Master’s Thesis in Informatics

Using Virtual World in Education: The case of Second Life

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Abstract

With technology being advanced and many new teaching methods being implemented, considering virtual worlds for teaching is quite innovative and interesting. A virtual environment is an artificially constructed representation of a natural or imagined environment. Virtual worlds consist of enactment for terrains, avatars, objects, textures, and other forms of digital assets. Many virtual worlds like Alpha World, Delta 3D, Second Life etc. are available today. An avatar can be defined as a computer user’s representation of him/her-self within the virtual environment.

Today, educational institutes have been using virtual worlds in various fields like designing user interfaces, nursing courses, cooperate training, leadership training programmes. But certain aspects need to be examined thoroughly like how virtual spaces are influencing education, how students and teachers understand learning in virtual worlds while interacting through avatars where communication lacks body language and is limited to seeing, hearing and talking. Our study was conducted on a single course called Business Talking offered in Second Life by Linnaeus University. This course mainly emphasizes on technical and administrative presentations in English.

The main purpose of our study is to investigate how students and teachers understand learning in such environments and identifying the factors which are related to this. Relating to the purpose the research question “How do students and teachers perceive learning through avatar-based interaction in virtual world environments? “ was investigated.

Pedagogy and general theories like constructivism, cognition, virtual world, synchronous versus asynchronous e-learning were used in our study.

A qualitative interpretative case study was conducted. Data was collected through observations and interviews. All the sessions of the course were observed and interviews were made with five students and one teacher of the course.

The main results include students perceive more through avatar education as they get a sense of real feeling when compared to other online education systems. Also, performing activities in different places of SL such as camp fire, near waterfalls, different cultural places etc. made them perceive well as they feel relaxed and less pressure. Second Life's environment helps to simulate real conditions and situations which help them to perceive more. But factors like usability of avatars, technical problems and getting adapted to the environment play an unfavourable role in perceiving learning. Both the teachers and students have to be constructive and good pedagogical decisions have to be made when a problem arises. Another main result was that, lack of body language does effect in perceiving learning.

Keywords: Virtual Worlds, e-learning in language, Second Life, Education.
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Yours Sincerely
Viri Appaneni And Yenus Likisa.
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1 Introduction

This section is an introduction to our research. Here we discussed the motivation, research problem, purpose and research question.

Education system has undergone many changes in the past few decades. From the traditional classroom teaching to distance learning; e-learning to teaching in virtual worlds, improving the educational standards has always been the primary goal. With high technological advances, teachers today should be capable of creating digital learning environments and designing online activities in cooperation with other teachers (Retalis, Papasalouros, Avgeriou and Siassiakos, 2004).

A virtual environment can be defined as an artificially constructed representation of a natural or imagined environment (Biocca and Levy, 1995; Blascovich, et al., 2002 and Lanier, 2001). Zhu, Wang and Jia (2007) defined virtual world as a “computer-simulated persistent environment similar to the real world”. It is usually created for its users to inhabit and interact through avatars. An avatar can be defined as a computer user’s representation of him/her-self within the virtual environment (Second Life, 2007). Today, we can find many virtual world platforms like Active Worlds, War of World Crafts, Twinity, Kaneva, Smallworlds etc of which Second Life is the most popular one. According to Chang, Gütl, Kopeinik, Williams (2009), it was estimated that by 2011, 80% of active Internet users will have an “avatar” in some form of virtual world environment.

Virtual worlds are being used by many educational institutions, organizations, medical academies for educational, business, marketing purposes. Companies like Apple, Sony Ericsson, Toyota, and Adidas have moved into Second Life. Adidas even sell some of their clothes and shoes through Second Life and Toyota uses Second Life as a showroom for some of their cars (Rymaszewski, et al., 2007). IBM also built a virtual campus on Second Life. They discovered that such platforms can be used for business-oriented round table discussion. They also believe that they can extend relationship building on an existing IBM partnership (IBM, 2010). Sony Ericsson entered Second Life to make an awareness of their product innovations in detail. Specially trained promoter Avatars are even there to answer and help us if we have questions (Sony Ericsson, 2007). Boulos, Hetherington and Wheeler (2007) discussing from medical perspective cited that these virtual worlds can be used to educate people about diseases, to promote public health, to provide first aid education.
Nesson and Nesson (2008) state that there may be some risks also involved in using such virtual worlds. Taking into consideration about Second Life platform they explain that it may involve risks to invest time, effort and money as Linden labs, creators of Second Life may change their administration and plans. Security, privacy should also be considered and analyzed deeply.

In virtual worlds, representations of any space like a university, workspace, city can be replicated with objects like buildings, gardens, bridges, trees, flowers, cars etc. Any person can take up a virtual human form called Avatar. Avatars have an option to change their appearance, fly or move around in Second Life, create objects, visiting virtual spaces, and interact with each other through chat or by speaking through headphones.

Implemented these type of technologies in education may have its own set of influence on the students and teachers. Here in our present study we would like to explore and find how students and teachers perceive learning in virtual environments, by observing them while they are interacting through avatars. Throughout our study we made observations (as participant observer) in its actual setting and conduct interviews with our participants (teacher, students).

1.1 Related Studies

Today, many teachers, researchers and corporations are recognizing that these 3D online spaces act as a legitimate communication media and they make the working environment fun and also help in decreasing the differences between reality and virtuality (Schultze, et al., 2008). In recent years, universities have conducted experiments with the use of virtual 3D worlds for teaching and learning. Virtual 3D worlds are no longer just for the stereotypical geek (Chang, Gütl, Kopeinik, Williams, 2009).

Kluge and Riley (2008) discussed the significances and challenges of virtual worlds. Some of the advantages are, it is possible to emphasize more on students rather than on teachers, saving time and travelling costs, accessibility, active participation. But it also has many problems like hardware problems, creating classes, cost involved in creating a suitable environment etc. Virtual worlds have also been questioned for virtual violence, virtual assault, and sexual harassment. Baker, Wentz and Woods (2009) discussed some advantages and disadvantages of education in Second Life which are described in Table 1.
Table 1: Advantages and disadvantages of educational activities in Second Life (Baker, Wentz and Woods, 2009)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Ability to engage students in interactions with teachers.</td>
<td>2. Technology Issues.</td>
</tr>
<tr>
<td>3. Build a sense of community.</td>
<td>3. Some students may not enjoy it.</td>
</tr>
<tr>
<td>4. Students are exposed to new technology.</td>
<td>4. Class management techniques.</td>
</tr>
<tr>
<td>5. A person feeling shy may be more open.</td>
<td>5. Security.</td>
</tr>
<tr>
<td>6. Teachers and students can do many other activities like attending games,</td>
<td></td>
</tr>
<tr>
<td>museum, concerts etc.</td>
<td></td>
</tr>
</tbody>
</table>

Discussing student’s role in virtual worlds, Kluge and Riley (2008) discussed that some students may find the virtual worlds so engaging that they get easily distracted from the course goals. There is a possibility that they may lack participation and may behave inappropriately towards others.

Baker, Wentz and Woods (2009) suggested some recommendations to the students and teachers in Second Life like “do not send students in to Second Life without some educational objective, be prepared for the unexpected and have a contingency plan, prepare students for the social experience, start small, send students in with a partner, make students your learning partners, spend time in Second Life yourself, connect with other users of Second Life, assess the efficacy of Second Life”.

