtual seminars or practical follow-up tasks. Compared to giving a traditional lecture or a seminar session, this course arrangement meant a huge workload for both the lecturers and the course participants.

Figure 13. University students show their online presentation prepared together during a distance learning course in a virtual environment

The individual elements of a hybrid environment each may have an important role in the process of education. Beyond its organization, the online environment provided independent space and time while interaction ensured effective cooperation beyond synchron virtual communication. During the course the ratio of students who could not fulfill the course expectations was lower (25%) compared

to other experimental courses. Participants were gradually developing their communicative skills and cooperative competences required by the hybrid environment. Several participants stated that their online, public activity was closely followed by their acquaintances and they got positive feedback from them. The work of full-time and part-time students were integrated in this way, the online and virtual environments assured a space-independent platform for education with free access. Our experiment proves that the application of hybrid environments provides an excellent opportunity for development and popularization of open learning.

7. USING VIRTUAL ENVIRONMENTS FOR EDUCATIONAL PURPOSES

Physical distance can be bridged with the help of social-virtual worlds. These worlds formulate an environment for communication where although we cannot be or do not wish to be present, in the physical world at the same location it is still necessary to collaborate effectively. This is the simplest definition describing its advantage for educational purposes. Overcoming the distance in real world can be a unique opportunity but we should also take into consideration the drawbacks of the technical devices necessary. One consequence of a distant relationship is the lack of personal presence. Another disadvantage of using virtual worlds is its technical requirements. In order to use virtual environments for learning purposes one should be a competent user. Process design should be stricter, it often takes longer and thus, should be more comprehensive. In case of beginner participants the virtual world looks more like a video game. Thus, it might be difficult for the users to take a virtual environment seriously, discover its educational role despite the often negative reputation and attitude at the beginning. Constant comparison of the real life image with the virtual world makes it even more difficult.

Taking everything into consideration, we might totally reject the use of virtual environment for educational purposes, as with so many risks and negative features organising such a process seems to be extremely difficult. Considering the application of other technical solutions would also have similar drawbacks, thus drawbacks in themselves are not strong enough claims. If participants are located far away from each other, and moving them together would be more complicated and costly than setting up a virtual environment, then the latter is the solution. In case an online environment is enough for collaboration, and using a 3D environment would not provide extra advantages to achieve the educational aims of the planned program, one should not insist on using a virtual world only because of its novelty. One possible solution is the purposeful integration of different environments, using them alternately in a longer program or in a way to supplement each other. As there are no general arguments or universal rules to be applied regarding the use of virtual environments in educational programs, an individual decision needs to be taken in every single case.

The indicators of effectiveness, implemented sources and performance are often reduced into the time factor. For example, when researching virtual spaces designed for training sessions a special proportionality factor is used to compare the amount of time saved and used in the program. (Cohn, J. 2009. p. 205.). In some situations there would be applicants from different countries or even continents for a special training. In such cases the application of a virtual environment would be the only cost-effective solution. An intercultural, collaborative study group of Asian, European and Arab university students was organized by Béatrice S. Hasler with the aim of increasing their intercultural competence. This experimental course is remarkable for not only its topic, but it is also in line with the

latest trends of global- and open learning. This successful project along with other best practices prove that educational forms without the personal presence of the participants can be used in those areas of education where the aim is not collaborative learning but changing attitudes, increasing empathy or tolerance.

Figure 14. Empathy and tolerance training towards disabled people in wheelchairs in Prohászka Lajos virtual classroom in the Kazinczy street building of ELTE University, Faculty of Psychology and Pedagogy.

The participants were of different opinions as regards communication through the avatars. Some considered it really helpful as they could imagine the others and communication was more comfortable in this way. Others found forming and changing their avatars difficult, so they felt that the basic figure could not reflect their personality towards the others. Apart from forming the outlook of the avatars, the group had mixed feelings about the application of the built-in gestures, which was also an option. Although these might make communication more lifelike, some participants noted that using these functions was overcomplicated, and not surprisingly, the others avoided it too. In case of groupwork, there were similar problems mentioned as in the real world. It was difficult to agree on a time slot and collaborate with active group members etc. (Hasler, S.B. 2011. pp. 265-304.)

Content analysis of using virtual environments for educational purposes shows that application is mostly about simulation (62%) while using it in research and development as an environment for communication is less frequent (23%). Studies mention an even lower proportion of integrated use (9%) of different environments or the experimental use (6%) related to education. The dominant target in formal education is higher education (59%) while, most surprisingly, research and development took place evenly in both secondary and primary education (14% and 15%). The proportion of mutual use (12%) shows that virtual worlds are welcome in open education and reach beyond the frameworks of institutional, formal education (based on Kim, H.S. - Lee, J. - Thomas, K.M. 2012. p. 11. and p. 16.).

7.1. VIRTUAL ENVIRONMENT AS 3D COMMUNICATIVE AND COLLABORATIVE PLATFORM

Virtual environments themselves can be regarded as improved, space-independent systems for communication with the possibility of integration if we ignore the available possibilities for development. The 3D environment appears in the process of passing on information between the participants, surpassing every option of online systems. Platforms for communication and collaboration can be reached with the help of simple computer connections without the virtual world. The options provided by the virtual space is not useful when content-based collaboration can be successfully carried out online. While it is possible to design something collaboratively in the virtual space, writing a text together is more difficult. Thus, in such cases possibilities for development and integration can offer a counterbalance, ie. objects to support such work should be developed or traditional online systems can be utilized.

Figure 15. A Lecture Hall of Virtual Education at ELTE University, Faculty of Psychology and Pedagogy. The ELTE e-learning system can be seen on the left interactive website module, while the homepage of Facebook can be seen on the right.

Collaboration in the virtual space or general content-based work is not ergonomical compared to the constantly developing and more professional services of Web 2.0 applications and social sites. In case of distant work, the virtual space is useful only to ensure collaboration or wanting to be together as much as possible, designing or objectifying something. However, it is less useful for working together on a project where real time presence is not necessary, or not important. Similar to the real world it can be defined who does what, where and when.

The theoretical framework of avatar-based collaboration is best summarized by Andreas Schmeil. Collaboration is based on static, automated and interactive objects along with communicative, navigational and object-oriented behaviour. The aim of avatar-based collaboration can be sharing something, reaching a decision, design and creation of objects for example. Avatars might collaborate with

the aim of learning something, where the common goal is remembering, recalling previous experiences, comparision, application and analysis, synthesis and evaluation. It is possible to collaborate in games in a virtual space with the aim of enjoyment, challenge or socialization.

In the context of institutionalized education an environment that can be formed and made suitable for collaboration may have an important role. Virtual environment can provide exactly those elements missing or causing certain difficulties in the school context of the real world, in a school building or classroom during a project or open education. A school project in a virtual environment is not limited in time and thus can not only reach beyond the confines of a timetable or extra curricular activities, but can also bridge larger time units than a single school year. Furthermore, it can break out of class frames or closed groups which often counterwork projects.

In a virtual environment participants can come from not only from different student groups or classes, but even a local community can join which might otherwise find it difficult to collaborate with the school clientale. Open education is supported by the virtual world through the fact that there are no formal or hidden obstacles in front of those who want to join a project. The anonymity of the avatar combined with constructive intention opens the doors of a virtual public space of a school. Although the artificial and impersonal nature of the virtual space might not allow for everything, but its multilingual and multicultural context creates space for interaction and collaboration that is impossible to establish in a classroom even with the help of online platforms. One example for this might be an environmental project where a class of students in the school models the design of a settlement that uses renewable energy. The participants can not only collaborate with students from another class in the school, but they can have partners from other countries or even continents.

Foreign language communication should not be limited to a simple exchange of letters, or text-based messaging, but can include live talk with the help of avatars that are formed similar to the person using it. Global collaboration becomes truly global and working on a common goal is not text-based or online, but in a virtual world others can be invited to evaluate the project, or even members of a research group can join living on another continent. Compared to online collaboration, the virtual world is more personal, more realistic and as such, it is an excellent framework for the production of content rather than just sharing it in any school projects. Naturally, not every future project is required to be international or it is not compulsory to use only virtual environments during a project week at school. Virtual environments provide opportunities, which one should be aware of and use to its full potentials if necessary during planning a process for learning. Further research of virtual environments might answer the question why there are so few collaborations between all those institutions which are networked almost without an exception, or why local or international collaborations are so limited in number.

7.2. THE VIRTUAL ENVIRONMENT AS AN INTERACTIVE, DEMONSTRATIVE AND SIMULATIONAL PLATFORM

When a new technical solution is introduced in education, most people believe that it should be connected to visualization. However, since the turn of the century we have experienced a broader definition of visualization, as it refers to more than showing distant things in photos, videos or with the help of a live webcam. The internet, online systems and web 2.0 applications have all helped to visualize communities we belong to, or our communication if we and others use the online options they provide to access and share information.

The basic form of visualization in education is to present something, highlight such functions that unexperienced viewers might not notice or might not consider important. In addition, something can be presented from another viewpoint to link it with other concepts to help a better understanding. In these cases visualization is passive, because the participants are only observers. In case of applied visualization there is a possibility of interaction. Tasks are assigned, observation is more regulated, there is regular feedback and finally with the help of analysis and interpretation a well structured summary is given. The effectiveness of visualization can be further improved if the participant is required to take an active role in the task or the process. Learning is more effective if a participant takes part in an action, can get acquainted with objects, concepts or other people in a model situation. There is more emotional involvement and more active participation in a well-directed process than in a situation where we are only outside, passive observers, or become active observers, but unwillingly. Visualization can become definitely more effective if we become part of the visualizational process, activity or behavior itself, and not stay observers, participants or interactive members only. In the real world there are few such examples as it is confined to situational exercises or roleplays which are difficult to integrate with everyday school routine. In a virtual environment, however, there are no such limitations. Our virtual avatar can become active in any visualization, simulation or modelling with the help of object design and free space design. In addition to forming simple demonstrative situations or simulations, a virtual environment can provide for a multi-user, social environment as well. In order to avoid self-contained application, forming a virtual simulation is pointless if it might as well be organised online or in the real world.

The development of virtual environments is time-consuming and requires resources. Therefore, it is more advisable to use it for only those simulations that cannot, or can hardly be executed otherwise.

Several users present at the same time, the free to form avatar-based representation support virtual roleplays (Gardner, M. - Horan, B. 2011. pp. 46-51.), but teaching as a complex activity can also be learnt in a multi-user virtual environment. (cf. Mason, L.L. - Jeon, T.K. - Blair, P. - Glomb. N.K. 2010.). The virtual space can also influence empathy and tolerance. In a training-based virtual best practice the participants through their avatars put themselves into the situation of those who can only move around in wheelchairs, experienced limited movement, vulnerability and the feeling of being different (cf. Szabó, M. - Virányi, A. 2011). There are often heightened expectations towards virtual environments, which can also appear in group activities. Using virtual worlds does not guarantee success, or a virtual training session is not necessarily more effective than a real one. It is important to stress that there has been a very limited amount of research and few results in the field of virtual group sessions and simulations during its short history. Avatar-based virtual presence during training sessions might cause problems since the participants are not there in person, and thus, they appear unidentified for the other participants. Virtual anonymity or impersonality can serve as an advantage and may be the only solution when discussing sensitive issues, or for those, who feel unfit or frustrated in the real world. Virtual trainings provide an interactive, targeted environment for the participants. It is not only about a group of avatars getting together in a virtual space and discussing issues, which they could as well do in a real location. They all become part of the virtual world and in addition to being passive or active observers, the influence is stronger. There are few best practices available for a solution where several avatar-based trainers are present for the sake of a few participants. Although such a solution would require lots of resources, the effectiveness of the trainings organized by them are guaranteed. In the short history of researching virtual collaboration and trainings there is a theoretical framework, background knowledge and best practices available. (cf. Heiphetz, A. - Woodill, G.

2009.). An experiment, where a teacher trainee is teaching in a virtual environment while the avatars of participants are directed by real experts and developers might be interesting for modelling teaching activities. Based on a plan for professional development several situations can be designed to positively influence the trainee's activity in the real world at a later stage. These training sessions take advantage of the communicative chances in a virtual environment and thus become interactive for certain participants.

Another form of virtual worlds ensures the process of planned interactions with the help of an alternative environment changed and developed with objects, and not persons. Tanja Adamus et. al. in their study on the didactical conditions for virtual learning summarize and enlist eleven examples for how to change the virtual environment for effective learning (Adamus, T. - Ojstersek, N. - Nattland, A. - Kerres, M. 2011. pp. 54-77.). There are numerous cases are listed where a virtual environment is shaped for situations and tasks that could hardly be carried out in a real world environment, or could not be executed at all. One good example for an interactive environment is extinguishing fire in the kitchen, or a voting tool, where our standpoint is expressed by moving to a certain place in the space. The latter shows a well-known, real world activity set in a virtual context. Another example is to be the (inter)active parts of a biological cell with the help of our avatars, or to build a learning path in any direction in a virtual space. The creative design of a virtual space with all the element can lead us towards the learning goal while the arrangement, the objects and the artificial textures can be motivating, informative and represent a unique interactive function. Forming the virtual space cannot be compared to a traditional classroom or even to an online platform. The development of virtual spaces, their effectiveness including ergonomy will possibly be in the focus research program in the coming years. The shaping of the environment, the given possibility of global connections and the colourful language environment may prove very useful for language teaching (Shih, Y.C. 2011. pp. 78-94.). The large number of native partners for communication, the interactive environment that can be freely shaped and accessed for any situation or area supplied with online tools suggest application beyond

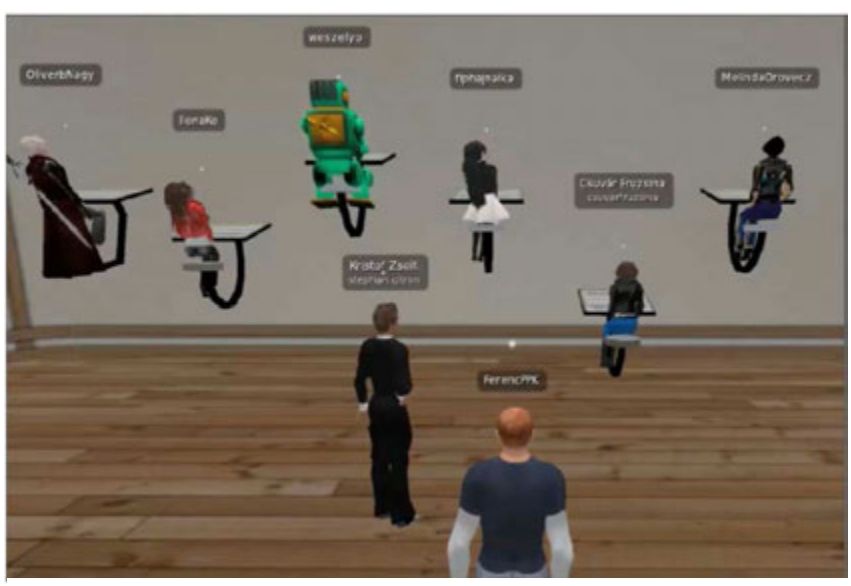


Figure 16. A SLOODLE test module in use in the virtual learning environment of ELTE University. The participants' position in the space is defined by the correct answers they give to the questions.

communication-centred language teaching. Without reliable studies and research results available, there are still many references which suggest that one of the most prosperous business activities is private language teaching in addition to regional development, object development and trade. One example for integrating virtual and online environments is the establishment of a chemistry lab. This complex environment is a well-equipped laboratory that supports experiential learning, can be accessed from any parts of the world and it is available for either collaborative learning or distance education (Lee, W.M.J. - Dalgarno, B. 2011. pp. 138-169.).