Many new developments are being made in educational field of virtual learning. Smoodle being the latest upgrade. It can be referred to as open source software where Moodle, a learning management system is implemented in Second Life (Kluge and Riley, 2008).

1.2 Motivation and Research Problem

Usage of virtual worlds in educational purposes is increasing (Stieglitz, Lattemann and Fohr, 2010; Callaghan, et al., 2010; Cliburn and Gross, 2009) and can be considered a new phenomenon. Many educational
institutions ranging from community colleges to large universities are offering virtual learning courses (Kluge and Riley, 2008). So far, studies conducted on virtual worlds were mostly case studies on how courses were conducted in Second Life (Callaghan, et al., 2010; Aydogan, Karaka and Aras, 2010) or about the experiences of the teachers and students. However, "more basic research is needed to investigate how virtual spaces are influencing what we imagine education itself will become" (Jarmon, 2009, p.7). This uncertainty has created the basic motivation for this study.

Virtual worlds for pedagogical situation are trying to combine avatar-based interaction without losing the benefits of education (Andersen, Hristov and
Avatars are not the student's real body, thus the interaction is limited to seeing and listening compared to real life interaction. He or she only sees a motionless group of avatars. Studies showed that non verbal communication is moderately supported in Second Life and learners would like to have more non-verbal cues to be added (Vrellis, et al., 2010). As you can see in the above pictures, the virtual world inhibits the communication between the teacher and students because there is no direct contact. Thus, body language is lost in Second Life classes (Rive, Billinghurst, Thomassen, Lyons, 2008), which is however an important factor in human communication (Dumbravă and Koronka, 2009), therefore influences on the learning have to be expected.

Universities, who are considering using Second Life for courses, need to have a strong research backbone about the impacts of 3D Worlds on perceiving learning as various reasons like avatar based collaboration, general features of Second Life may affect the learning. Though some research was done, the published articles on Second Life may become outdated as this technology is constantly adapting, changing and evolving (Woods, 2010).

1.3 Purpose

As mentioned in the last paragraph, new technologies are emerging and are being used widely by educational institutions. However, even if these new technologies brought a lot of opportunities, they will also influence the users and provide opportunities and challenges (Kluge and Riley, 2008) which may or may not be encouraging in perceiving learning. The main purpose of this study is to examine students and teachers perceptions/understandings, when learning through avatars in 3D environments from their own perspective.

1.4 Research Questions

So relating to the purpose of this study we would like to investigate the following research questions.

(1) How do students and teachers perceive learning through avatar-based interaction in virtual world environments?
2 Background/Theory

This section represents the theories evolving from the literature study regarding virtual worlds in educational context and pedagogy related topics. The aim of this section is to provide descriptive knowledge that will enable a deeper understanding of the empirical findings.

2.1 Virtual World

Virtual worlds are defined as three-dimensional simulations in which avatars can move around and interact with each other by means of integrated text, audio, video and chat tools (Dickey, 2005). Bell (2008) defines a virtual world as “a synchronous, persistent network of people, represented as avatars, facilitated by networked computers.” Moreover, Book (2004) defined virtual world as an immersive, interactive, continual multi-user share space that provides its users the experience of immediate real-time interaction. This can be done for various purposes like socialization, communications, businesses, education, and entertainment, by using their virtual representatives or avatars (Book, 2004). Zhou, et al. (2011) claims that, because of its 3D nature, virtual worlds have acquired an aspect of immersion which gives interactive and immersive experiences that engage its users. They also stated that user’s motivation in using virtual worlds is quite impressive when compared to other worlds like 2D.

Virtual world exists in different forms for various purposes such as social networking, gaming, business institutions, education, research etc. Currently different kinds of virtual world platforms are emerging, such as Second Life, Active Worlds, There, Adobe Atmosphere, OpenSim, Everquest, World of Warcraft, etc and each of these platforms has their own affordances and limitations depending on the context of their use.

Childress and Braswell (2006) demonstrate how virtual worlds engage online students in an environment which allows them to become more involved with each other and the teacher. Sitting around a coffee table in a cyber cafe and conversing in real time with other avatars by making use of generated emotions and specific forced gestures, they have observed social interaction was improved and concluded that, the graphical support of virtual worlds, Second Life in particular, adds a visual feedback element that increases the interaction while exchanging knowledge. These highly social features of virtual worlds make them appropriate environments for cooperative learning activities. Moreover, offering a variety of partner and group activities, they promote critical thinking and problem solving skills of
learners, which indicates cognitive presence in an online learning community (Rourke, Garrison, Anderson and Archer, 1999).

Dillenbourg, et al. (2002), identified that the basic characteristics of virtual environments draw attention to the motivational explicit representations that produce positive attitudes toward the educational environment. In addition they said that learners are not only active, but also actors as it is possible for learners to create objects; therefore, they can be a part of the design process of their own learning environment by becoming “the contributors of the social and information space”. Some characteristics of virtual learning environments are:-

- A virtual learning environment is a designed information space.
- A virtual learning environment can be referred as a social space: Here educational interactions occur in the environment, turning spaces into places.
- The virtual space is explicitly presented: the representation of this information/social space can vary from text to 3D immersive worlds.
- Students are not only active, but also actors: they co-construct the virtual space.
- Virtual learning environments are not confined to distance education: they also enrich classroom activities.
- Virtual learning environments combine heterogeneous technologies and several pedagogical approaches.
- Most of the virtual environments coincide with physical environments.

2.1.1 Second Life

Second Life is a virtual world developed by Linden Labs and was launched on June 23, 2003 to be accessible on the Internet. It’s a free client program which enables users to interact with each other through avatars (Second Life, 2007). Second Life comprises of 3D representations of inhabitant’s and landscapes from the real world. It's an environment where users represent themselves in some form i.e. avatar and they cooperate or communicate with each other by using different methods like instant messaging, chat, voice. Also, inhabitants in Second Life can design their clothing, hair colour, dresses and even can change their appearance etc. through their avatars (Sah and Kanunjna, 2008).
Second Life has created many opportunities for educational institutions. Today, Harvard University, University of Illinois at Chicago, School of Public Health CADE, University of Missouri, Linnaeus University and many more are conducting classes, training programs and workshops in Second Life for students from different parts of the world removing the geographical barriers. As Peachey (2007) stated that Second Life has turned out to be a visually dynamic, stimulating and collaborative environment and as a result they are attracting most of teachers throughout the world (Peachey, 2007).

Education in Second Life is more practical rather than theory, which helps students to practice the lessons they have learned, especially helps them to explore or practice situations which may be hard in the real world class. It also makes them think innovatively. This way of teaching in Second Life is a combination of theory and practice together with uniqueness of the environment (Rive, Billinghurst, Thomassen and Lyons, 2008).

A study by Warburton and Perez-Garcia (2009) identifies the below components of Second Life which facilitate creativity and innovations in academia.

- **Extended/rich interactions:** chances for higher social interaction between individuals, communities, individual with object/artifact interaction.
- **Visualization** and **contextualization:** the fabrication and replica of content that is difficult to get, like historically lost objects/events, too distant (archeological places), too costly (Space), futuristic or impossible to see by the human eye.
- Exposure to valid content and culture.
- Individual and collective identity play.
- **Immersion** in Second Life, a feeling of sense of presence through virtual embodiment in the form of an avatar and wide-ranging modes of communication, which can influence the affective, empathic and motivational aspects of the experience.
- **Simulation:** replica of contexts that can be too costly to reproduce in real life with the advantages such as overcoming some physical constraints etc.
- **Community presence:** “promoting a sense of belonging and purpose that coheres around groups, subcultures and geography.”(Warburton, 2009).
• **Content production:** opportunities for making and possession of the learning environment and objects within it that are both individual and owned (Warburton, 2009).

Teachers can encourage many learning activities in various learning spaces which helps the students to perceive more. Minocha (2010) describes some activities which can be done in various parts of Second Life.

Table 2: Learning Activities and learning Spaces in Second Life (Minocha, 2010)

<table>
<thead>
<tr>
<th>Learning activity</th>
<th>Learning Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lectures, guest speakers</td>
<td>• Lecture theatres (indoors); amphitheatre (outdoors)</td>
</tr>
<tr>
<td>2. Seminars or small group discussions</td>
<td>• Formal or informal areas e.g. Formal chairs and tables.</td>
</tr>
<tr>
<td>3. Teaching design skills</td>
<td>• Sandboxes (Open Spaces)</td>
</tr>
<tr>
<td>4. Virtual field trips</td>
<td>• Meeting point somewhere in Second Life(mostly at the host institution's island) and thereafter visits to topic related islands.</td>
</tr>
<tr>
<td>5. Instructor led, skills based training (negotiation, decision making, communication)</td>
<td>• Simulations of learning spaces to match with the stories.</td>
</tr>
</tbody>
</table>

Describing one disadvantage of Second Life Rive, Billinghurst, Thomassen and Lyons (2008) says that non-verbal communication in Second Life is limited and expressions have to be replicated forcefully by clicking on certain scripted objects. They also say that “all of this behaviour surpasses the thin communication channel afforded by text only; however, it lacks the subtlety, and spontaneity of a face-to-face exchange and is a technical limitation with Second Life”.

2.2 Constructivism

Constructivism is the leading theory in academia which has its roots in philosophy, psychology and other disciplines and its goal is to explain how learners are able to know the world (Glasersfeld, 1989). Sener (1997)
defined the notion of constructivism as: “…an educational philosophy which holds learners to ultimately construct their own knowledge that then resides within them, so that each person's knowledge is as unique as they are.”

According to Mayer's constructivist theory, knowledge is something being dynamically fabricated by humans and knowing is an adaptive practice that organizes the human’s experiential world (Mayer, 1992). Karagiorgi and Symeou (2005) stated that, knowledge for constructivism cannot be transferred intact from the minds of one individual to another. Thus, learning and teaching cannot be identical, so it’s possible to teach in a good way without learners having learned. Jonassen, Peck and Wilson (1999, p. 6) stated that constructivist learning is the idea of learning as meaning making, and negotiation of meaning. According to them, in this knowledge creating society, mutual ideas are established and approved upon i.e. meaning is reflected in the social viewpoint/context which exists at any point in time by this society (Jonassen, Peck and Wilson, 1999).

The basic foundation of constructivist learning is that learners dynamically and actively participate in problem solving as well as in critical thinking. Here learners should feel that learning activity is important and appealing. They should construct their own knowledge by testing ideas and approaches based on their previous understanding's and experiences and apply it to new context. Also they should be able to incorporate the new understanding gained with pre existing academic/intellectual constructs (Kanselaar, 2002).

Karagiorgi and Symeou (2005) described constructivism as: “in the perspectives of constructivism, the center of instruction is the learner. Meaningful understanding occurs when learners develop effective ways to resolve problematic situations.” While learners develop their own views in solving problems, constructivism essentially promotes creative thinking which in turn encourages motivation, since learners get the possibility to face the desire and achievement innate in problem solving (Karagiorgi and Symeou, 2005).

Skaalid (1999) stated that knowledge is constructed by the learners, based on intellectual/mind activity in the view of constructivism theory and further she described that “Learners are considered to be active organisms seeking meaning. Constructions of meaning may initially bear little relationship to reality (as in the naive theories of children), but will become increasing more complex, differentiated and realistic as time goes on.”
Sener (1997) described three basic principles inside constructivism. They are:

i. Situated/ anchored learning: which assumes that the majority of learning is context reliant. Here the learners result in richer and more meaningful learning experiences through activities like cognitive apprenticeships, project based learning, case based learning.

ii. Social negotiation of knowledge: a process through which learners form and test their constructs in a discussion with other learners and with the society.

iii. Collaboration: is a principal which focuses on learning activities so that cooperation and testing of knowledge can occur.

In addition Jonassen (1994) proposed eight characteristics of a constructivist learning environment: These are

- They offer numerous representations of reality.
- Multiple representations avoid simplification and represent the complexity of the real world.
- They give emphasis to knowledge creation instead of knowledge reproduction.
- They emphasize authentic tasks in a meaningful perspective rather than abstract instruction out of perspective.
- They provide learning environments such as real-world settings or case-based learning instead of predetermined sequences of instruction.
- They encourage thoughtful reflection on experience.
- They enable context and content dependent knowledge construction.
- They support collaborative/joint creation of knowledge through social negotiation, not competition among learners for recognition.

Kanselaar (2002) classified the concept of constructivism in two perspectives. First being the social constructivism and second is the cognitive constructivism. Even though both are a part of the constructivism, their view of constructivism is diverse.

Social constructivism (socio-constructivist perspective), is a theory from Lev Vygotsk, which sees the teacher as an active role player in learning because the teacher is the one who assists the learner to develop their mental ability and capacity through discovery. In other words, social
constructivism emphasizes on learning as a social and collaborative activity rather than knowledge being taught or the knowledge which is constructed and interpreted by the learner (Kanselaar, 2002).

On the other hand, cognitive constructivism is individualistic. Here the learner perceives learning as an accomplishment through a range of developmental phases that are constructed upon the previous stage. In other words, the learner builds up understanding through many motivation channels and is improved through integration, adaptation, organization and stability. The development of human intellect proceeds through adaptation and organization. Adaptation is a process of incorporation and accommodation, where, external events are incorporated into thought. New and unusual structures are accommodated into the mind which in turn produces adult mind (Kanselaar, 2002).

Relating to social and cognitive constructivism Cobb (1994) puts differences and concepts of see table below:-

Table 3: Social and Cognitive Constructivism (Cobb, 1994).

<table>
<thead>
<tr>
<th></th>
<th>Socio-cultural Constructivist</th>
<th>Cognitive Constructivist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toughts are analysed</td>
<td>In the individual-in-social -action.</td>
<td>Conceptual processes located in the individual</td>
</tr>
<tr>
<td>Learning is a process of:</td>
<td>Socialisation through community of practice</td>
<td>Active cognitive.</td>
</tr>
<tr>
<td>The main aim is:</td>
<td>Constitution of social and cultural processes by interpreting individuals actively.</td>
<td>The social and cultural basis of personal experience</td>
</tr>
<tr>
<td>Theoretical attention is on:</td>
<td>Social and cultural processes have more importance over individual processes.</td>
<td>Individual processes.</td>
</tr>
<tr>
<td>Focus of analyses:</td>
<td>Individual’s participation in culturally organized practices and face-to-face interactions.</td>
<td>Building models of individual student's conceptual re-organization and by analyses of their joint constitution of the local social situation of development.</td>
</tr>
<tr>
<td>In looking at a classroom, we see:</td>
<td>Socialization in culturally organized practices of schooling.</td>
<td>An evolving micro-culture in which students and teacher are a part.</td>
</tr>
<tr>
<td>When looking at a group, we stress on</td>
<td>Homogeneity of members of established communities.</td>
<td>Heterogeneity and avoid analyses single out pre-given social and cultural practices.</td>
</tr>
</tbody>
</table>
2.3 Cognition

As the name implies the concept of, cognition or cognitive learning has rooted from psychology. Cognition can also be related to other fields like philosophy, linguistics, computer science, mathematics, neuroscience etc. Cognition in general is defined as the process of knowing. To be more specific it is the process of learning, thinking, being aware and judging.