Learning environments formulated in an artificial way will obviously not substitute the real world. Instead, they provide opportunities for carrying out tasks that cannot be fulfilled in the real world. Thus, one ideal solution is to integrate the real and the virtual environments. If we go to a real, working farm in the countryside, a virtual classroom set up there would provide us with a space where we could move among the roots of a tree with the avatars, without causing any damage to the real tree.

8. THE PEDAGOGICAL BASIS OF VIRTUAL EDUCATION

The revised version of Bloom's taxonomy has served as a theoretical basis for several other theories. It is still the starting point for numerous studies and professional blogs. The interpretation and reinterpretation, or rather an increasing criticism of Bloom's taxonomy leads to a better understanding of the roles of online environments at different levels in knowledge construction. The digital taxonomy lists the cognitive elements according to the supposed environments: networks, the internet, online communities and web 2.0 applications. (cf. Anderson, W.L. - Krathwohl, R.D. 2001.)

	Bloom's original taxonomy	Bloom's revised taxonomy
	Higher Order Thinking Skills	
	Evaluation	Creating
	Synthesis	Evaluating
	Analysis	Analysing
	Application	Applying
	Comprehension	Understanding
	Knowledge	Remembering
	Lower Order Thinking Skills	

Table 4. Bloom's original and revised taxonomy

The basic elements of Digital Taxonomy, drawing upon the levels can be described as follows (based on Churches, A. 2008.):

– Remembering: retrieving, recalling or recognising knowledge from memory. Students can use digital means to find, record, organise, manage and retrieve the important resources they need. The information located can then be tagged for the community, highlighted and summarized. Typical activities for this aspect are: searching, identifying, naming, locating, describing, listing and recognising.
– Understanding: builds relationships and links knowledge. At this taxonomic level the students should understand the processes and concepts and they are able to explain or describe these. In an online environment activity examples are blogging, categorising, social labelling, preparing comments and annotations. Typical activities for this aspect are: exemplifying, explaining, comparing, classifying, paraphrasing, inferring and summarising.

- Applying: facts and process one had learnt are applied to a situation. Students can prepare products which they upload and then share with others, can use programmes or edit content. Typical activities for this aspect are: exhibiting, showing, implementing, using and executing.
- Analysing: deconstructing collected information, restructuring and organising it in another way, which results in a new meaning or effective explanation. The digital additions are: mashing, linking, reverse engineering and cracking. The key terms for this aspect are: comparing, contrast, organising, deconstructing, attributing, outlining, finding, structuring and integrating.
- Evaluating: making judgements based on criteria and standards through checking and critiquing according to a set of criteria. The digital additions are text-based social media activities, blogs, commenting, reflecting, posting and moderating, The key terms are: observing, testing, validating, judging, critiquing, experimenting, hypothesising and monitoring.
- Creating: it involves all the previous activities to produce a final product. The student collects information, understands & applies knowledge, analyses and evaluates outcomes, results, successes and failures as well as processes to produce a final product. The digital additions are developing, programming, directing and producing, managing the process, creating and finally publishing. Typical activities for this aspect are: designing, constructing, planning, inventing, devising and making.

Minjuan Wang and Myunghee Kang define learning based on the interaction of cognitive, emotive and social factors in their Online Learning Theory (Cybergogy). The students' online engagement and their active participation can only be achieved if the following factors are taken into consideration during the planning and organisational phase of a learning process. (Wang, M. J. – Kang, J. 2006):

- Cognitive factors:
  - prior knowledge, experience
  - achievement goals
  - learning activity
  - cognitive/learning styles

- Emotive factors:
  - feeling of self
  - feeling of community
  - feeling of learning atmosphere
  - feeling of learning process

- Social factors:
  - personal attributes
  - context
  - community
  - communication

In the intersection of the three domains stands engaged, online learning as an opportunity for the online learning environments. Wang's and Kang's theoretical model has become known under the name 'Cybergogy'. So far this theory has influenced several pedagogical models applied for online and virtual environments, including the supplementation of digital taxonomy with the cognitive areas.

The new version of digital taxonomy also takes into consideration the linked learning outcomes when describing the areas of learning

The cognitive sections that refer to the effectiveness of the learning process are supplemented with the categories of feelings, activity and community. The integrated theory as a result is often referred to as the Pedagogy of Social Constructivism (Cybergogy). The table below that summarizes the main elements appear in the literature with some minor differences (Scopes, L. 2009. p. 29. and Scopes, L. 2011. p. 10.):

Levels of implementation	Learning outcomes in Cognitive Domain	Learning outcomes in Affective Domain	Learning outcomes in Dextrous Domain	Learning outcomes in Social Domain
6 (high)	Creating	Managing emotions	Directing	Defining
5	Evaluating	Self- regulating	Naturalising	Networking
4	Analysing	Understanding others	Articulating	Communities
3	Applying	Understanding 'self'	Ddeveloping precision	Communicating
2	Under-standing	Using emotions	Manipulating	Contextualizing
1 (low)	Remembering	Percieving emotions	Imitating	personalizing

Table 5. The summary of Blended Digital Taxonomy

Bloom's revised taxonomy is applied by several researchers for theoretical-pedagogical models for the inside world of virtual environments similar to the online ones. Transferring the model to multi-user virtual environments is rather rare as verbalizing the cognitive, affective and social learning outcomes is independent of the environment while the dextrous domain is generally also true for the virtual space. Melissa Burgess and Phil Ice use the model 'System of Digital Taxonomy' for the practical interpretation of virtual teaching and learning (Burgess, M. L. – Ice, P. 2011. pp. 175-177.). In a virtual space remembering and recalling knowledge is supported by technical tools such as message cards, presentation objects or storage functions for storing the avatar's own objects as well.

In their interpretation understanding is closely linked with research and discovery, ie. the developed inner space and the interactive environments. Social learning through discovery supplemented by outside resources may receive an important role in supporting understanding. In order to apply new skills and knowledge in a virtual environment, the student is required to compare the real- and virtual worlds, apply the information in the other environment no matter where it was created. The virtual world provides unique opportunities for the individual to create objects, reorganise them or objectify information creatively.

Evaluation in the virtual space can take several forms. The learner can collect and create information, the source of which is very often a particular place in the space and not only a reference or a simple object. Events or situations can be created for the learner in order to demonstrate the product of evaluation based on a lower order activity. Whereas at the level of creation, the free design of virtual space and objects can be utilized. The learners can create buildings, objects and events as their own products.

In the theoretical pedagogy of virtual environments the 'Virtual Learning Theory' by Lesley J.M. Scopes blends Bloom's revised digital taxonomy, the system of virtual activities, subtypes of application and the communicative options of Second Life virtual space. Finally, Scopes' model, independent of learning theories, starts with observable activities and defines theoretical activities getting as far as Kapp-O'Driscoll's activity types in an integrated way (based on Scopes, L.J.M. 2009. pp. 41-42.o.).

	Bloom's digital taxonomy - activities	3D virtual activities	Archetype Applications	Second Life communication spectrum
Cybergogy of Learning Archetypes	Designing, Constructing, Planning, Producing, Inventing, Devising, Making, Concretising,	LSL scripting, Machinema Production and Editing, Modeling, Group Management, Event Management, Presenting	Role Play, Assessment & Evaluation, Meshed	Collaborating, Moderating, Negotiating, Debating, Commenting, Group IM, Public Chat, Group Chat, Reviewing, Questioning, Responding, Group Notices Contributing, Voice, Text Chat, Group IM, SLim Interworld IM
	Checking, Hypothesising, Critiquing, Experimenting, Judging, Testing, Detecting, Monitoring	Survey, Contrast, Compare, Measure, Appraise, Rapid Prototype, Rhetoric	Role Play, Assessment & Evaluation, Meshed	
	Comparing, Organizing, Structuring, Deconstructing, Attributing, Outlining, Discovering, Integrating	Inspecting, synthesising, Conceptualizing, Visualising	Role Play, Assessment & Evaluation, Meshed	
	Implementing, Using, Executing, Informing, Disseminating	Rezzing, Materialising, Verbalising, Stating, Proclaiming, Opinionating	Role Play, Assessment & Evaluation, Meshed	
	Interpreting, Summarising, Inferring, Paraphrasing, Classifying, Comparing, Explaining, Exemplifying	Translating, Organising, Re-Organising, Utilising, Appropriating, Owning, Contextualizing,	Role Play, Assessment & Evaluation, Peregrination Meshed	
	Recognising, Listing, Describing, Identifying, Retrieving, Naming, Locating, Finding	Orientating, Saving, Visiting, Revisiting, Referring, Networking	Role Play, Assessment & Evaluation, Peregrination, Meshed	

Table 6. A blended theoretical model of virtual pedagogy (Cybergogy)

Despite its minor definitional uncertainties and its uneven nature in hierarchy, Scopes' model proves to be a suitable theoretical pedagogical framework rooted in digital taxonomy for describing the system of virtual communication and activity. In 'Cybergogy' Kapp and O'Driscoll represent a different theoretical approach which is based on the characteristics of the virtual environment (Kapp, M. K. – O'Driscoll, T. 2010. pp. 71–78.):

– Participant centered (there is the participant in the centre of the learning process and not the teacher directing it);
– Contextually situated (the learning environment is a set of situational context that can be accommodated);
– Discovery Driven (the virtual environment catalyzes action within the learning experience, motivates students, their engagement and curiosity);
– Activity Oriented (episodic activities immerse the participants in the learning experience, interactive content, learning is not separated from activity)

– Consequentially Experienced (learning is based on repeated actions, trial and error and feedback are built into the learning experience);
– Collaboratively Motivated (a "collaborative team sport", participants are incented and rewarded in collaboration, they achieve common goals and co-create action)

The above described learning environment may be considered even ideal for activity-centered pedagogy. Based on the principles, the following four macro-structures are defined by Kapp and O'Driscoll (Kapp, M. K. – O'Driscoll, T. 2010. pp. 78–80.):

– Agency: the ability of the person operating the avatar to take action (primarily depends on a participant-centred environment)
– Exploration: the ability to navigate the environment and examine it to
– gain knowledge (depends on the strength of discovery motivation)
– Experience: the ability to engage in activities, have meaningful interactions, (depends on collaboratively oriented environment);
– Connectedness: the ability to interact with each other to create and build knowledge and understanding. (collaboratively motivated environment driven)

It is perhaps not an exaggeration to claim that the Kapp - O'Driscoll model interprets the virtual space as one that can involve alternative digital pedagogy. The activity-centred, collaboratively oriented environment reveals a very different theory and practice compared to the traditional content-based closed online system. The increasing popularity of open online education, network research, a more aware use of web 2.0 tools and social platforms all lead to the prosperity of activity-based digital pedagogy, which can be anticipated in virtual environments or even considered natural.

In the model the four elements of the macro-structure map out eleven learning archetypes while they also refer back to the seven advantages and values of the virtual environment as mentioned before (summarised and based on Kapp, M.K. – O'Driscoll, T. 2010. pp. 81–82.):

The Elements of the 3DLE Macro-structures	The seven VIE Sensibilities
Agency	Sense of 'self'
Exploration	Sense of Space
	Pervasiveness of Practice
Experience	Enriching experience
Connectedness	Death of distance
	Power of presence
	Capability to Co-create

Table 7. Sensibilities mapped to 3DLE macro-structures

Despite Scopes' integrative theory and the Kapp - O'Driscoll model, virtual environments do not have a culture of pedagogy, a system of pedagogical activities set in advance. Although 3D virtual environments are somewhat limited by technical resources, free space design and the formation of avatars ensure the possible implementation of any pedagogical systems.

The virtual space can also be used for designing a completely passive learning environment, it can become content-based where its function would be limited to the complex communicative space of information gathering. Although the virtual space does not suggest or encourage this rather limited use, or even the first steps taken by beginner users are similar to that, we should not forget the very

strong influence of the traditional teacher- and student-roles and experience, which are rooted in the real world.

The pedagogical culture formed during virtual activities does not mean that using the virtual space for education is similarly unlimited in the physical, offline environment. Any learning process can be designed within the virtual worlds, but these always become parts of the real world processes. An avatar-based action is directed by real persons, so while an avatar is doing something, experiencing and constructing, the real person is learning. There are no obstacles between appearance in the virtual world and its effect in the real world. Thus, Cybergogy is more affected by the participants' learning and teaching experience that come from the real world than by the characteristic features of the virtual world. All users have a learning history without exception, they also have experience that they cannot or in most cases do not wish to ignore despite the unlimited nature of the new environment.

Figure 17. Virtual environments designed for learning. In our research project in 2010 movements and behaviours of the participants were observed.

Virtual environments offer opportunities that are hardly available online, or cannot be created in online environments at all. We should avoid designing an online platform when planning a virtual learning process. A virtual world is underexploited if it is limited to LCMS (Learning Content Management Systems), or if we make a exact copy of a classroom together with its inner design and its traditional learning processes. To illustrate this with the help of periods in the history of pedadogy, we can call cybergogy an alternative pedagogical movement. Therefore, it would be a pity to limit it and return to a former era of content-based, passive learning.

8.1. EDUCATION IN SECOND LIFE

From the moment one starts to use the program it is evident that teaching is a very important part of Second Life. The user has to learn how to manage the client program. Many tutorials were made in order to help, and some were even made by universities in collaboration with one another. The most famous universities represent themselves in Second Life. They mostly have a private field and they create a sandbox (an unrestricted place for building) in order to create a place in Second Life for the first

building attempts of university students. These universities create different scripts in the language of Second Life (LSL script) and tools to make learning easier in Second Life. Sloodle is a system like this.

In Second Life the possibility of learning a language is very important. There are various ways that language learning is reinforced in Second Life. For example, while learning a language one can always go to an English region or field in order to practice the language there.