Gielen (2008) described or elaborated cognitive learning in a simple way i.e. “Cognitive learning is the result of listening, watching, touching or experiencing.” This description might seem rather vague and unclear if it is not studied into more deeply. In addition, Gielen (2008) continues: “Cognitive learning is defined as the acquisition of knowledge and skill by mental or cognitive processes – the procedures we have for manipulating information ‘in our heads’. Cognitive processes include creating mental representations of physical objects and events, and other forms of information processing.”

In education or pedagogy, the concept of cognitive learning implies that learner’s experience's and previous knowledge has a considerable impact on new knowledge, as that of constructivist theory. Cognitive learning indicates that, individual’s awareness, thinking, learning and own judgment gives the information a meaning, resulting them to acquire new knowledge.

Moreover Gielen (2008) stresses that cognitive learning enables or helps us “to create and transmit a composite culture that includes symbols, values, beliefs and norms.” This can also be seen from a situated learning perspective emphasizing on the culture, or situated environment, where values have considerable influence on the learner.

According to these theories, learning is not seen as a one-way retrieval of information but it can be seen as forming information by applying previous experience. In other words, these theories support the observable fact that even though the same information was given to two different individuals the type of knowledge resulted is not identical as it is shaped based on individual’s understanding and awareness.

Cunia (2007) describes brief assumptions and principles which are related with cognitive learning. These include (1) the exclusiveness of learners learning processes which means that learners past experiences and knowledge cannot be similar to one another; (2) opposing to earlier beliefs (3) active engagement of learners during a process; (4) an individual’s learning is related to his/her own experiences, as a result of mental associations which are not basically indicated in explicit behavioural changes; (5) and that learning is a process of relating new information to
previously learned information. Cunia (2007) further describes that people manage and organize their own learning and they obtain new information or knowledge easily and they can associate this new knowledge with the one they have already learned.

Grow (1996) presented a model (remembering information from a cognitive perspective) to illustrate the processing of cognitive learning. See the figure below.

The above figure illustrates that, new knowledge comes out first in the form of new information, where this new information is refined and associated with the previous knowledge that the learner already had i.e. experiences that are stored in an individual’s memory. Then after, it will be sent to an elaboration phase to enhance the connection or relation among the newly formed information with that of the previous knowledge or experiences which resided in learner’s mind. After this, comes the elaboration phase where new knowledge is formed in to the learner’s knowledge toolbox resulting this knowledge to be meaningful as well as valuable.

Figure 3: Learning and Remembering Meaningful Information – A Cognitive Model (Grow, 1996)
2.4 Synchronous versus Asynchronous e-learning

Communication in Second Life is different during various circumstances of collaboration, especially in the learning process between students-students and students-teachers.

Zhang, et al. (2004) defined e-learning as a procedure where teaching and learning is done online or virtually through network technologies. They also said that it is arguably one of the most powerful responses to the growing need for education. In addition Holmberg (2005) stated that it’s a mechanism of “delivering education to students who are not physically present”. Instead of being in classrooms, students are able to communicate with their teachers from various places using different online educational facilities like Second Life or other different web applications like Skype, Adobe connect etc. These online communications (virtual communication in our case) for educational purposes comes in two categories, synchronous and asynchronous which are described below. Both synchronous and asynchronous e-learning use internet as a platform for communication and interaction.

**Synchronous e-learning** - is a form of communication between teachers and students in real time by using devices like webcams, microphones etc. Examples of synchronous communications include video conferencing, chat, virtual reality etc (Hrastinski, 2008).

Students and teachers experience synchronous e-learning as more social and find it helpful (Hrastinski, 2008). In synchronous e-learning the major pedagogical assumption is that it motivates communication synchronously and keeps the participants active in the learning process (Leidner and Jarvenpaa, 1995). Hrastinski (2007) claims that this type of communication increases flow of information between students-student and student to teacher as well. Moreover it gives immediate feedback to students when compared to that of asynchronous e-learning.

But, Fåhraeus and Döös (2006) argue that communications like chat, virtual talking using avatars etc. are not as synchronous as that of face-to-face conversations or interaction because people engaged in face-to-face conversations can change their mind in the middle of the conversation after seeing the listener’s facial expressions which is lacking in most of e-learning applications (Fåhraeus and Döös, 2006 cited in Hrastinski, 2007).

**Asynchronous e-learning** - is opposite to synchronous e-learning. Communication among students to students, as well as students to teachers
occurs with some time difference. For example, students can download pre-recorded lecture materials, send messages or emails to their groups and teachers any time (Hrastinski, 2008).

In addition, this type of communication allows students to log on to the system at any time they want, and think about the tasks or comments they were given. Furthermore, students and teachers can reply in a time-flexible way and they will have more time to give appropriate reflections (Palloff and Pratt, 1999; Tuovinen, 2000).

Asynchronous e-learning, is normally facilitated by media like e-mail, forums, blogs, wikis, discussion boards. They help in supporting work relation among students and teachers, even though they are not present online at the same time (Hrastinski, 2008). Many people take online courses due to flexibilities like its asynchronous nature or they can combine their education with personal life like family, work and other commitments (Hrastinski, 2008).

2.5 Usage of Theory

In our research we have presented and used five different theories i.e. virtual world, Second Life, constructivism, cognition and asynchronous vs. synchronous e-learning. These theories can be related to technological, pedagogical, communication aspects. Also relating to our focus i.e. to examine students and teachers perceptions in learning in Second Life, these pedagogical theories in e-learning gave us good insights for investigating this study.

In the later part of this study, the empirical findings were analysed and discussed against these theories. The usage of these theories is explained below.

The theories virtual world and Second Life were used to see how various features of Second Life and virtual world were being used in the best manner to perceive learning. Also these theories helped us to describe the unique characteristics of these environments like recreating real environments, taking an avatar form etc which were later used in our analysis while discussing, how these unique features helped them in understanding more when compared to other traditional and e-learning methods.

The second one is constructivism theory which was used to support our analysis that, usage of constructive methods in teaching in Second Life can increase the understanding of the students.
The third one is the cognition theory. It has been used in analysing our empirical findings to look, identify and get a clear picture of how the knowledge perceived in Second Life helped the students in enhancing their cognitive levels.

Finally, asynchronous vs. synchronous e-learning theory has been used in the analysis to understand how these different types of communication such as offline and online communication are effectively being used by students while communicating during collaboration activities. This theory has also been useful in our analysis to show that best usage of both types of communication can help the students and teachers to perceive more. In addition this theory has also helped in analysing features like lack of body language and its effects on students’ perceptions and understandings.

Over all having used these theories for analyzing our study helped us to get descriptive knowledge that enabled a deeper understanding of the empirical findings as well as to get a concrete result from the study.
3 Method

This section describes the chosen research method and the approach we used in this study. A detailed explanation of the worldview, strategy, research site, participants, data collection etc. have been explained.

The research approach we have adopted for our study is qualitative research. As Creswell (2009) stated, this approach is suitable when there is a need for exploring and understanding the interpretations of individuals or certain groups given to a particular phenomena or a problem. Unlike quantitative research which aims to measure a quantity, the goal of qualitative research is to describe the qualities of a phenomenon under investigation. According to Seale (1999) “the simplest way in which qualitative social research can be defined is in terms of a negative: it is research that does not use numbers.” Qualitative method deals with the aim to investigate participants in their world and help the researchers to get a deep insight and understanding of the phenomena. In qualitative approach there is an assumption that, objects cannot be understood unless the investigator/researcher experiences the situation and observe it in the view of the participants under study (Creswell, 2009). In contrast to that, in quantitative approach, researchers investigate the entities from a distance and observe by not being a part of the study or respondents. Qualitative approach emphasises to get more closeness to the respondent (Holme and Solvang, 1991 cited in Günes, 2008). But being close to the respondents and making interpretations may sometimes lead to error in interpretation making because of not having understood the respondents perception which might lead to failure to answer the aim of phenomena (Holme and Solvang, 1991 cited in Günes, 2008).

Lofland (1971) described four kinds of methodological principles concerning to qualitative methods and research questions (Lofland, 1971 cited in Günes, 2008). These are

- **Proximity to researched entities** – States physical closeness is needed for contacting the individuals and groups in their setting, which creates social closeness and a foundation for mutual trust. Here in our case, we attended all the sessions in Second Life to get a sense of the environment and to get adapted to the setting. Teacher and students were observed while they were involved in
academic activities to get a clear picture of educational settings in Second Life.

- **Accurate rendering of occurrences** – Here investigators should present accurate and pure comments about the events and incidents in a precise manner. In our case we have observed the situation in detail to be able to get brief/accurate information based on our goal.

- **Descriptive clarifications** – Detail explanation of the actions, activities and situation needs to be given in relation to what has been studied. While we were observing we have taken detailed notes to get thick descriptions of the phenomena and also these sessions were recorded to cross examine with field notes.

- **Point-blank citations** – In order to present a sufficient understanding, complete and point-blank verbal and written citations or quotations are required to demonstrate the individual’s own expressions. In our case the interview made with participants was recorded to be able to make citations and quotations by writing down a draft script of the conversation.

Here we choose this approach based on our research problem as well as considering the possible answers for our research question i.e. How do students and teachers perceive learning through avatar-based interaction in virtual world environments? As Creswell (2009) stated, when we try to answer how or what question, it is appropriate to use qualitative approach. Here in our study we tried to investigate how understanding can be affected when courses are offered in a world of avatar based interactions. Since we are mainly focusing on understanding our participants view about virtual worlds like Second Life for learning purposes, using qualitative method is appropriate. Moreover to be able to understand more about our participants by being close to them and making observations while they were engaged in different academic activities in Second Life gave us a deep insight about the phenomenon under study. As Creswell (2009) stated qualitative research helps to develop a holistic picture of the study or issue under study. Hence, we believe that using qualitative approach is appropriate and efficient for identifying and answering our research question as well as to get the deep insight of the phenomena under study in its actual context.

3.1 Philosophical World view

In our study we have adopted a social constructivist worldview throughout the research, because we have investigated, how learning is being perceived
in a constructive way in 3D worlds. Creswell (2009) states social constructivist worldview handles how individuals or objects interact in particular context in their settings that helped in understanding of the participants well.

Here in our study we investigated and understood virtual learning in Linnaeus University (Kalmar) in its real-life settings, by emphasizing participants experiences, interpretations they had. This gave us a deep understanding and viewpoint of the influences of virtual environment on both teachers and students in the learning and teaching process while they are interacting, collaborating in this environment.

3.2 Research Strategy

The strategy of inquiry that we have used for our case is an interpretive case study. Klein and Myers (1999) described that interpretive research helps IS researchers to understand what people think and do in social and organizational contexts about a particular phenomena. This has the capacity to generate deep insight about the phenomena under investigation and they added that, understanding reality is obtained through social constructions such a language, consciousness, shared meanings, documents, tools, and other artefacts. Unlike that of post positivist, an interpretive research does not predefine dependent and independent variables, but focuses on the complexity of human sense making as the situation emerges (Kaplan and Maxwell, 1994). Here it tries to understand the phenomenon based on the meanings people give them (Boland 1985, 1991; Deetz, 1996; Orlikowski and Baroudi, 1991 cited in Klein and Myers, 1999).

Using interpretive research in our investigation helped us to understand the phenomena through the meanings that our participants gave in our context. Here in our study we believe that using interpretive case study is appropriate since we are concerned to understand, how students and teachers perceive learning through avatar based interactions in virtual world environments like Second Life and also, the factors that influence them in using Second Life for learning purposes in its actual context. Being able to observe the phenomenon helped us to interpret the meanings that our participants gave us.

Further Yin (1989) claims that case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context using multiple sources of evidence. In our study, learning in virtual world of Second Life is a new phenomenon which can influence and be helpful to academic institutions, learners and researchers. To be able to get a broader
picture of influences of learning in Second Life, we have observed our participants while they are engaged in Second Life and we have made interviews with them to get different views they had in relation with our research problem.

According to Yin (1984) there are three types of case study research i.e. exploratory, descriptive, and explanatory. Defining descriptive case study he says it is an attempt to describe what happen to a particular phenomenon when it is launched and factors/influences associated with it. In this sense we mostly made observations in Second Life and making a description of what we have observed for our report helped us to know our participants especially what they feel about Second Life or perceive by using this avatar based learning platform for learning purposes.

Yin (1984) stated two kinds of case studies, single case study and multiple case study. In our case our focus was on distinctive events of learning in virtual world of Second Life and Linnaeus University(Kalmar) being the only university in Sweden to offer such course we have used a single case study. Furthermore, it would make our research smooth as it was easier for us to contact them. Moreover using single case study helped us to explore in depth about this phenomenon. We justify our usage of single case study as Tellis (1997) says that a single case study can be acceptable if it meets the established objective. Also, Yin (1994) suggested that generalization of results from either single or multiple case studies are made into theory and not to populations.

3.3 Research Site and Participants

Linnaeus University (Kalmar) in collaboration with University of Central Missouri (USA) and University of Molde (Norway) is offering virtual teaching in courses like business talking using a platform called Second Life. Together, the three universities built their own virtual island in Second Life, called Kamimo, which they utilize as a virtual classroom (University of Molde, 2007). This course mainly emphasizes students to practice technical and administrative presentations in English and to take part in formal and informal discussions with feedback from the teacher (Linnaeus University, 2010). Kamimo project was mainly initiated with two goals. The first being to test and evaluate how the selected virtual environment i.e. Second Life is good as a learning platform and second to test some learning tools in virtual environment and to investigate if they are suitable for social interaction between people in academia, business life and students (Kamimo Islands, 2007). Kamimo project also has evaluation goals like
identifying teaching and design elements used in Second Life and also to assess how these elements show impact on positive cognitive outcomes in Learning (Kamimo Islands, 2007).