Besides this, the most widespread form of education teaches people how to build and how to model. Users can take part in courses to learn the model techniques from inside and even from the outside world.

Other things, such as making scripts, textures, animations, positions are taught too, which are also in the category of modeling. Some of the courses cost money, which can be paid for with Linden dollars before the course starts. There is a way to make sure that those who do not pay, cannot take part in the course.

The educational systems of universities often emphasize communication, and students buy and borrow tools to make studying more interesting.

We can remark here that you can make studying more interesting in many ways that you would not use in the real world. These ways are, for example, hiding the material in given areas of Second Life, giving treats after solving a problem, and\or providing a thesis inside Second Life.

Second Life is also noticed by a lot of educational institutions, since they realised that this world has great potential for teaching and learning. There were projects made about astronomy, medicine, music, literature, biology, history, tourism, and languages. Aspects of Second Life educational programs include: Designing objects and placing them in a complex environment, refining them, and free entry into some courses. The richness of the graphics are able to create game-like activities, which transition well into education also.

It is important to note that despite the fact that Second Life assures many great ways of teaching, it is not possible for it to replace the traditional ways of teaching. It is not even a goal of it. But besides realizing this, the fair practice methods of the virtual space should be taken into consideration when teaching in a conservative way. Second Life is suitable for conducting behaviorist, cognitist, constructivist, and even connectivist based excercises. It is difficult and not always efficient to be attached to one kind of teaching paradigm. In many cases you lose more with this than you gain, because while you are trying to use one system only, many opportunities might stay unused (Salt, B. et al. 2008.).

Situative learning – which is based on the field theory of Lewin, and according to it pedagogical happenings just like in magnetics are a vectorial resultant of the forces - tipically has value and contains actual activity (Lewin, K. 1972.). In the real world the effectiveness of this learning method is already proven. Some projects run in the virtual space – because of their shortness and speciality – are harder to prove the effectiveness of in the virtual world. This is another reason why it is important to plan further courses, successful after successful trial.

If one wants to try virtual education, it is important to make exact plans before starting it. It is very important to plan which phase one will do and why one will do it. It is possible that planning in the virtual space requires more care and accuracy to reach a goal than in the classical space with the classical method. An idle state is not tolerated in real or virtual space for a long time, but in the real space we have automatic tricks to avoid these which we sometimes use subconsciously. However, in the virtual world one always has to know what the student is doing, and one has to be sure about where they are in the programming process. To maintain this is a really hard task, so in the virtual space there are often multiple teachers at the same time.

It is unavoidable for both the teacher and the student to be familiar with the world of Second Life. It offers one an attractive, charming, three dimensional environment, where one can quickly learn how to guide an avatar. In the very first minutes – even though the world can seem very unfamiliar – you can have positive feelings. As you spend more and more time in Second Life, you realise the numerous span of activities that you do not know how to carry out. More importantly, at the very beginning both the teacher and the student do not know about the possibilities and the limits of this world. What can we do? What can we not do? If we can do it, how? Although in the virtual space the rules of the teacher and the student often run into each other, or even fade, it is not really a problem if the teacher has more experience in Second Life than the person who is just about to learn about it especially at the very beginning of the work. After that, the curious students will obviously learn a lot and the more familiar the students are with Second Life, the more comprehensive tasks and tools they will be able to use. Based on the things mentioned above we have to note that tutors and students need general training before starting a course.

8.2. EDUCATION PLANNING IN VIRTUAL ENVIRONMENTS – WAITING FOR A BREAKTHROUGH

A good Second Life tutor – after attaining the abilities listed above - cares about the individual learning styles of his or her students. The activity of the student in Second Life is greatly affected by the student's personality and learning style. The learning style differences have to be taken into consideration while the tutor plans the learning methods in the virtual space. Vogel and his coworkers highlighted in their 2008 study that if a student is unfortunately taught to believe that games and studying are incompatible, later, when trying to study in the world of Second Life this method will be strange and not understandable (Vogel, D. et al. 2008.).

An interesting and unavoidable question is: how to plan the already imagined teaching-learning process in Second Life? To start with, one could think about the existing basic principles of online sites concerning studying, but one would make a very big mistake to stop the thinking process here. When planning education in the virtual system, you cannot leave out this system's special possibilities. If you are planning the process, you should lay down the goal of what new skills will the students (probably) have. The second thing is to make the teaching method exactly aligned with the pursuit of reaching this goal. At this point one has to use some of the possibilities of Second Life. This must not be left out because Second Life assures numerous options, and because if one doesn't do it, why does one even use the virtual space to begin with? Why isn't an online site enough? After all these certain forces have to be created, found, formed, and invented. Although, if all these are finished and ready to use, it is recommended to test it with the students, because even if you create the educational method in a very careful and well-thought way, practice can always bring up possible problems (Salt, B. et al. 2008.).

As of now there is no guide that explains how to teach and what tools to use in the world of Second Life. There are no articles, books, and\or parts of books that would write about this in perfect agreement. If you think about it more, maybe it is not even expected to exist yet. On the one hand, teaching in a virtual area is still a very unexplored topic. On the other hand, if you learn enough about the virtual possibilities in Second Life, then a new world opens for you that completely changes the limits of education. In many occasions these limits are so blurred that you cannot even place them. If you are not familiar with the limits, how could you give general advice? Most of the projects run in Second Life were individual. We have been living in the years of exploration for the past few years.

One could ask: why don't we feel the big change then? Why won't more people use the virtual space, like Second Life when teaching? As far as we are concerned, we feel the explanation in the expression „acquire the knowledge". If you want to explore the virtual space alone, and have no experienced team behind your back, your journey can easily turn into a nightmare. You can choose the classic way and read the – still pretty thin edition of - technical literature of Second Life. If you do this, you will be at the level of an IT student who studied programming only in theory. You will maybe have knowledge, but this knowledge alone will be almost completely unusable. This is not even enough to be a SL student, let alone a teacher. The world of Second Life is persistent, we are not in the middle of it. This world lives and develops – from the view of a future teacher - even if you do not log in for days. However, those who want to have a real Second Life tutor state can not allow this to happen. What is more, if one logs in the same way every time (being always in the same time zone and same area, talking to the exact same people after logging in) then they won't be a SL tutor, because they will not be able to become one. If you cannot build and script well, or you cannot use the Second Life Marketplace, even though you are an expert, you won't be able to teach well in the virtual space. We have to mention that probably everyone knows how to build, how to buy at the Marketplace, and how to write script (even if it is at a very basic level). The key word is to do them 'well'. It is not a problem if you cannot do the things listed above at a very high level, the main thing is to realise this and be brave enough to ask for the help of an expert, even if the person is not a colleague or a teacher. If you can build a professional team around you, then you can concentrate on the questions of the study material. So I think that teaching in a virtual space is not popular yet because of two reasons. One of them is that the process is very hard to get through thanks to its need for resources and must be refined through repeated practice. The other reason is that if you do not have the resources listed above, it is almost impossible to get successful results.

9. LEARNING IN VIRTUAL ENVIRONMENT

9.1. LEARNERS AND LEARNING IN A VIRTUAL ENVIRONMENT

The pedagogical models of the virtual environment are so much learning-based and activity-oriented that they may cause difficulties when trying to interpret the student's role and define learning independently. It seems obvious that if the users possess the necessary skills, especially experienced users, will meet the expectations. This is obviously not enough for effective learning, however, supporting learners more efficiently is not yet possible due to the lack of detailed virtual learning methodology.

The available taxonomies of skills are too general, although they are written on the basis of those quoted earlier. As far as the SLENZ list of skills is concerned, it is far not as detailed as either the Scopes' or the Kapp - O'Driscoll model, especially the eleven item list of learning opportunities of the latter (cf. Kapp, M. K. - O'Driscoll, T. 2010. pp. 91-116.). Kenneth Y.T. Lim, in his analysis of avatar activities, describes six broad forms of learning: learning by exploring, learning by collaborating, learning by being, learning by building, learning by championing; and learning by expressing (Lim, K.Y.T. 2011. p. 278.).

It has been agreed that learning activities, as described in the theories of virtual learner roles and learning, are an integral part of general pedagogical models. Apart from the list of expected skills, the

methodology of virtual learning is undeveloped. Learner's awareness, which is in connection with thinking about the avatar, seems to be an independent area for future research. There is an interesting study available of the Schome Park Program project about the dimensions of and changes in learner's role (Twining, P. - Footring, S. 2010. p. 71.):

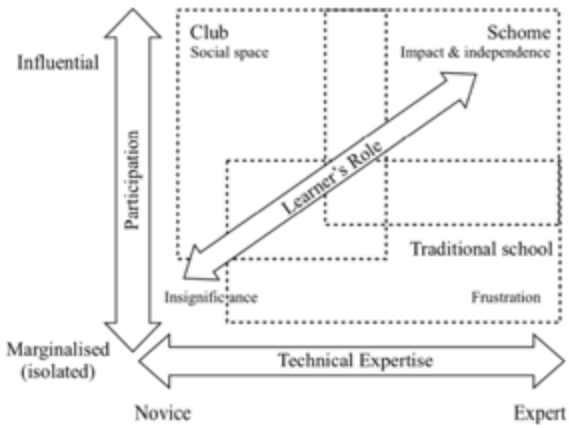


Figure 18. Change in learner role based on their involvement and technical skills

As shown in the fairly simple Figure 18. above, that technical skills coupled with insufficient activity recalls a traditional school environment which is not only frustrating but it proves the lack of technical skills beyond their own needs. A beginner user may become an active member of a group, but for him the virtual space is more like a club. In an ideal case the change in a learner's role follows the path in the middle.

II. Necessary abilities for a common student in Second Life

(It is to be noted, that abilities necessary for Second Life civilians as described in chapter one, are crucial for the effective Second Life student as well.)

III. Knowing the basics about the theory and practice of teaching and studying the virtual field

II.I.I. Carrying out the theory of teaching and studying in Second Life

II.I.I. The student should know what parts of the teaching-studying process are available in the system of the virtual fields.

II.I.I.II. The student has to know the exact goals of the person teaching in the virtual field.

II.I.I.III. The student has to be able to distinguish and understand the differences between studying in the virtual and in the real world.

II.I.II. Knowing the practice of the teaching-studying process in the virtual space

II.I.II.I. The student has to be able to gauge how hard certain things are to carry out in the virtual space and how many resources they use.

II.I.II.II. The student has to know the technical limits of the virtual world.

II.I.II.III. The student has to be able to add extra technics of info-communication to the existing methods.

II.II. Knowing the tools and scripts for helping the teaching-studying process in the virtual space

II.II.I. Knowing the tools for helping the teaching-studying process in the virtual space

II.II.I.I The student has to know how to make virtual teaching and studying more effective by creating basic objects.

II.II.I.II. The student has to be able to quickly attain proficiency in certain specialized teaching tools.

II.II.I.III. The student has to be able to help when someone has a problem with teaching tools.

II.II.I.IV. The student has to be able to recognize if a virtual teaching tool does not work properly because its objects are insufficient. In this case they have to report this to the proper person.

II.II.II. Knowing the scripts for helping the teaching-studying process in the virtual space

II.II.II.I. The student has to be able to set and use the scripts which help the teaching-studying process.

II.II.II.II. The student has to be able to recognize if a virtual teaching tool does not work properly because its scripts are insufficient. In this case they have to report this to the proper person.

II.II.II.III. The student has to be able to give new ideas to create new scripts.

II.III. Transferring abilities between the virtual and the real world

II.III.I. Being able to transfer the abilities obtained in the virtual world to the real world.

II.III.I.I. The student has to be able to transfer the tolerant behavior used in the virtual world into the real world.

II.III.I.II. The student has to be able to transfer the abilities for making a decision, solving problems and being independent to the real world.

II.III.I.III. The student has to be able to transfer the equal treatment of people to the real world.

II.III.II. Being able to transfer the abilities obtained in the real world to the virtual world

II.III.II.I. The student has to be able to transfer the orientation skills used in the real world to the virtual space.

II.III.II.II. The student has to be able to transfer the commonly-used info-communication skills from the real world to the virtual field.

II.III.II.III. The student has to be able to use the language skills in the virtual world that he or she has already obtained in the real world.

II.IV. Communication knowledge in study groups

II.IV.I Knowledge about group communication

II.IV.I.I. The student has to know what ways there are in the virtual world to ask questions.

II.IV.I.II. The student has to know what ways there are in the virtual world to share ideas.

II.IV.I.III. The student has to be able to help other students in answering general questions concerning Second Life.

II.IV.II. Knowing about different communication platforms

II.IV.II.I. The student has to be able to decide which tasks and problems are worth creating a specific group for.

II.IV.II.II. The student has to be able to decide if they should use verbal or written communication while solving a problem.

II.IV.II.III. The student has to be able to choose properly and according to his or her intentions from instant message, public chat or shout.

9.2. LEARNING METHODS IN SECOND LIFE

Kenneth Y T Lim, a researcher at Nanyang University of Singapore, reported about a very interesting theory in 2009. Creating this so-called Six Learnings framework theory required daily thorough research for months. The author worked based on his own experience. He built his teacher, researcher, and syllabus maker into his work. I would like the emphasize that one can only draw a correct conclusion about virtual space if one has spent enough time with actively working in the field. I think this need to have practical experience in order to draw a reasonable conclusion is necessary but not enough in itself. Spending time in Second Life is not worth too much if one cannot even complete the requirements of a Second Life inhabitant, or if one's research is not carefully planned ahead.

Before creating the system, Lim made it clear that you can make one's ideas about learning most efficient if one follows several guidelines of interaction. The guidelines involve the planning of events in the virtual world, and that the participants approach each other with proper respect. In other words, middle and high managers of the school, service and content managers, teachers, and facilitators must work together.

Even in the best-planned education system, the work of excellent teachers can lose effectiveness if smooth access and functioning the virtual world is not assured. Several issues, such as hardware-software problems, bad internet access, and/or the scantiness of some virtual tools can reduce efficiency in the online world. On the other hand, even if one provides the best access to a virtual site – like Second Life – if there is no suitable person to interpret the pre-planned teaching method, or if there is no plan made before, one will not reach the goal either. These organising roles might merge into each other, or – like in my case - one person could be responsible for multiple tasks. Of course this might take even more energy from the organisers or from their resources.

Shortly, the six learning methods are the following:

- explorative learning
- collaborative learning
- self-reflective learning
- creative learning
- learning by championing
- expressive learning. [8]

It is important to clarify that it is unimaginable for all six forms exist at the same time. It is not even recommended to create a program which contains all six forms. It is much more effective if you target one or two methods and use those to work the teaching-learning process out (Lim, K. Y. T. 2009.).

9.3. THE SIX LEARNINGS FRAMEWORK IN A VIRTUAL SPACE

9.3.1. EXPLORATIVE LEARNING

This way of learning is based on exploring the fields. Getting to know many of the scenes can be pre-planned or spontaneous. It is not only a passive interaction with the different areas, but also getting to know numerous audiences in Second Life. Depending on the purpose of learning, these activities might be very different. For example, a student group studying geography in Second Life has to measure – a previously prepared – wind force. After getting the measuring results, based on those numbers they can accept or reject the pre- made hypothesis about weather conditions.

9.3.2. COLLABORATIVE LEARNING

In this learning form students work in teams. The number of people working in teams can even be as low as two, so working in pairs counts as teamwork too. The goals of the teams can be solving certain problems, or sometimes the students have to solve a number of problems connected to each other (Lim, K. Y. T. 2009.). This way of studying can help to improve the meta-cognitive knowledge of participants, and it also improves the adjustment time needed to work efficiently as a team. This type of cooperation and studying in teams embodies a large background of specialized literature. Some of the books are about the advantages of studying together. The book of Johnson and Johnson is very popular, which already had its 5th edition that was published in 1999 (Johnson, D. W. - Johnson, R. 1999.).

Metacognition means metacognitive knowledge in theory and in practice. Metacognitive knowledge is the method to check the ways of thinking, or in another aspect it is the knowledge regarding thought. In his study Flavell made three very different categories. The first one is personal metacognition. This is about how people study and it examines the different ways of studying. For example, some people prefer studying alone, while some prefer studying in groups. The second category is metacognition in connection with the task. This concentrates on how different people are good at different types of tasks. Just think about the difference between the humanities and the sciences. The third category is about the strategy of metacognition, it helps to be familiar with the cognitive and metacognitive strategies (Flavell, J. H. 1979.).

9.3.3. SELF-REFLECTIVE LEARNING

This way of learning is based on the reflection about one's own identity. A similar method of self-reflective learning was written about in Brown and Duguid's article in 2000. They called this method „learning to be" (Brown, J. - Duguid, P. 2000.). This form of studying is unimaginable without the precise and well-researched analysis of identity. In Second Life, involving learning methods that use role-play to study is not rare. The fantasy region called English Village uses a similar concept for studying English as a second language. Another example could be any of the numerous live theater groups in Second Life. These groups sometimes concentrate on certain authors' plays and usually they perform their special interpretation in front of a huge virtual audience. The possibilities of changing the appearances of avatars in Second Life makes the usage of this learning style much easier. This means that in order to use this method correctly, smoothly, and effectively great efforts have to be made when teaching avatar specialization.

9.3.4. CREATIVE LEARNING

This form of studying builds upon the results of students who solve building, object creating, and/or programming problems.

Just like the study plan mentioned above needs avatar specialization, this method has to make students familiar with building in the LSL programming language as well.

If one wants to give a task like this to the students, one has to make sure that they know their way around in math, especially in geometry. Even if it sounds odd or ridiculous, it is also important that the student have some sense of beauty. In universities mostly technical, mathematical, and IT departments focus on this way of learning.

9.3.5. LEARNING BY CHAMPIONING

Learning by championing is used by groups in Second Life who use certain initiations which already exist in real life, or who create completely fictional or even physically- existing ideas. Being accurate and professional is very important in the process of championing. Institutes engaged in working with health like this with this learning method are numerous. An example of an environment like this is Pharmatopia, where one can follow the process of producing medication at a high level of authenticity and expertise.

The championing study form can be a favoured choice for departments of social sciences. Just think about situations when students are asked to organise and create special, audience-moving exhibitions.

9.3.6. EXPRESSIVE LEARNING

Expressive studying is very different in one aspect compared to the five learning forms above. While the first five methods are based on the processes in virtual space, this one projects the activities and their consequences into real space. The reason for doing this is that students who are not in the virtual space can share the experiences too (Flavell, J. H. 1979.).

This way of studying can build upon the idea created by Huan and Cheng in 2008. Their way to interpret self-image in an objective way allows the technique to be helpful when students project their knowledge from the studying process in a cognitive, emotional and social level (Hung, D. W. L. - Chen, D. T. 2008.).

So as a result of the expressive learning students are able to broadcast their impressions and experiences about virtual space in blogs, podcasts, or videos. The process of studying requires that students possess the abilities to write stories, voice and video record and edit, critique at a basic level, and write creatively. This learning method is preferred in departments of media sciences and with language departments.

9.3.7. USABILITY OF THE SIX LEARNINGS FRAMEWORK

The six kind (or as I extended it, eight kinds) learning methods are not only good to use in Second Life, but in any virtual space as well. The effectiveness of the certain types depends on the possibilities of the given virtual space and their correct usage, the tools used, and the willingness to cooperate. As for the future, the eight studying systems altogether might make it easier to understand the difference between virtual environments and virtual worlds. In our own project the students used a seventh and an eighth study form which are developed by us.

9.3.8. FOREIGN DEVICE LEARNING

In this learning method students developed their knowledge through equipments that we found either in the Second Life Marketplace and bought them for Linden dollars or they were free. The equipments which cost money rather complemented the education as a blackboard or chairs. It was a surprise those things were free that were high-value objects, primarily mean the elements of Sloodle's tools.

The main feature of this form that devices can use immediately without manufacturing and programming of things. They work in a relatively large educational space and it depends of us what kind of specific content is uploaded in the objects. Primarily they use for theory-based materials the best. At the same time it may be a problem that although the teacher can set the topic, the punctuality of foreign tools is not perfect. Its efficiency is close to what is expected but it rarely reaches the maximum level. The quiz chair of the tools of Sloodle is a good example for it that was very popular among our students too.

9.3.9. OWN DEVICE LEARNING

When this kind of learning method is discussed we have to clear up that the creators of this course have to make a very strict, widely considered previous work. Objects which were made by us will be necessary because students would achieve this type of learning method by using them.

We have to create our own devices that take part in learning process in the virtual space. First we have to find out which part of the process or material we target with the prepared subject. We have to fix first in theory, that what the object will be capable. After that it is useful to create a realised subject in the virtual space which will contain a program, a script that was created by the makers. We can make scripts in the Second Life with the help of Linden Scripting Language which is the built in script language of the Second Life. The C programming language is a predecessor of the LSL. (Takács, P. - Kristóf, Zs. 2007.). We have to test properly the operation of the object several times.

In my opinion it is perceptible that a great amount of resources consumption are necessary to make this kind of tool. As a teacher we have to be aware of this fact when we chose the learning method.

10. TEACHING IN VIRTUAL ENVIRONMENT

III. Necessary abilities for an average tutor in Second Life

(It is to be noted, that abilities necessary for Second Life civilians as described in chapter one, and that abilities necessary for Second Life students as described in chapter two are crucial for the effective Second Life tutor as well.)

III.I. Knowledge about creating a sufficient area for virtual studying

III.I.I. Creating a sufficient area for studying with good parameters

III.I.I.I. The tutor has to be able to get a proper area for studying which is big enough, and has enough usable prims.

III.I.I.II. The tutor has to be able to manage and use the whole area for studying and use the maximum amount of prims belonging to the area.

III.I.I.III. The tutor has to be able to change the basic geographical settings of the area.

III.I.I.IV. The tutor has to be able to create a 3D study area showing height and depth correctly.

III.I.II. Differences between the students and study groups; knowing about the usage of different study styles and methods in the virtual space

III.I.II.I. The tutor has to properly estimate the maximum amount of people studying in his course.

III.I.II.II. The tutor has to hold introductory lessons at a proper level and number for new students in the virtual space.

III.I.II.III. The tutor has to be able to create the sufficient level and number of tasks for individual, pair work and groups.

III.I.III. Choosing, creating and using scripts and tools properly to help the teaching-studying work in the virtual space

III.I.III.I. The tutor has to be able to properly choose the scripts and tools for studying.

III.I.III.II. The tutor has to be able to create complex objects to help studying in Second Life.

III.I.III.III. The tutor has to be able to create basic scripts to help the teaching-studying work in the virtual space.

III.I.IV. Knowing other researchers' or tutors' successful tasks for the virtual space

III.I.IV.I The tutor has to know of other previous tasks that are similar to his task in features and parameters and are publicized well.

III.I.IV.II. The tutor has to consult often with other people who also use and develop the teaching methods of virtual fields.

III.I.IV.III. The tutor has to be able to take into consideration and build in other researchers' results into his or her own virtual teaching program.

III.II. Knowing the limits of the virtual space

III.II.I. Knowledge about the pedagogical limits in Second Life

III.II.I.I. The tutor has to know the difference between the basic teaching ways and methods used in the virtual and the real world.

III.II.I.II. The tutor has to be prepared for unexpected, odd, or special questions about the virtual world.

III.II.I.III. The tutor has to be able to adapt to situations where the students treat each other and the tutor completely differently from the common way of behaving in the real world.

III.II.II. Knowing the technical limits of the virtual world of Second Life

III.II.II.I. The tutor has to know the surrounding areas of his or her course field and has to know about their topics.

III.II.II.II. The tutor has to know the reboot parameters of his or her course field.

III.II.II.III. The user has to quickly and professionally react to unexpected problems (both in local and distant cases).

III.II.III. Checking and controlling possibilities of the virtual teaching process

III.II.III.I. The tutor has to be able to make sure (frequently, if needed) that his or her students are able to properly use the possibilities and tools of Second Life while studying in it.

III.II.III.II. The tutor has to check frequently whether the tools used for virtual teaching and studying work sufficiently.

III.II.III.III. The tutor has to ask the opinion of the people taking his or her course about the most important parameters of the course.

III.III. Knowing about the communication ways in the virtual field

III.III.I. Knowing the communication tools in the virtual space

III.III.I.I. The tutor has to know all the possible ways of communication in the virtual field.

III.III.I.II. The tutor has to be able to choose the most efficient way of communication in every part of the course.

III.III.I.III. The tutor has to be flexible and competent enough, when communication options inside the virtual space are not available. Outside communication methods are to be offered and used in such cases.

III.III.II. Communication controlling basics and techniques

III.III.II.I. The tutor has to be able to control the written communication between the participants of the teaching-learning process in the virtual space.

III.III.II.II. The tutor has to be able to control the voice communication between the participants of the teaching-learning process in the virtual space.

III.III.II.III. The tutor has to pay attention to the appropriate communication between the students and outside parties in the virtual space. All of this has to be assisted, supported or even corrected.

III.IV. Security and control policies

III.IV.I. Personal avatar security

III.IV.I.I. The tutor must draw attention to the proper protection of access informations.
III.IV.I.II. The tutor must warn the participants, not to accept certain invitations from unknown avatars, only in legitimate occasions.
III.IV.I.III. The tutor must explain health and security risks to the participants of the student group.
III.IV.II. Controlling virtual student groups
III.IV.II.I. The tutor must take care that appropriate language is being used inside the controlled student groups.
III.IV.II.II. On one hand the tutor represents the interests of the student group against other avatars. On the other, the student group's outside communications and expressions are to be kept in hand.
III.IV.II.III. The tutor has to be aware of the tools and possibilities, that are in place in Second Life to be used against possible agressions or offensive behaviors.

10.1. TEACHERS AND TEACHING IN A VIRTUAL ENVIRONMENT

Similar to learner participation, our discussion of the teacher's role and teaching in a virtual environment is confined to those cases, where the teacher meets the learners only, or mostly, in that environment. We shall not discuss here those integrated situations where the teacher is present both in the real and virtual world simultaneously. The list of teacherly skills is very general in this case, so we can observe a transfer of the most general expectations towards teachers into the virtual world. Although we cannot have methodological expectations concerning the list of the teacherly skills, the role of the teacher is definitely more than that of an overall regulator of the process, a supervisor of communication or an information provider for the learners. The virtual appearance of teaching and the teacherly roles could be linked to forming the avatar, or the feelings and thoughts of students towards the avatar could also be researched. It would be useful to work out a guidebook for the implementation of virtual organization of learning and the educational methods rather than listing these features. A theory of virtual teaching could be based on the Kapp - O'Driscoll model, in which a detailed system of activities is described.

During the years of 2010-2012 experimental educational research projects were carried out at ELTE University using virtual environments. The results of these projects concerning teaching and the teacher's role are the following:

– In order to teach in a virtual environment, a teacher needs to manage several information resources at the same time, it is a more complex phenomenon of multitasking which may also be a lot more tiring. Using a virtual environment is a rather exhausting interactive audio-visual pressure, which can only be internalised for two or three hours.
– If there are at least two teacher avatars present, teaching and the teacher's role may be more effective. There would be a need for technical help provided by a technician, someone who has unlimited access in the space and who is not involved in the learning activity.
– Planning in a virtual world should be less detailed than in an online or offline environment. However, the microstructure of the task has to be more defined and several points of branching should be provided. One should also expect facing technical problems. For instance, if a teacher

cannot enter the virtual space temporarily, how would the educational process carry on in his absence?
– Before starting a project it is important to check whether the participants are capable of logging on, or whether their technical skills assure that they can decide to quit in case of problems. Being able to log on is indispensable for collaboration. Sometimes even experienced users may find it technically difficult to establish the connection, which may then cause a considerable delay at the beginning of a process.

The results of best practices and research studies often give suggestions concerning teacher activity. However, in most cases these do not refer to the teacher's role, possible links to real world activities or competences. Very often the teacher appears as a kind of director, in charge of the virtual environment, who is legally or ethically responsible for it. Among the available recommendations on the teacher's role the following guidelines are worth mentioning (based on Talab, R.S. - Botterbusch, H.R. 2010. p. 236. and Talab, R.S. - Botterbusch, H.R. 2011. pp. 188-189., abridged and outlined):

– Be clear about your purpose in using a virtual world for teaching. Ask yourself if what you want your students to learn can be achieved more easily and cheaply in some other format;
– Caution students that, just as in video and computer games, virtual worlds can also become addictive. Tell them to limit their time spent to two-hour intervals. Emphasize that the real world and its people are more important than anyone or anything in a virtual world;
– Caution students that the virtual space is only a collaborative or communication tool and their attention should be directed to the differences between real and virtual worlds without disregarding the practicalities and advantages of the latter;
– Students should sign a release form that they understand that there are both positive and negative aspects of virtual worlds and that they should take responsibility for their acts similar to the real world ;
– Teach students about the SL Community Standards and other legal and ethical issues before leaving the SL classroom;
– Do exercises with students in which they must problem solve about difficult situations, such as being harassed, captured, or griefed, so that they can handle themselves when going into SL alone;
– Teach them how to teleport home or to a safe place should unpleasantness occur.

In addition to taking into consideration all the above guidelines, one should not forget about setting good examples and showing how others achieved success in using the virtual environment and how much happiness this form of learning may result in.