Before the course starts students are given a link to the course site to get a complete view of instructions like the schedule, course structure, technical guidelines like how to download Second Life (SL), system requirements etc. A series of videos are posted about the basics of Second Life on how to move around (walk, fly, run etc), to speak, how to search for places, how to teleport, how to save landmarks etc. These videos are posted by the teacher of the course to give a clear and brief idea to the students about the virtual environment. For students with technical problems with Second Life, the university provides a facility where a test avatar can be used to check if their computer can actually function well with Second Life and also can help with the problems caused in creating an avatar.

The teacher also gives the students a link to a blog maintained by him. The blog mentions the daily activities done through the course and this helps the students to get a brief idea about the course structure and daily activities.

Kamimo Island has a welcome area, a classroom and places like a campfire, waterfall, sandbox, play area etc. Students are free to move around and explore the world by participating in activities like playing soccer, diving, creating objects in the sandbox etc. They are independent to take any avatar form. The course starts with a kickoff meeting at the welcome area one week prior to the actual date to make the students get adapted to the environment. During the kickoff meetings, students of Linnaeus University are paired up with the US students. The US students have to interview the Linnaeus university students for their course (in US) and also give their student partners a tour around Second Life to make them familiar to the environment. The main aim for assigning a US buddy is to acquaint them with an English speaking mentor (Petrakou, 2009).

![Figure 4: Kickoff meeting held at the welcome area.](image-url)
Classes take place at a location Peer Gynt Rotunda which replicates a classroom with chairs, white board etc. but sometimes discussions are made in an informal setting around a campfire. Presentations can be given by teacher and students on the whiteboard. Students are required to send their files to the teacher prior to the presentation. The course is designed to have five sessions each of 2 hours. The first two are like practise sessions where students are given tips on how to present themselves and how to talk and participate in informal discussions. The actual task for these sessions was to make the students practise levels of formality, active listening, interrupting formally, to formulate questions and comments for others, tips for making presentations etc. The later three meetings are the sessions where tasks have to be performed by the students based on which they were graded. These meetings have general interactive lectures, group tasks, presentations, role-plays’ etc. Emphasis is given on how to talk in business environments and even minute points like pronunciation, grammar are considered here and students are given feedback.

Students can communicate either by chat which can be seen by other participants or by talking to other virtual avatars with a headset or note cards. A private message can also be sent to specific persons. All chat can be logged for future reference. Instant messages are also delivered online to the email if the participant is not online. During these interactive sessions teacher also gives suggestions to students. Due to time differences and more students enrolled in the course, same session is done three times so students have more options to attend the classes.

Figure 5: A lecture at Peer Gynt Rotunda in virtual setting and informal discussion around a campfire.
To help the students not to lose track of the course a podcast (i.e. series of audio recordings) is also posted on the course website after each class to give a brief overview of what happened in the last session.

Participants in this study were the teacher and students from this course. A total of 50 students were enrolled in this course. All the students were initially contacted through emails explaining the purpose and objective of our research. Depending on their response, we have interviewed 5 students along with one teacher of the course. Here convenience sampling i.e. a selection involving the most accessible subjects was used in selecting our participants, due to two reasons. First being the low response rate from the students who were willing to participate in our study and second is the less availability of time.

The participants were 3 females and 3 males of which 5 were students and 1 was teacher. The student participants came from different backgrounds like China, Sweden, Nigeria and Italy. Discussing their educational background most of the student participants were doing there Masters or Bachelors in computer science, business marketing, communication media etc. Since this was an online course, the students were accessing Second Life from different geographic locations like Sweden, China, Italy, Nigeria etc. Most of our student participants took up this course as they wanted to improve their English skills. All of them did not have any prior experience with Second Life and for most of them; this was the first online course they have taken.

The teacher of the course Mr. David Richardson is a teacher in Linnaeus University who has been working with virtual words for more than 6 years. He uses various ICT technologies like Skype, Adobe Connect, for educational purposes.

A brief explanation about the characteristics of participants like nationality, educations etc. were given so that the readers can have a clear picture about them. Technical aspects like expertise in computer usage, Internet accessibility, computer capacity, experience in e-learning were asked as they were helpful in formulating further questions in our semi structure interview. For example the usability of Second Life may vary depending on these technical factors as the person with good computer usage skills, faster Internet may find it easier than others. In some cases it was easier to ask our participants to compare other e-learning methods with Second Life if they had prior experience with other courses through distant education.
Table 4: Characteristics of the Participants.

<table>
<thead>
<tr>
<th>No</th>
<th>Name of the Participant</th>
<th>Age</th>
<th>Gender</th>
<th>Nationality</th>
<th>Geographic Location for accessing Second Life</th>
<th>Educational Background</th>
<th>Expertise in computer usage</th>
<th>Internet Accessibility</th>
<th>Computer capacity</th>
<th>Experience in e-learning distance education</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anna-Sara Johansson</td>
<td>23</td>
<td>F</td>
<td>Swedish</td>
<td>Vaxjo, Sweden</td>
<td>Student of media and communication</td>
<td>Very Good</td>
<td>Medium</td>
<td>Medium</td>
<td>No prior experience</td>
</tr>
<tr>
<td>2</td>
<td>Fidelis Aidelomon</td>
<td>26</td>
<td>M</td>
<td>Nigerian</td>
<td>Abuja, Nigeria</td>
<td>IT student</td>
<td>Very Good</td>
<td>Average</td>
<td>Fast</td>
<td>No prior experience</td>
</tr>
<tr>
<td>3</td>
<td>He Maoqi</td>
<td>30</td>
<td>M</td>
<td>Chinese</td>
<td>Shanghai, China</td>
<td>Masters degree in Computer embedded system</td>
<td>Very Good</td>
<td>Good</td>
<td>Fast</td>
<td>No prior experience</td>
</tr>
<tr>
<td>4</td>
<td>Ai Xu</td>
<td>23</td>
<td>F</td>
<td>Chinese</td>
<td>Vaxjo, Sweden</td>
<td>Masters degree in marketing</td>
<td>Average</td>
<td>Fast</td>
<td>Fast</td>
<td>No prior experience</td>
</tr>
<tr>
<td>5</td>
<td>Valentina Pigoli</td>
<td>24</td>
<td>F</td>
<td>Italian</td>
<td>Kalmar, Sweden</td>
<td>Bachelor degree in Economics</td>
<td>Good</td>
<td>Medium</td>
<td>Slow</td>
<td>No prior experience</td>
</tr>
<tr>
<td>6</td>
<td>David Richardson (Teacher)</td>
<td>M</td>
<td>British</td>
<td>British</td>
<td>Kalmar, Sweden</td>
<td>-</td>
<td>Very Good</td>
<td>Fast</td>
<td>Fast</td>
<td>More than 6 years of teaching in Second Life</td>
</tr>
</tbody>
</table>

3.4 Data Collection

Observations and interviews were used as data collection procedures.

3.4.1 Observations

Observations in qualitative study, is very important with respect to the phenomenon under study. Saunders, Lewis and Thornhill (2007) describe that observations are a neglected aspect of research. But, in reality observations are very rewarding and add to the richness of the study.