10.2. ORGANIZATION OF LEARNING IN A VIRTUAL ENVIRONMENT

Due to its flexible nature, several different modes and forms of instruction are possible to set up in a virtual environment as well. In addition to different 'best practice' training projects that have been implemented so far, there are public sites and platforms being developed and maintained by a particular educational institution as well. Despite the relatively short history of the virtual educational practice, there is a wide range of organisational and methodological options and solutions present, almost as colourful, diverse and of high quality as in the real world. The virtual educational environment has already been used in several ways: for simulations (mainly the 10-12 year-olds), socio-psychological

experiments, distance education, technical and scientific modelling, organising cooperative training sessions, lectures and several other educational programs based on collaboration. There is an excellent book, edited by Donna Russell, which describes 19 different best educational collaborative practices set in a virtual learning environment (Russell, D. 2010.). The purpose of distance education does not exclude the possibility of using research and development projects to increase effectiveness (cf. Anetta, L.A. - Flota, E. - Klesath, M. 2010. pp. 35-56.). Learning activities in Second Life virtual environments can be traced if visited at secondlife.com/destinations/learning) or the inner search function of the virtual space can be used. Virtual environments are most often interpreted as synchronous tools for communication, though there could be cases where participants are not present together at the same time. When planning a learning process, there are different uses of the virtual environment to be taken into consideration as described in the table below (Gregory, S. 2011. p. 346.):

Synchronous use of the virtual world	Asynchronous use of the virtual world
Guest lecturers	Web quests
Virtual tours and excursions	Receive note cards of activities to undertake tasks by self
Role play exercises	Viewing ''how to'' machinima
Building and scripting lessons	Work on collaborative tasks by self
Collaborative projects	Individual exploration
Round table discussions & tutorials	
Simulations	
Using Second Life tools in groups	
Group explorations	

Table 8. Synchronous and asynchronous uses of the virtual world

Among the different educational contexts, the virtual context is the most suitable for distant learning as it offers an ideal solution for collaboration between persons who are distant in space. In case of its use for distance education, one precondition for effective application is to assure that the participants are competent users of the framework with a fairly high level of self-regulation. Nowadays asynchronous communication is favoured in the practice of distant learning which is also available in virtual environments. However, if we ignore some activity-centred distance learning systems which posess the necessary functions for communication, it is obvious that only virtual environments are suitable for implementing effective synchronous communication in distance education. Virtual environments are also suitable for 'blended' trainings, where one part of the process is based on real contact while the other parts can be delivered using online systems or a virtual environment.

Difficulties might be encountered during the organisation of the educational processes in the virtual world. Problems with the technical background, or even a minor disorder could mean the end of the learning process. There are not any more problems occuring in the virtual world than when using technical equipment in general, but even a minor problem in the former case can cause serious difficulties. Temporary uncertainties should be overcome with the help of available alternative systems for communication between the participants. An open space may pose other unexpected or disturbing factors which should also be accounted for during planning.

The preparation phase of a virtual learning session might be relatively long, depending on the participants' prior experience. However, if the users are more competent and experienced, being it a flexible environment, a virtual project can be launched fairly quickly. An easy-to-access, rich-in-function but modest-looking virtual educational space can be designed within a few hours or can even be rented. If the logistics are given, the launch of an educational program might only be delayed by having to find appointments or working out the program itself. Virtual education does not require a model

that is different from learning in real world, its elements can be applied with some supplements. During the planning phase we should take into consideration the learning aims and objectives, the participants' characteristics (prior knowledge, competencies and attitudes) and the intended content. It should be decided in advance how open the process will be for outsiders, what other online systems or real contact activities shall be used in addition to the virtual space. Planning is assisted by different methodological models but one should also pay attention to the form and system of formative and summative assessment including feedback.

10.3. VIRTUAL INSTRUCTIONAL TEACHING METHODS

Teaching in virtual environments is a hybrid of traditional techniques that are enhanced with the new methods. The theoretical models of this area of instruction are based on participant activity, so most methodological models that describe the teachers' and learners' tasks are basically about learning tasks and activities. One might think about this innovative, motivational and interactive environment that is ideal for learning without the regulation of activities. However, it is not worth using real world methodology as a starting point in a virtual space. Previous teaching experience might be an advantage and could helps regulation but it might be disadvantageous if not based on contemporary pedagogical approaches. In the theory of virtual education several models are present, but there does not exist a priority model or an integrated system. The instructional application of SL is best shown by the fact that even in the user's guide on SL application there are recommended activities and methods (based on Hodge, E. - Collins, S. - Giordano, T. 2011. pp. 225-239. with supplements):

? Basic Presentation and Simple Seating: a space is created that encompasses a basic presentation viewer. The content has been edited on the presentation viewer to contain the textures/slides to be viewed during a presentation that will be related using a standard lecture format So aside from the lecture presentation format, one should include an interactive element to engage the students in the learning process.

– Community of Learners*:* as the instructor, you create a museum filled with presentation viewers or even frame objects that allow students to upload their designs (textures). You hold a synchronous class session where, as a group, you walk through the museum to view and discuss the different designs.

– Simulation: provides an environment that encourages interaction and socialization. SL provides a dynamic environment in which students can interact and engage in the process.

– Special Events: organizing an event in SL is exciting, but at the same time it requires you to address a variety of elements to ensure that your event runs seamlessly An event could be an exhibition, conference, round-table talk or a game played with inner objects.

– Invitation of Guest Speakers: you may be trying to provide your students with the opportunity to interact and network with an "expert" in the field. It is important to limit the event in time to ensure interaction between the guest and the group, or within the group.

– Building: the creation of objects based on real objects according to virtual needs. Designing, and formation as a continuous activity belong here. Objects can be directly related to instruction or a

particular task. The development of objects is not self-centred if it later receives a function or the objects are used for other projects.

– Exploration and Research*:* can be conducted on any topic in SL. Depending upon the discipline you teach, it is easy to develop a project that includes students exploring and interacting with other residents and the exploration activity is that the students can create a survey to be completed or even a scavenger hunt.

The most influential methodology in the pedagogy of virtual environments is by Karl M. Kapp and Tony O'Driscoll. Methods are more the basic types of virtual activities. They are mostly student- and teacher activities described and summarized either as a new method or organisational solution. What follows is a summary of these basic activities supplemented and illustrated with methodological features (based on Kapp, K.M. - O'Driscoll, T. 2010. pp. 91-116., supplemented):

1. Avatar Persona. Ability of people to act and observe themselves acting within the environment as an avatar. Acting and navigating within the virtual world as the avatar, which ensures movement and communication. Therefore, the avatar persona is a large part of the learning experience in a simulation.

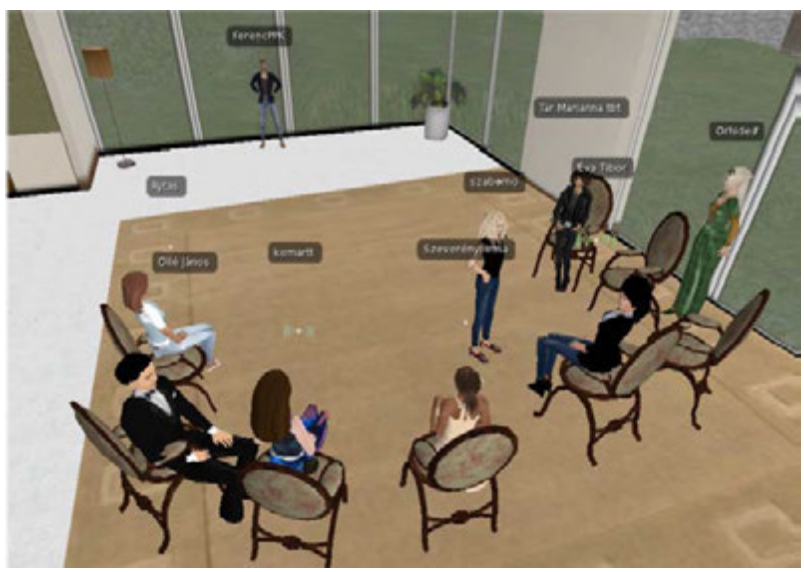


Figure 19. An avatar-based group session at ELTE Virtual Environment

2. Roleplay. To assume a role in an alternative form (living or inanimate) with the objective of understanding aspects of action and interaction to learn how to perform that role or gain a better understanding of the person typically serving within that role. It is often used for language teaching both in virtual and real environments. The effect of a realistic-like avatar can be influential. The role-play avatar is a method to form and implement a role in an interactive environment.

3. Scavenger Hunt. The interaction of individuals or groups in either freeform or prescribed environments with the intent of developing knowledge based or simple inanimate or pre - programmed interaction with the environment. In this case questions set in advance will help carrying out learning tasks.

4. Guided Tour. A guided tour is a formalized, escorted situation based on constructs designed to facilitate interaction of individuals or groups with various environments. These tours take learners to areas of pertinent or general interest while the tour guide/device speaks with authority on the subject matter. The guide is not a real-time avatar, but the environment is prepared in a way that it would provide information for the other users. These tours take place in a pre-prepared context which might regulate the participants' process of getting to know each other or their activity.

Figure 20. A virtual group-tour at NASA

5. Operational Application. Interaction and manipulation of objects for the purpose of gaining proficiency in functionality and performance. The key to this archetype is that the learners are challenged to apply physical world rules to objects in the virtual environment without any risk. To develop and design such an environment could be a project. In the former we might get to know a farm or a machine within, while in the latter this environment is designed in a more complex project task.

6. Conceptual Orienteering. Activities or situations in which learners are presented with examples and non - examples of environmental or situational conditions for the purpose of discrimination and creating an understanding of key concepts. In a broader sense it can include observation during the operation of environments in action. Examples and counterexamples provide for exact definitions and a system of definitions.

7. Critical Incident. Plan for, react to, or conduct activities that are unexpected, infrequent, or considered to be dangerous when practised in the real world, The participating avatars are in a similar situation to the real world where they have to react, solve a situation, change their position combined with the necessary action. A special training-type variation of role-play. The virtual environment experienced is not dangerous but life-like simulation can create and form personal feelings. Thus, a virtual solution can easily appear in the real, physical world.

8. Co – Creation. Not to be mixed up with collaboration. Social facilitation enabling two or more individuals to work together with a goal of contributing to the formation of something new. The aim is not to create a shared environment where it is not only cognitively instructional but also those indispensable social competences can be developed that are also needed for the real world.

Figure 21. Common practice of designing objects.

9. Small Group Work. The congregation (by design) of small numbers of participants into one cohesive group for the purpose of sharing, contributing to the body of knowledge, or presenting or soliciting formation. The virtual space is a common study that can be the copy of the real environment. The interactive objects need to be designed to support inner communication so the participants would not need alternative systems. Several methods can be taken from the real world and applied to learning content.

Figure 22. Shared editing of a mind-map in a virtual environment with the browser that shows the webpage

10. Group Forums**.** The congregation (by design) of large numbers of participants into one cohesive group for the purpose of sharing, contributing to the body of knowledge, or presenting or soliciting information. Interactivity is within group ensured by objects placed in the space. This format is used for virtual conferences. Space-independence is utilized to surpass real –life organization with the option of organising global virtual conferences.

Figure 23. Feedback on shared activity after a group session

11. Social Networking**.** Creation of time and space to allow participants within an environment to connect with one another on an informal basis for the purpose of sharing knowledge and information and creating new knowledge and information where synchronous communication is not expected. Groups get formed on the basis of similar needs. Events can be organized. Most social network sites work just like online groups with the exception of a few where the appearance, 3D interaction and the environment can all be formed more easily.

The fast development of best practices in virtual environments has not been coupled with the invention of coherent, well-established theoretical-pedagogical models yet. Some methods are formed on the basis of teacher and learner activities transferred from the real world, while other good solutions are based on direct practical experience. The methods, planning, organization and the basic learning modes are all somewhat intertwined and thus blurred in the virtual space. It might not necessarily be a problem since the relatively short history of virtual education dates back only a few years. As far as methodological development is concerned, it will be interesting to see which methods will become dominant in the long run: the ones transferred from the real world, or those that also apply the characteristic features of the virtual context. This comparison is not only a question of methodology and it does not mean a single way transfer from the real into the virtual space, since in the future nothing should stop us from trying out those virtual best practices even in the real world.

11. LEARNING IN VIRTUAL ENVIRONMENT USING THE SLOODLE TOOLS

11.1. BIRTH OF SLOODLE

When a layperson hears the word „Sloodle", he or she probably won't know what that is. This word is not new in sciences, but technical terms are not expected to be used commonly in everyday life. It is hard even for professors, experts, and IT researchers to form a correct and proper opinion about it, because of the simple fact that not many people have met with it in their practice or have read about it before.

On many occasions it is hard to tell who was the very first creator of an idea or when it was created exactly. Fortunately this is not the case with Sloodle, David Livingstone and Jeremy Kemp's short, only 6 page article started the improvement of this tool which lasts until today. While they carried out this project—being in different continents was not an obstacle. Livingstone was, and still is working at the West Scottish University, while Kemp's base is San Jose State University. They are still working together to improve Sloodle. The article was mainly about how one can coordinate the virtual world with various studying methods. More accurately, they wrote about the connection of Moodle and the virtual world of Second Life. A serious, detailed and well-established study helped in their work, and as a result of that, the first and very basic form of Sloodle was created (Livingstone, D. - Kemp, J. 2006.).

The official, 1.0 version of Sloodle came out in August 2009, after the Eduserv Foundation helped with its creation for 27 months. The help was going to last for a year originally, but because of the great progression time and the promising results, it was lengthened by a year. After the second year they realised that reaching completeness needed another three months. This was no problem, since Sloodle 1.0 only needed few, but essential changes back then.

11.2. WHAT IS SLOODLE?

Sloodle is a software package which connects the web-based (quasi-virtual study) environment of Moodle with the three-dimensional virtual world of Second Life. We use the term „quasi-virtual" for tools which provide an electronic, PC supported, and/or maybe even an internet based environment. The downsides is that these would need improvement in flexibility, interactivity, and in being user-friendly. They also cannot provide the experience of being in three dimensions.

Therefore, Sloodle mixes the Moodle system with the virtual world of Second Life into one internet based three-dimensional tool for studying. The tried and true tools that have been well received by the community—Moodle can outstandingly fulfill the needs of classrooms in Second Life. The comprehensive possibilities of Second Life can greatly improve the online courses of Moodle. With the help of Sloodle the world of Second Life can be used as an alternative, three-dimensional Moodle client, which makes the classic, text-based websites much more interesting. Sloodle - which stands for Simulation-Linked Object Oriented Dynamic Learning Environment - creates a possibility for teachers to use Moodle as a background-database concerning courses organised in the virtual space (Livingstone, D. 2009.).

11.3. TIMELINE OF SLOODLE, VERSIONS, UPGRADES

As I mentioned above, the idea of Sloodle first came up in the article of the two researchers, when they raised the idea of a software package that connects a virtual space with an education system (Livingstone, D. - Kemp, J. 2006.).

After only two months of the study, the first 0.1 version of Sloodle was created. Days before starting the application, a group called SLoodlers was formed in Second Life. This group has been active since then, and we have been a member of it since 2010. This program – like sloodle.org – provides a communications platform for people who want to know about the topic and the tool system.

In July 2007 the Eduserv project started, whose goal was to create a final and well- functioning form of Sloodle. The project was called „Online studying in the virtual field with the help of Sloodle".

In December 2007 the 0.2 version of Sloodle was introduced, which used different methods in client-server communication. Object-orientated solutions were built into the application programming interface (API). MetaGloss, Sloodle Selector and Object Distributor were built into Sloodle in this version.

The 0.21 version contained a lot of changes. This was published in 2008. A Spanish language package was implemented in the tool system, and the Sloodle Toolbar was greatly enhanced and expanded. Examples of the toolbar's enhancement and are expansion are: the selectable chat channel, avatar-watching function, and help button. The options for registration and log-in have also increased, with the help of a loader to load URLs at the same time or an application which solves registration and log-in in one step. The Choice tool was also modified before publishing the module.

The 0.3 version was created in 2008. This contained an early version of Sloodle Controller, and the options of it are still actively used today. It is important that certain Controllers were able to manage different courses in the same area. Working with the Controller became more smooth and it could be changed to each user's personal preference. Automatic registration and log in was also presented in the 0.3 version. Certain objects in the virtual field were able to be controlled through the web. Further developments were made in Sloodle Toolbar, and through this publishing blog records was possible. The Quiz Chair - which is still very popular today was made more stable and more user-friendly. WebIntercom - which was made for recording the written conversations in Moodle - could be stopped. Other new tools were introduced too, like PrimDrop, Choice, Vending Machine, and Password Reset.

The new version of Sloodle (version 0.4) arrived in April 2009. Although this is a commonly used version and it is often marked as a reference, it is mainly famous for its Presenter tool. Presenter was a breakthrough in the system of Sloodle Tools, because this application made the dream of teachers come true. They were able to run their own presentations placed in Moodle in Second Life without uploading one single picture into the virtual world.

The official Sloodle 1.0 was created by the Eduserv Foundation and finished in August 2009. The period of beta-testing is over, and the whole system is useable now in real teaching processes. This version contained the following innovations: Presenter was developed even more, the server now has more options to upload, and now documents in PDF format can also be presented. Another new feature is that they managed to solve the disturbing thing that anyone could shift the presentations at any time. After this, one can set which avatars are entitled to do it. The virtual appearance of Sloodle Set was modified, it became more practical and was given a smoother layout. Tools contained the PictureGloss application as well. The questions associated with Quiz Chair could be answered shortly and with numbers too. AccessCheckerDoor was taken out of the tools.

Although the project supported by the Eduserv Foundation ended, it was easy to see that the development of Sloodle could progress further. The 1.1 version was created in March 2010. The new version corrected some security, compatibility, and stability problems.

Version 1.2 was the next available version. This was introduced on 22nd June 2011. This version also contained some solutions to stability problems, but the most important improvement was the Sloodle Tracker. This is a very special aspect that was developed at University of Ulster. This exciting tool of the Northern-Irish researchers satisfies the demands of today; allowing problem-centered goals to be integrated into the three- dimensional world. With the help of this tracker one can follow the students continuously in the pre-organised studying system.

Version 2.1 is the most up-to date version. We can connect Second Life and Moodle 2.5 with that.

11.4. CONNECTING MOODLE AND SECOND LIFE

How can one connect a web-based education system and a three-dimensional virtual world? If one thinks about it more, even the reason for the existence of the question itself is very interesting. The individuality of this idea showcases the creativity of Livingstone and Kemp.

However, there is more than one solution to solve the problem of how to make a link between Moodle 2.x and Second Life. For example, the software client to reach the virtual world can be modified so that it directly connects to the system behind the quasi-virtual education environment. Another option is to use an open source coded virtual world, so that one is able to change the server program maintaining the virtual space. After the change it will be able to reach the database of the quasi-virtual education system. If not too many people use the three dimensional virtual space and the quais-virtual education system at the same time, both applications could be using the same server without any problem.

11.4.1. BUILD OF SLOODLE

If one thinks about the basic construction of Sloodle, one thing is absolutely established. The tool system is made of two very different units. These are Sloodle Controller and Sloodle Set.

Sloodle Controller is a Moodle module, which can be built into the Moodle modules by people who have authority for it. With the help of this application one can create more Sloodle elements in the course and one can direct the process of giving permission for certain Sloodle objects in Second Life. In other words, with the help of this module administrators of the certain courses can control which virtual objects existing in Second Life can reach the Moodle-like data of the course.

Sloodle Set is the part of the toolbar which has to be rezzed in the virtual space of Second Life. „Rezzing" is a special expression. It is an artificial word, which is very commonly used amongst the users of Second Life. It means to materialise an object in the virtual space. While rezzing, the object(s) in the inventory come into being in the virtual world. After rezzing, the Sloodle Set has to be attached to the proper Moodle-based quasi-virtual study environment. Once all of these requirements are met, one can create the parts of the toolbar materialized in Second Life (Livingstone, D. 2009.).

11.4.2. TOOLS OF THE SLOODLE SET

11.4.2.1. CHOICE

Choice can be developed in two ways in the virtual space. There is a horizontal and vertical edition. The only difference between the versions is that one handles choices vertically, while the other does

so horizontally. This tool assures that students will be able to vote. The results can be checked both in Second Life and in Moodle. With its help the Choice in Moodle can be visualized in the three-dimensional virtual world of Second Life.

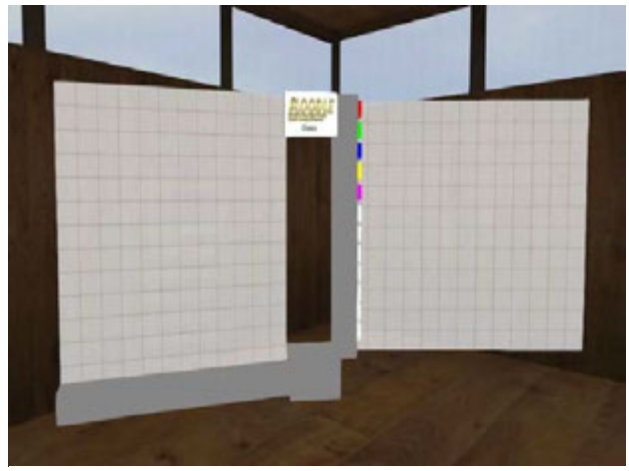


Figure 24. The Choice

The Choice module in Moodle is suitable for announcing voting for different things, or to collect information about the student in certain courses to get to know them. After activating Choice in the system shell and announcing that there will be a vote, one can create a Choice in Second Life. With the help of Sloodle the two tools above can be attached to each other, so the results of the voting can be represented in an expressive way. It is important to mention that one can set who – and after doing what – can have the authority to see other people's responses.

11.4.2.2. LOGIN ZONE

The Login Zone offers similar possibilities to the Registration Booth. Firstly, the user attaches the avatar used in Second Life with his account's belonging to the proper Moodle site. After this – just like using Registration Booth – certain activities of the avatar are recorded, and this helps regular teachers or researchers to draw certain conclusions.

The things mentioned above are the similarities between Login Zone and Registration Booth. Let us see the differences now.

The most fundamental difference is that while Registration Booth expects users to click on a certain button, Login Zone checks automatically – when logging into the controlled area - whether the given avatar is registered on the proper Moodle site or not. The big disadvantage of Login Zone is that it only checks whether the owner of the avatar is already registered on a Moodle site. It cannot check which course the student is attending. Developers are trying to improve the feature so that it can handle many courses.

In the picture one can see that the extension of the Login Zone is a three-dimensional cube. Because the cube of the Login Zone can only be one prime, so the maximum size of the area is a ten meter squared cube. A cube type prime can only be ten meters big. The other idea concerning development is to change the tool so that it is formed by multiple primes, and this way the controlled area can be larger.

Figure 25. The Login Zone

Another fundamental function of the tool is that after correct settings it provides an SLurl, which is a link in the three-dimensional space in Second Life. Using this link, the avatar will teleport into the Login Zone from anywhere within Second Life. This is a useful feature since novice users especially forget to use landmarks, and sometimes they cannot find their way back to the course field. In this case SLurl provided by Login Zone is a very good solution.

11.4.2.3. META GLOSSARY

MetaGloss is a tool to represent Moodle thesaurus in three-dimensions.

The original name, Meta Glossary comes from two facts. Firstly, that it represents the Glossary module of Moodle, secondly that it does so in Second Life. In other words, in the Metauniverse or Metaverse for short.

Figure 26. The Meta Glossary

In MetaGloss users can find expressions that were previously placed in Moodle. There is one big difference; in Moodle there is a subject index and you can search based on initial letters, while MetaGloss omits these options. At first this might seem like a problem, but it is certainly not. In the virtual space the way of searching for expressions is the following: First, one has to activate the tool by a simple left click. After turning it on one has to write „/def" into the common chat space, and after that one puts one space and the required expression as well. If the expression being searched for is in MetaGloss, the program writes it into the common chat space. Note that one does not have to write the whole expression into the searcher, because the tool can find it even based on portion of the word. Another important piece of information is that every avatar that is within 19 meters can see and read the common chat, so this tool can also provide a way of studying as a team.

11.4.2.4. PASSWORD RESET

Password Reset is not really a tool for helping the teaching-studying process.
After clicking password reset, the user's Moodle password gets deleted. At the same time, the system creates a temporary new line of characters, and it sends this to the avatar's master in Second Life. This line of characters will be the password for the registered user, which can be changed later to a different one that is easier to remember. This tool is recommended to use when automatic registration is possible.

Figure 27. The Password Reset

11.4.2.5. PICTURE GLOSSARY

Picture Glossary is a tool which works very similarly to MetaGloss. However, MetaGloss contains expressions, while the Picture Glossary contains visual information, mostly pictures. It is true though that some pieces of information – just like in the case of MetaGloss – have to be placed in Moodle. Nonetheless, there are some very big differences between MetaGloss and PictureGloss.

Figure 28. The Picture Glossary

When using Picture Glossary, the first step is to upload the chosen picture from one's computer to Second Life. The picture goes to the inventory as texture. After that, one has to create a Glossary module in Moodle, where a record has to be made for the picture that already exists the inventory. The record has to be named and then – like identifying an expression – the Universally Unique Identifier [uuid] has to be given.

One example from Second Life. The following uuid-identifier defines a texture about my avatar: 481ac78e-7e16-55b5-2765-064f7ad5d8e8. The identifier uses 16-byte and consequently, 128-bit. It is made up from 32 characters and 4 hyphens. In Second Life there is an individual uuid-code for avatars, objects and textures.

After typing in the code one needs to set the parameters of the presentation. These parameters are width represented by 'x' and length marked with 'y'. In Second Life these are centimeter-based. This means, that after writing 200:200 behind the uuid-code, the picture will be showed on a two by two meters square. After this, one has to put the uuid code of the object that he or she wants to see the picture on.

If a student wants to search amongst the pictures, he or she will search amongst the textures in the inventory of the teacher or course leader, which the student gave the parameters for in MetaGloss. Searching is possible after putting the key word '/pix' and a space and writing the name of the picture in the common chat after the tool is turned in.

11.4.2.6. PRESENTER

In Second Life one can represent the presentations which were previously placed in Moodle. This can be done without uploading any picture into Second Life. The Presenter can contain presentations, websites, and/or videos.

Figure 29. The Presenter

One can set a parameter so that the shared object can be modified only by the creator or by anyone else as well. It could be important that the students are able to go forwards and backwards through a presentation.

11.4.2.7. PRIMDROP

PrimDrop is an individual tool to help students turn in the solutions to the tasks. They do it in the virtual space of Second Life, and the turned-in results can be read in Moodle too. To run the tool a new Moodle module has to be installed in Moodle.

Figure 30. The Prim Drop

Actually, in practice the first step is that the teacher has to create a problem to solve in Moodle. With Sloodle Controller he or she creates it as a notepad in Second Life. After that they put it on a prim. The students can reach the task in Second Life via this prim, and after solving it, they place the solution in PrimDrop. A teacher can check the results in Moodle.

11.4.2.8. QUIZ PILE-ON

Quiz Pile-on – like Quiz Chair – was created for answering multiple-choice tasks. Before using the application, the tutor has to create a test in Moodle, which he or she can carry out with Quiz Pile-on in the virtual space.

Figure 31. The Quiz Pile-on

The tests can be started by clicking the cylindrical part of the tool, and then clicking the Start button. After that, the first question of the test appears in red above the cylinder. The possible answers are represented by hemisphere-shaped primes. The letters of the answers are blue and they are placed above the hemispheres. The participants of the course have to choose a hemisphere; of course the one they think belongs to the right answer. They can do it by clicking on the hemisphere. Once they are finished with this, they can confirm the reply by clicking Answer. After confirming the answer, the hemispheres disappear and only the one with the correct answer remains. The students have to follow the same procedure when answering the remaining questions.

11.4.2.9. REGISTRATION BOOTH

There is a possibility that eases identification in Second Life and in Moodle. It connects the avatars with their master's Moodle identifier. *(Figure 32.)*

To start the process, click „Touch to register your avatar in Moodle" after activating the Registration Booth. Firstly, the system checks whether the avatar that is using the booth is registered in Moodle. If it is already registered, nothing happens. If it is not registered, a new record will be created about it in Moodle and by using the „Go to page" button the Moodle page connected to the URL will be loaded. It can load it in Second Life or in an external browser too, according to settings.

Figure 32. The Registration Booth

11.4.2.10. TOOLBAR GIVER

This device has numerous useful different little tools.

Figure 33. The Toolbar Giver

Basically there are three different options built into the toolbar's multifunctionality. The following possibilities are open for users.

– one can write a Moodle blog note in the virtual worlds of Second Life
– one can use different classical motions and animations in the classrooms
– one can list the Moodle names belonging to the avatars in the area.

11.4.2.11. VENDING MACHINE

Sloodle Vending Machine is mainly for sharing certain objects in the virtual world. Not only themes written on notepads but any other object can be provided to the students.

Figure 34. The Vending Machine

After the application was rezzed by a tutor or a course leader in the virtual space, it has to be matched with the Distributor module of Moodle. After proper configuration the tutor will be able to place objects in the Vending Machine. After this the students will be able to reach the objects in it. The names of the objects in the Vending Machine appear in the Distributor module and Moodle. This is also important because the tutor using his or her Moodle Distributor can move the shared objects from outside Second Life too.