Holme and Solvang (1991, cited in Günes, 2008) stated observations as “to observe, as a mundane, day-to-day operation in the field, is to orient one’s consciousness and one’s actions explicitly to look, to listen, and to ask ‘what’s happening.’ It is to ask one’s self: What is the order in, or ‘meaning of’, what’s happening? (Lofland, 1971)”. Holme and Solvang (1991, cited in Günes, 2008) stated that observations can come in two forms. An open form and a closed form. In open observations, the
researched entities are informed or notified and they accept for being observed. Where as in closed observations the researcher does not get in direct contact with entities under study and they may not know that the research is taking place. In our study all the participants were informed about the research and our presence, and they also accepted for being observed.

Creswell (2009) identified four observation types which are complete participant, Observer as a participant (Participant observer), participant as observer and complete observer. In our study we played the role of participant observers. Maykut and Morehouse (1994) defines participant observation as a broad focus of inquiry and an ongoing process of observing and participating in the actual settings and it involves recordings what he/she sees and hears.

As participant observers, we sat during the classes and observed the teaching process and also how students were learning collaboratively. During our presence we saw the students were involved in listening to the teacher, participating in group discussions/role plays, giving presentations and teacher can be seen guiding the students academically and also helping them with technical problems. Other observations like how the teacher has to keep the group focused, how students appear/disappear suddenly due to technical problems, students behaviour in virtual life were be observed. All the five course sessions on Second Life were recorded using screen recording software called Camtasia Studio 7.0. These recordings were further used to observe the behaviour of the participants like how they are interacting with each other and how unable to gesture or use body language puts people in confusion while responding etc. The advantage of these recordings are they helped us to capture their movements more specifically and also helped us to notice things more carefully that we might have missed during observations due to improper attention.

But one weakness as participant observers is that sometimes it may be disturbing for the teacher/students for someone standing around and watching them. It can be distracting when observers are flying around which, is a feature supported in Second Life.

3.4.2 Semi Structured Interview

Interviews help us gather suitable as well as consistent data that are important to our research questions and goals (Saunders, Lewis and Thornhill, 2007). They can be categorized into (1) Structured interviews where questions are predefined and the interview is limited to them (2)
Semi structured in rearview where a list of themes and questions are be covered (3) Unstructured interview where no prearranged list of questions are present apart from having the idea of what you want to know in specific context. In our study we used semi structured interviews. Holme and Solvang (1997, cited in Günes, 2008) stated “Semi-structured interviews will enable adaption to each respondent and interview setting, by allowing us to: change formulations of the questions, reorder them, and follow up with new questions if needed. A problem with a less structured approach is the increased difficulty of carrying out the analysis due to the complexity of the information gathered”.

These interviews were conducted face to face, through telephone, Skype or by meeting in Second Life (we spoke to them in virtual worlds through a microphone) about how do they find this gained knowledge in real world, are they able to perform same as in virtual worlds, about their experiences, any security or privacy issues they found, how teacher can evaluate students performance based on their virtual performance, how are they overcoming the disadvantage of lacking body language etc. Each Interview started with a statement ensuring confidentiality and lasted for 35 to 40 minutes. These were recorded and transcribed later. These interviews were one-on-one interviews where each participant was interviewed separately and the advantage was that it brings out the views and opinions easily (Creswell, 2009, p.181).

Some weaknesses which were taken care was not to ask leading questions, not to repeat the questions and not to judge the participants answers.

3.4.3 Websites

The course website and the blog maintained by the teacher were also helpful in gathering the data to some extent.

The website [http://www.flexlearning.se/englishcourses/bt/index.htm](http://www.flexlearning.se/englishcourses/bt/index.htm) helped us to get a brief view on the course. The data about the time schedules, the activities they were planning in each session, the procedures for assessments were mentioned here.

The teacher also maintains a blog ([http://op2008research.blogspot.com/](http://op2008research.blogspot.com/) ) which was a part of a research project in 2008. The blog mainly mentions the experiences, daily activities of the teacher. Even though it only mentions the activities done in 2008 it helped us to have a pre-image of the course as the same structure is being followed till date. Through this blog we came to know about the activities the teacher did to run this course
smoothly, the problems he faced, the procedures and also about the other things related to the course happening in between the sessions.

3.5 Data Analysis and Validation

As discussed in the previous section qualitative study was conducted through observation and in depth interviews with participants in relation to our research problem.

The raw data we obtained from interviews and observations were analyzed by organizing and transcribing it. Then the data was read thoroughly and categorized into different categories, themes to find patterns. Regarding validity we have tried to use multiple strategies in our study to be able to ensure our internal validity of our findings and to produce a precise and acceptable result. We have used the following strategies throughout the study which were mentioned by Creswell (2009):

• Using multiple data sources like interviews with participants, observations and other sources like the blog maintained by the teacher, course website etc, made our study feasible. And also these multiple data sources helped us to compare and evaluate results which are crucial for validity.
• After transcription of all data we conducted some follow-up interviews to make sure that whether the transcription is similar with what the participants have said.
• Member checking strategy has been used i.e. after we have finished the findings we have send to some of the participants to check the accuracy of our findings.

This study took twenty weeks in order to complete the following tasks:
(1) Conduct a literature review and complete the introduction.
(2) Develop questions for interviews that are connected to the research questions
(3) Adjust and conduct interviews with the participants to collect data for the study.
(4) Interpret the results and compose them in the research article.
(5) Finalize the conclusion section of the study and review the thesis.
3.6 Researchers Role

As described earlier we conducted qualitative study focusing mainly in-depth interviews and observation of participants through Second Life in its actual setting. We as researchers mostly interpreted and analyzed the data that we have gathered through interviews, observation (observer participant in virtual learning) and through field. Moreover, being able to participate as a participant observer helped us to get a deep understanding of the phenomenon under investigation (Creswell, 2009).

3.7 Ethical Issues

All the participants have been given brief information about the research purpose and objectives. Necessary credentials were shown to the participants to be transparent. As we have discussed earlier a voice recorder was used and interviewees were asked whether they were convenient in using it. After transcription of the interview, report of the transcription has been sent back to them to avoid discrepancy i.e. to ensure that whether the transcription is similar with what they have stated and also all information related to them was kept confidential, if asked for. All the participants were informed that these interviews are flexible and they could withdraw from them anytime.
4 Empirical Findings

This section contains the observations made in Second Life and also the data collected through interviews from students and teacher.

Here the empirical findings were discussed based on observations and interviews. The teacher and students of Kamimo Island, Second Life were observed and to support our observations we made interviews with our participants.

4.1 Observations

Five sessions of the course were observed and Table 5 explains more details about each session. The details include the location of the session in Second Life, the activities they did and the timings of each session.

Observations were made based on the characteristics of the students and teacher which was derived from the theoretical framework i.e. the four themes (Second Life theme, Constructivism theme, Cognition theme and Asynchronous vs Synchronous theme).

The first column of Table 6 is the characteristics against which we analyzed students’ perception in learning process. For each characteristic observed we have rated our level of observation as 'well observed' or 'somehow'. For instance if a particular characteristic was observed appropriately and we got good insights, it was labelled as 'well observed'. But for the characteristics which were observed and needed to be explained more or confirmed in interviews we have labelled it as 'somehow'. In addition we have discussed about the devices used and overall comments about the events observed which would help our readers to get understanding of how the observation was done by the researchers. Similarly the protocol for the teacher was also done as shown in Table 7.
Table 5: Details of sessions observed.