11.4.2.12. WEBINTERCOM

WebIntercom connects Second Life chat with Moodle chat. This means that the chat runs parallel in Second Life and in Moodle. This could be useful for many reasons.

Figure 35. The Webintercom

This also gives a possibility to people to join the chat who are not logged in Second Life. Also, the Moodle chat conversation can be saved, so the comments for the virtual site can be reread in the archives. The text goes into the Moodle database and one can reach it after logging into the system.

11.4.2.13. QUIZ CHAIR

The students can practice and fill out tests in the virtual world. The result of these tests are saved automatically in the Moodle database, and the teachers can check these in the Moodle gradebook.

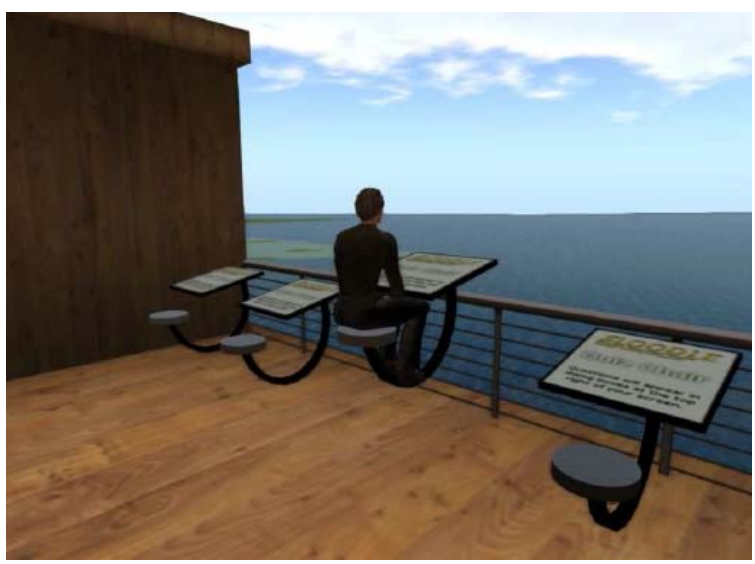


Figure 36. The Quiz Chair

After creating the Sloodle-based connection, one can download the already-created tests from Moodle in order to use Quiz Chair. Since Sloodle 1.0 the types of questions can be:

– single or multiple choice tasks
– true/false questions
– questions expecting short answers
– questions expecting answers with numbers.

The answers for simple/multiple choice and true/false questions have to be given in the chat module in Quiz Chair. The short answers or numbers have to be written into the local chat window.

Before starting to take the test, the students sit down in test chairs with their avatars. When the students answer a question, depending on whether they answered correctly or incorrectly a certain event will follow. If the answer is right, the chair elevates a little with the avatar inside it. If the answer is wrong, the chair drops down the same amount. Since more people can take tests at the same time, there is the possibility of a race. Whoever gets to the given height first, wins.

11.4.2.14. TRACKER

Sloodle Tracker is a new tool in Sloodle, and it actually means two things: Tracker scanner and Tracker button. The application was developed at University of Ulster in Northern Ireland.

Figure 37. The Tracker

The purpose of the Tracker is to assure that the tutor is able to integrate the certain educational units from the system shell to the 3-D virtual world. After setting the tools the tutor is able to watch the progressions of students in Moodle as well. This does not require a lot of extra work from the students, they only have to move their avatars to a specific area or to press a button in the virtual space as an

extra task. The user is not limited to placing only one problem-based task in the Second Life space. It is possible to place multiple tasks in Second Life too, should the user want it (Callaghan, M. J. et al. 2009.).

11.5. SLOODLE BASED GOOD PRACTICES

11.5.1. SLOODLE CASE-STUDY IN THE UNIVERSITY OF THE WEST OF SCOTLAND IN 2009

This case study regards using the Sloodle toolbar and about how it was able to help the teaching-studying process in the two groups of University of the West of Scotland. In the first group, Second Life was used as one of the primary teaching methods. In other words, the people in this group often used Second Life. The other group used Second Life only occasionally while studying.

11.5.1.1. THE TWO GROUPS

The Collaborative Virtual Environments course is a facultative subject at the University of the West of Scotland. In this course students study about collaborative technologies, while at the same time they use them in practice. However, knowing the technologies in theory and in practice is not all the course is about, students also have to work creating and testing new collaborative tools, or expanding older ones. Second Life as a technology has been a part of this school subject since 2006.

On the other hand, the other group that was examined was studying „Introduction to the virtual worlds". This group took the course during the program called „Studying for lifetime" and students from full-time and distant courses could take it too. While studying in the course the students examined the fundamental base of many virtual worlds, from the view of fun, education and common usage. They only learned about Second Life and studied it occasionally at the end of the course.

The Collaborative Virtual Environments course was directed from one location, but students could study it in two different locations, Paisley and Dumfries, located 130-140kms from each other. The lectures could be watched online, live, and\or through a recording, and the students from the two places could meet and communicate at a given time in Second Life.

11.5.1.2. THE COLLABORATIVE VIRTUAL ENVIRONMENTS COURSE

Students in the Collaborative Virtual Environments course were given the first task, to introduce themselves to each other via a video message, which they were provided access to by a video-sharing program. Besides that, students were given projects to choose from. Since the students had quite different IKT backgrounds, the projects required using the basic technology of Second Life all the way up to certain specific applications in it.

The four projects chosen by the students were:

– Changing the client of Second Life – The client of Second Life has an open source code, so the student can download and modify it freely. The steps of the programming were in C++ language. This project was chosen by students who were experienced in programming and often practiced with real coding processes.

– Second Life and robotics – there are many robotic and chatting robotic technologies based on and using artificial intelligence in Second Life. The students had to work with these technologies concerning artificial intelligence in Second Life.
– Creating a virtual university in Second Life – this big project examined how and at what level students can create a virtual university campus in Second Life. Half of the whole researched area was given to them to work on.
– Helping a marketing campaign – in order to make the marketing campaign about „Returning to Scotland" popular the students had to develop web- and virtual-based innovations. They could use one fifth of the region for this (Livingstone, D. 2009.).

11.5.1.3. GET ACQUAINTED WITH THE SECOND LIFE

The goals of students during the first week of the course which specialized in Second Life were:

– registering in Second Life
– logging into Second Life
– finding the area of the Virtual University
– basic knowledge about the building tools.

After logging into Second Life the students had to join a given group as their first task. This way the students quickly became familiar with chatting, private, and common messaging.

As their experiences displayed, students learned the methods of written communication. It was clear that this was not the first time they used this, the previous communications in web-based environments had a positive effect on talking in Second Life. Since not too much time was spent on the questions of communication, the introducing and building could be properly interpreted.

It is important to say that the creators of the course provided many beginner courses for the participants for free through Vending Machine. I did the same thing in the Second Life course for the master's degree students from ELTE Andragogy. I made pieces of clothes available for free so that students could form their avatars in a more individual and appealing way. Vending Machine can be reached in both Second Life and Moodle, and authorized people can control it. With proper settings only the Moodle-registered participants of the given course can have access to the free objects of the machine.

During the second Second Life lesson the students were split into groups. The task was to interact with the Registration Booth. The goal was to connect the avatars in Second Life with the profiles in Moodle. This exact same step was taken at the beginning of the course by the students from University of Debrecen Department of Health Sciences specialized in health organisation. Zsolt Kristóf was the leader of this course for four semesters. The students in Eötvös Loránd University specialized in Andragogy also studied this under Dr. János Ollé, and Zsolt Kristóf was a teacher and an adviser in this course. This matching could seem like a small, easy step but it is really important and it is absolutely indispensible when students want to use certain tools of Sloodle.

After matching, the groups went to different areas, not to disturb each other and also because they only wanted avatars form their group to be able to read the conversation. The communications were in written form, so because of a tool of Sloodle Toolbar - WebIntercom it was possible to keep track of the conversations in Moodle Chat, and Moodle automatically recorded it as well.

11.5.1.4. ACTIVITIES IN A VIRTUAL CLASSROOM

The material of the course was shared mostly by video sharing tools, though certain courses were held in the virtual world of Second Life. One of these courses concerned itself with the educational tools that can be used in a virtual world. To keep the attention and interest of the students during the lecture, Sloodle Choice was used, which realised the 3-D projection of Moodle Choice. This tool was also used at the virtual distant teaching project of ELTE, to get the opinions of the students during or after the lessons. On the tool one can set a multiple grade scale, which goes from „I completely agree" to „I completely disagree". Statements were created in Scotland and in Budapest too, and the students could choose the proper statement that matched their opinion. The opinion of the students showed up on the tool and it provided immediate feedback for both the students and the tutors. During the other lessons the Scottish colleagues directed their students to different interesting, exciting areas.

A virtual study trip is – not like the real one – very easy to organise and carry out even in Second Life. The creator of the certain areas are very happy to show their places around and they are very proud of their work. If you think about it, this is why they did what they did. Numerous marketing, common regions exist and some of them are supported by countries or universities. One of the study trips of the Collaborative Virtual Environments course was in the region of Open University, under Anna Peachey.

11.5.1.5. THE INTRODUCTION TO THE VIRTUAL WORLDS COURSE

The students of the Introduction to the Virtual Worlds course were only occupied with Second Life for a few weeks, after getting to know some virtual worlds at a basic level. There was Moodle-based help for this course too. It was very important to know how to use the Moodle forum, which made asynchronous conversations possible between the groups. Students wrote a Wiki entry about their experiences in virtual worlds.

The students of the Introduction to the Virtual Worlds course had much fewer possibilities to use the tools from Sloodle, since they only joined Second Life in the last weeks of the course and since they did not have to do any content-creating tasks. However, they had to give presentations and to create them they used Sloodle Presenter. By using this tool the students could concentrate on their presentation work and did not have to think about how to upload pages into Second Life or how to modify notepads. Nevertheless, it still gave them some „quasi-content maker" experience.

Within the frame of this project certain elements of Sloodle toolbar were available for students from two courses of very different types, contents, and purposes. The participants learned how to use these tools very quickly. They used the tools in making the common work more smooth, and realising their presentations in the virtual space. I have to emphasize that although a common Second Life citizen has to know something about virtual possibilities, these students were able to use the basic tools without any expertise in content making, object-creating and/or object-modifying (Livingstone, D. 2009.).

11.5.2. THE DUBAI-KOREA SLOODLE CASE STUDY

The Korean Science and Technical Developing Institute and the Women's College of Dubai set the individual and special goal in 2008 that they would carry out a seven week course held and taught together. They were curious about how students from completely different background and cultures would work together. For the mutual work they used Sloodle tools as well. They examined what effects Sloodle tools had in the teaching-learning processes in Second Life. Using Second Life and

Sloodle was only one part of the course, so it was also exciting to see how the two applications mentioned above can be used with other communications technologies together.

11.5.2.1. THE DUBAI-KOREA CULTURE EXCHANGE PROGRAM

This Dubai-Korea virtual culture exchange program was a very special effort in the Spring of 2008. It used many modern ways to communicate in order to connect the students of the two countries. Chris Surridge (Korean Science and Technical Developing Institute) and Nicole Shammas (Women's College of Dubai) were the leaders of the project. They created the seven week course in which the students had to work in teams and the goal was to come to know many pieces of information about each other. Both institutes took students into the project who spoke English as a second language. Therefore, the common language was English.

It is important to say the students' interactions and the studying process were helped by numerous technical applications. These were – without the need to be exhaustive – Moodle studying system, podcasts, video conferences and the virtual world of Second Life. They could reach the necessary materials, and – like in the course that I led for 6 semesters – Moodle was very important, because they used Sloodle toolbar through it.

11.5.2.1.1. INTRODUCTIONS, ENCOUNTERS

At the beginning of the project both institutes made their students form groups of 5 people. After that, these groups were paired with a group from the other school. The first task of these 10 person groups was to get to know each other and collect information about each other. The groups used recorded voice messages, which they placed in certain places of Moodle using the building tool of Moodle Audio Recorder.

Before doing the next task both sides had to make a sort of cultural capsule. They placed real, physical objects in it, which were connected to their culture. These capsules were sent to each other and were opened during a video conference. This was the moment when the students saw each other for the first time.

After all this, the participants of the course met in the virtual world of Second Life. For registration they could use the help of a video, and on the course's internet site there was a link to download Second Life. In the first task using Second Life, it was required to use three of the Sloodle toolbars. These were AccessChecker, Vending Machine and WebIntercom.

To record the activity of the avatars in Second Life, there was a need to connect them with something. Many people – like those of us in the projects concerning Second Life and Sloodle in the University of Debrecen Department of Health Sciences, and in Eötvös Loránd University Department of Pedagogy and Psychology – used the Registration Booth to connect the two applications. But in the Dubai-Korean project they used another tool that is similar, AccessChecker. This tool does not require people to click on a given object to establish the connection between the avatar and the Moodle account, while the Registration Booth does. The AccessChecker controls a well-defined area in the virtual space of Second Life. If an avatar comes to this area, the system automatically examines whether the avatar is connected to the proper pre-set Moodle system. If yes, nothing really happens. If not, the user receives a link containing the further steps that can be taken in order to connect them. The new Sloodle toolbar does not have AccessChecker any more, one can use Registration Booth to connect Second Life and Moodle.

Vending Machine is a tool that can be reached and directed both in Second Life and Moodle. With its help one can provide objects to the avatars, who can ask for these objects at the Vending Machine

for free. Teachers usually puts themes written on notepads in this tool. Nevertheless, it is perfectly good for what it was used for in the Dubai-Korean project, which is providing students with free objects. We ourselves also used this tool more for than sharing themes.

The third used tool in the project was WebIntercom. Written, text-based communicatons had to be made between the different student groups in Second Life. This also meant that the students, who spoke English as a second language had a chance to practice. Every group pair was directed to a different area so as not to disturb each other. At every area like this a switched-on WebIntercom was waiting for them, so their talks were saved in Moodle.

11.5.2.1.2.CONSEQUENCES OF THE STUDY

During the seven weeks period, while the students were using the virtual world of Second Life and Sloodle toolbar, people gained many experiences. It was true for all group activities that they were mostly about student-student type tasks. By using Second Life and Sloodle students from Dubai and Korea had a great possibility to get to know each other's culture. The environment was very motivating, and it gave students the possibility to improve their written and communication skills.

The three tools of Second Life that were used worked very well. It was an advantage that the students did not have to learn how to use the tools, because very simple ones were built into the study. All three, the AccessChecker, Vending Machine and the WebIntercom are very easy to use. It is important to mention that for the proper working of Sloodle the settings of every single tool have to be very accurate. This will take a lot of resourcefulness from the course creators and tutors.

According to their feedback, the participants of the study were happy and enthusiastic to use WebIntercom as a tool for studying. Vending Machine was very useful for students who lived on a private island and did not go to the other areas of Second Life. It was useful because they could be provided with the proper amount of objects, clothes, written notepads and other things. AccessChecker was only important at the beginning of the course, later it was not really useful, but in the case of this tool it is perfectly natural.

Concerning Sloodle Toolbar the following statements were set after the Dubai-Korean virtual culture exchange program. On the one hand, properly using the tool does not have to be studied for weeks, and on the other hand, building the tools into the study process has great advantages (Livingstone, D. et al. 2008.).

11.5.2.2. INTEL IRELAND - SKOOOL.IE

Skoool is an international online education program that won an award. It was developed by the Intel Performance Learning Solution (IPLS) group within Intel. The program was originally started in Ireland in 2002. 27 countries have joined from all over the world, and the work is done in 12 languages. Science and math subjects form the bulk of the program, and they provide content and tool for kids aged 10 to 16.

Skoool started a joint effort with the University of Ulster Department of Information Technology in the field of virtual development. The goal of this project was to provide collaborative challenges for the students in the virtual space. The tutors could track and measure the work of the students in the examined space. This was possible mainly with the help of Sloodle, more accurately with Sloodle Tracker. The certain development levels and positions were registered in Moodle.

11.5.2.3. CYPRIS CHAT

Cypris Chat is a typically informal, collaborative organization to target learning English in Second Life. This group has more than 300 members. They are from all over the world, and some native English speakers are in the group too. A few members are English teachers who are examining how the virtual space can help with teaching or studying English.

Cypris Chat was founded by Mike McKay, who also coordinates and handles certain common activities, organises virtual trips and contests in Second Life.

11.5.2.4. A KAIST ELEARNING PROJECT

In the organisation of the Korea Advanced Institute of Science and Technology (KAIST) a special ten mission adventure can be run in Second Life. To do all this, the researchers of the Institute use Sloodle tools. The adventure tour is called Devil Island Mystery. Groups take part in the trials, when the members have to find traces of a 20 year old mystery in order to escape from the island. The task itself contains two big parts, one is a local program, and the other is a collaborative work, in which students from the Kwansei Gakuin University, Japan take part too. In one of the tasks for example, six special plants have to be clicked on to collect their leaves. With the help of Sloodle tools the creators of the project can watch and monitor the activities of each group.

11.5.2.5. MUVENATION

MUVENation is an organistion to assure that teachers who would like to use new tools and methods in teaching can do a one year long further training after they have earned their diploma. The name of the program is „Teaching and learning by using multiuser virtual environments". It is mostly recommended for teachers who want to strengthen their teaching methods concerning motivation and participation by using the affects of 3-D virtual spaces.

MUVENation is supported by the European Committee. It was started in 2007 as a part of the studying for a lifetime initiative. Nearly 250 tutors from all over the world were involved in it. They used wide ranging online resources, tools, and web 2.0 solutions.

The options of Sloodle toolbar were used very often. They were mostly used to support the teaching-learning process properly. To teach Sloodle more than 100 tutors applied from 27 countries (Livingstone, D. 2009.).

12. APPLICATION DEVELOPMENT INSIDE A VIRTUAL WORLD – SCRIPTING IN SECOND LIFE

The virtual space of Second Life has great possibilities. It is a professionally designed environment with a well-defined appearance. It makes virtual existence and virtual interactions more authentic. On the other hand, just imagine how lifeless it would be if there weren't any different scripts. The builders create the complex objects by using prims with different types and numbers. Prim is the smallest fundamental unit in building. Prims can be cubes, spheres, cylinders and other basic figures. One object is usually made of multiple prims, which are usually linked to form one unit. The root prim is the last prim which was highlighted in the process of linking. The non-root prims are called child prims. The root prim is the main hyperlink for all the other prims in the object. This hyperlink can be the name of the object, or where and how should the object be placed.

These objects would be worth much less without prims, because of their intense statics. The scripts make the virtual world of Second Life alive, with their help the avatars can be more like humans. They have a great affect on the inhabitants of the virtual space, they improve their relationship-forming skills with each other and with the environment as well.

12.1. THE BASIC LSL SCRIPT

Script is a tool of Second Life and it is similar to a notecard or any other tool that is different for every avatar in Second Life. The scripts are mostly placed in prims, where they can display their affects. In that case, the script can change the prim's and even the object's behaviour and appearance. The object can move, can change its color, form, and\or texture. It can also make it connect to the world in some other form.

Although this book does not have the goal to introduce the features and the creation of the Second Life scripts in great depth, we have to clarify some fundamental features. Users who do not want to be occupied with scripts for a long period of time typically create a very basic one. Sometimes users create more advanced scripts simply out of curiosity. In the case of a recently created object – which is according to its settings one prim, a cube – with the option "New script" one can create the basic scripts. As a result, a simple script gets into the Contents folder of the object. The script is only responsible for writing „Hello Avatar!" into the local chat and if one clicks on the cube containing the script, „Touched" appears at the same place. If one left clicks on this simply stored script, he or she can look up the source of the given script in the built-in developer environment of Second Life. The source is in the next picture.

```
default
        state_entry()
        {
                llSay(0, "Hello, Avatar!");
        }
        touch_start(integer total_number)
        {
                llSay(0, "Touched.");
        }
```

Figure 38. The basic LSL script

Via this short and simple script one can formulate certain features. Firstly, there is a special private script language developed for this purpose in Second Life. It is called Linden Scripting Language and with its help one can write programs or part of programs. This language is mostly marked as LSL. The syntax of LSL is very similar to the C, or Java programming languages' syntax. This is so noticeable that

LSL is considered to be the follower of C (Takács, P. - Kristóf, Zs. 2007.). The LSL is event driven, this means that the outcome of the program are defined by events. These events could be the arrival of a message, the physical contact between the object containing the script and another object, or other user activities.

LSL models the script as a final state automation, which means that it put the different activities in separated states, and between the states explicit transitions exist. LSL has special, individual built-in data types. Vectors are like this for example. The language also has numerous functions to manipulate the system that simulates the physical world in the sense of interactions between avatars and communication from the real world.

12.2. TYPICAL CHARACTERISTICS OF AN LSL SCRIPT

- Every command has to be ended with a semicolon.
- LSL is block-oriented and the block has to be placed between opening and closing braces.
- The variables have different types and they have to be declared in an explicit way. This means that one has to precisely pre-make the data type of a variable.
- Every single script, even the simplest ones have to contain a default state. In this state there is an event controller, a subroutine that can handle the possible inputs. An input can be a message from another object or from an avatar.
- The default state has to be defined in the script before any other state is defined by a user.
- The LSL scripts can contain private functions and global variables defined by a user (Moore, D. et al. 2008.).

12.3. VARIABLES IN LSL

- integer – one can store whole numbers with integer data type. The smallest number can be 2.147.483.647 and the biggest can be 2.147.483.648.
- float – one can save decimal numbers with float data type. The smallest number is 1.175494351 E-38, the biggest one is 3.402823466 E+38.
- vector – Vector data type is a special, 3-D structure. The general form is <x, y, z> and all three components are float type data. It is used to save data about color, position or direction.
- rotation – Rotation data type is a special, 4-D structure. The general form is <x, y, z, s> and all four components are float type data. It is used to save data of turning or rotation in Second Life. Rotation data type is also called „quaternio”, it means the exact same thing.
- key – In the key data type – which is specialized string data type – one stores the UUID code of the certain Second Life units. UUID stands for Universally Unique Identifier, Avatars, objects, voice records, textures, and other units installable in the toolbar all have this identifier in Second Life.
- string – In string data type one can store a character string. Its length depends on the capacity of the memory connected to the string. Some functions can also maximize the length of a script.
- list – List is a heterogeneous data type in LSL. It can contain any type and no matter how many elements except of its own type. One example could be: [32, „Jonapot”, 72.81].

12.4. ANALYSIS OF A SIMPLE LSL SCRIPT

In the followings we are going to present asking for time in Second Life using a somewhat more difficult script in LSL. The original creator is Beverly Larkin, the modifications in the scripts were placed in the program by us. In the script we use the llGetwallClock() built-in function, which gives back the already passed seconds of the day according to the Pacific-ocean time (PST). This time zone is the official time of Second Life, since the Second Life headquarters is in San Francisco.

```
integer H;
integer M;
string AP;

default
        {
                touch_start(integer total_number)
                        {
                                integer T = 28800-(integer)llGetWallclock();
                                        if (T >= 86400)
                                                {
                                                        T = T - 86400;
                                                }
                                        if (43200 <= T < 86400)
                                                {
                                                        T = T - 43200;
                                                        AP = "PM";
                                                        H = T / 3600;
                                                        M = (T - (H * 3600)) / 60;
                                                                if(H == 0)
                                                                        {
                                                                                H = 12;
                                                                        }
                                                }
                                        else
                                                {
                                                        AP = "AM";
                                                        H = T / 3600;
                                                        M = (T - (H * 3600)) / 60;
                                                                if(H == 0)
                                                                        {
                                                                                H = 12;
                                                                        }
                                                }
                                        if(M < 10)
                                                {
                                                        llOwnerSay((string)H + ":" + "0" + (string)M + AP);
                                                }
                                        else
                                                {
                                                        llOwnerSay((string)H + ":" + (string)M + AP);
                                                }
                        }
        }
```

Figure 39. An LSL script broadcasting the local time in Hungary to the chat panel

For the name of the object we chose „A pontos ido" („The exact time") character string. When the llOwnerSay function is required, the script - which as a feature of the formula, writes the name first - gives the character string „A pontos ido: 4:28 PM" back.

We will explain the script above without the need to be exhaustive.

Before setting default state we defined some variables. These were H, M and AP. H for Hour and M for Minute were whole numbers; AP, which could have AM or PM content got a string data type.

The script only contained the default state. By using touch_start function we reached that the whole script would run in Second Life by left clicking on the object. Not only the creator, but also any avatar nearby clicking on the object could start the script.

In the integer T=28800+(integer)llGetWallclock(); command we defined T variable, which represented the number of seconds passed from the day when the built-in llGetWallclock() function was used. This function above gives the number of the seconds already passed according to PST, so we had to add the difference between that and the Hungarian time zone in seconds, which is 28800.

After this we had to separate two different cases with 'if'-s. But before doing that, we had to think about the case when the value of T is bigger than 86400 seconds, namely a day. In that case 86400 must be subtracted from T in order to get the proper Hungarian time.

In the first separated case the passed seconds indicate time of the afternoon, so we made the program write PM after the time. After setting the variables responsible for the hours and minutes, we used another 'if' to correct returning with 0 hour. In these cases the script gives 12 hours back. In the other separated case the passed seconds indicate time before noon, we did the same things above only with the difference of writing AM instead of PM.

Figure 40. The object containing the script, and the result of the LSL script in Second Life

After all these, only the actual showing up remained, which we used the llOwnerSay() function for. The time is written in the common chat, which can be seen by the avatars nearby. We also made two different cases here. In the first one, the minutes were under 10, and I made a 0 appear before the single figure.

Of course, many types of scripts exist in the virtual space to control the movements of avatars or objects. There are even some to react to the avatars' activity. I chose the script above to explain because although it is simple, it has all the special features of LSL.

13. REFERENCES

[1] Hall V., Conboy-Hill S., Taylor D. (2011). Using Virtual Reality to Provide Health Care Information to People With Intellectual Disabilities: Acceptability, Usability, and Potential Utility. Journal of Medical Internet Research 2011; 13(4).

[2] Kristóf Zs., Bodnár K. (2008). Adatkezelés és adatvédelem az egészségügyben. Informatika a felsőoktatásban 2008 / szerk. Pethő Attila, Herdon Miklós. p. 148.

[3] Palazón E., Moreno C., Arbués J., Lafuente A., García I., Guillen S., Esteban A., Clemente S., Marco A., Gargallo P., López C., Botaya R. (2012). Experience with using Second Life for medical education in a family and community medicine education unit. BioMedCentral Medical Education 2012, 12:30.

[4] Salt B., Atkins C., Blackall L. (2008). Engaging with Second Life: Real Education in a Virtual World. Literature Review – The SLENZ Project for the New Zealand Tertiary Education Commission 2008.
http://slenz.files.wordpress.com/2008/12/slliteraturereviewa1.pdf

[5] Lewin K. (1972): Mezőelmélet a társadalomtudományban. Gondolat Kiadó, Budapest.

[6] Vogel D., Guo M., Zhou P., Tian S., Zhang J. (2008). In Search of Second Life Nirvana. Issues in Informing Science and Information Technology, 5.

[7] Lim Y. T. K. (2009). The six learnings of Second Life: A framework for designing curricular interventions in-world. Journal of Virtual Worlds Research, Vol. 2. No. 1.

[8] Johnson D. W., Johnson R. (1999). Learning together and alone: Cooperative, competitive, and individualistic learning. Allyn and Bacon, Boston.

[9] Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. American Psychologist, 34.

[10] Brown J., Duguid P. (2000). The social life of information. Harvard Business Press, Boston.

[11] Hung, D. W. L., Chen, D. T. (2008). Learning within the worlds of reifications, selves, and phenomena: Expanding on the thinking of Vygotsky and Popper. Learning Inquiry 2.

[12] Livingstone D., Kemp J. (2006): Putting a Second Life "Metaverse" skin on Learning Management Systems. In: Livingstone D., Kemp J. (eds): Proceedings of the Second Life Education Workshop at the Second Life Community Convention. The University of Paisley, Paisley.

[13] Livingstone D. (2009): Online Learning In Virtual Environments with SLOODLE, Computing and Information Systems Technical Reports, No 50, San Francisco.

[14] Callaghan M. J., McCusker K., Losada J. L., Harkin J., Wilson S. (2009). Engineering Education Island: Teaching Engineering in Virtual Worlds. Italics, Vol. 8, No. 3.

[15] Livingstone D. (2009). University of the West of Scotland: Tale of Two Classes.
https://www.sloodle.org/blog/wp-content/uploads/2009/10/UWS_SLOODLE_CaseStudy09.pdf

[16] Livingstone D., Surridge C., Shammas N. (2008). Using Sloodle: Dubai–Korea Virtual Cultural Exchange. Using Sloodle to support learning and teaching.
http://www.sloodle.org/moodle/file.php/1/SLOODLEcasestudy1.pdf

[17] Takács P., Kristóf Zs. (2007). The investigation of the development of programming languages. Proceedings of the 7th ICAI Conference, Eger, 2007. 327–332 p.

[18] Moore D., Thome M., Haigh K. (2008). Scripting Your World – The official guide to Second Life scripting. Wiley Publishing, Inc., Indianapolis