<table>
<thead>
<tr>
<th>Session Number</th>
<th>Location of the session in Second Life</th>
<th>Activities done during this session</th>
<th>Time of session</th>
</tr>
</thead>
</table>
| 1              | Peer Gynt Rotunda, Kamimo Island.      | - In the first session the teacher makes the students to practise the level of formalities and how to be polite while speaking. They also practised on how to interrupt politely.  
|                |                                        | - Other exercises which continued included active listening, tips and hints to make good presentations and finally the teacher explains the features and benefits in making a good presentation | 16th February, 3.00 pm - 5.00 pm CET  
|                |                                        |                                    | 16th February, 6.30 pm - 8.30 pm CET  
|                |                                        |                                    | 17th February, 6.30 pm - 8.30 pm CET  |
| 2              | Peer Gynt Rotunda, Kamimo Island.      | - In the second session they mainly focused on three activities.  
|                |                                        | - First was a exercise to encourage active listening. The teacher starts with five stories of his real life and students have to react accordingly and pick out a story among the five which seemed to be unreal.  
|                |                                        | - Second the students made presentations on the things they found in Second Life. They were asked to explore around Second Life the before week and present it to the class. Some explained how they went to amusement park or enjoyed the beach etc.  
|                |                                        | - Third they practised some roleplays. | 2nd March, 3.00 pm - 5.00 pm CET  
|                |                                        |                                    | 2nd March, 6.30 pm - 8.30 pm CET  
|                |                                        |                                    | 3rd March, 6.30 pm - 8.30 pm CET  |
| 3              | Peer Gynt Rotunda, Kamimo Island.      | - In the third session they practised an exercise where the teacher would give some outrageous opinions on a topic. The students should then agree or disagree quickly and politely.  
|                |                                        | - In the second part of the session they practised some roleplays. | 16th March, 3.00 pm - 5.00 pm CET  
|                |                                        |                                    | 16th March, 6.30 pm - 8.30 pm CET  
|                |                                        |                                    | 17th March, 6.30 pm - 8.30 pm CET  |
| 4              | Peer Gynt Rotunda, Kamimo Island.      | - In this session they practised the outrageous opinions again and in the latter part of the session group presentations were performed. | 30th March, 3.00 pm - 5.00 pm CET  
|                |                                        |                                    | 30th March, 6.30 pm - 8.30 pm CET  
|                |                                        |                                    | 31st March, 6.30 pm - 8.30 pm CET  |
| 5              | Peer Gynt Rotunda, Kamimo Island.      | - In this session, group presentations were performed on topics selected by the students and later the teacher and the other groups would give constructive feedback. Some students spoke about the stereotypes about their countries, some about their cultures. | 13th April, 3.00 pm - 5.00 pm CET  
|                |                                        |                                    | 13th April, 6.30 pm - 8.30 pm CET  
|                |                                        |                                    | 14th April, 6.30 pm - 8.30 pm CET  |
### Student Observation

Table 6: Observation Protocol for Students.

<table>
<thead>
<tr>
<th>Student Characteristics</th>
<th>Were events in Sessions observed?</th>
<th>Devices Used</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students participations in the lectures</td>
<td>Well observed</td>
<td>Audio devices like headset, Monitor and PPT slides using presentation board.</td>
<td>- All the students were involved in two way communication with teacher as well as with other students using their monitor and headsets for participating in the sessions. They used to actively participate in the sessions by giving presentations and performing tasks well. They also used to give feedback to their fellow colleagues.</td>
</tr>
<tr>
<td>Students use of resources in SL (Second Life Theme)</td>
<td>Well observed</td>
<td>Headset, Computers and Second Life environment</td>
<td>- They made use of the resources to a complete extent. Like they were dressed in different costumes, visited virtual spaces etc. They faced some minor problems with sound, bandwidth and some technical difficulties. But then they used to use chat, messaging to communicate.</td>
</tr>
<tr>
<td>Students interaction and collaboration while performing tasks (Construction Theme)</td>
<td>Well observed</td>
<td>Headset, Computer and Second Life applications</td>
<td>- Starting from introduction there was limited amount of interaction between students like introducing each other, going to some virtual places etc. - But it was observed in the later sessions they were doing group tasks, discussions, sharing experiences etc in different spots of Second Life in collaborative way. They were working in groups in an effective way.</td>
</tr>
<tr>
<td>Students getting the course objectives or new knowledge (Cognition Theme)</td>
<td>Some how</td>
<td>-</td>
<td>- Except the first session which was mainly dealt with the usage of the environment i.e. Second Life, they were involved with concentration and performed well in their tasks.  - However, it was difficult to judge when compared to the real world class since there were some features which were lacking in Second Life like body language, gestures as they are important in understanding other students.</td>
</tr>
<tr>
<td>Difficulties while attending the courses such as technical (Second Life Theme)</td>
<td>Well observed</td>
<td>Headset, Computer and Second Life applications</td>
<td>- In the first few sessions some problems have been observed like sound problems (headset), connection problems (bandwidth) etc. Problems also arised as some students were trying to use computers which were not compatible to this application. - Some students were unable to manage their avatars since they were new to the environment resulting in distraction in the class.</td>
</tr>
</tbody>
</table>

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## Teacher Observation

Table 7: Observation Protocol for Teacher.

<table>
<thead>
<tr>
<th>Teacher Characteristics</th>
<th>Were events in Sessions observed?</th>
<th>Devices Used</th>
<th>Comments</th>
</tr>
</thead>
</table>
| The teacher inspired the students to be active in the course | Well observed | - Audio devices like head set, Monitor and PPT slides using presentation board.  
- In addition e-mails, podcasts, blogs was used. | - Through out the course process the teacher made the students actively participate in the course by giving encouragement and also inspiration. He made good pedagogical decisions and always maintained a calm environment. Real time two-way communication was used with students for these purposes. Of course other type of communication were also used like e-mails, podcasts, blogs for announcements etc. |
| The teacher gave the students an awareness of Second Life environment and also how to use them with respect to the course. | Well observed | Devices like head set and Computer were used. | - During the first two sessions the teacher gave his students detailed clarifications of the Second Life environment particularly Kamimo Island and how to operate and access the environment through the course.  
- The teacher also made the students explore in groups to get adapted to the environment.  
- Also the teacher posted some videos and shared his experiences through a blog on how to use Second Life. |
| The teacher made the students interact and collaborate in doing their work tasks | Well observed | Audio devices like head set, Monitor and PPT slides using presentation board | - The teacher made the students interact (get to know each other) and learn from each other and helped them in performing tasks like group discussions, assignments collaboratively. |
| The teacher used the resources (features) available in Second Life to conduct the sessions well. | Well observed | Headset, Computer and Second Life applications(all features necessary for the course) | - We have observed that the teacher used all available resources (features) in Second Life like audio devices, teleport, flying, various virtual spaces etc to make the students feel comfortable and less pressurised. |
| The teacher tried to give the students the knowledge expected from the course in interactive way as compared to real world. | Well observed | Headset, Computer and Second Life applications(all features necessary for the course) | - The course was conducted based on the objectives of the course and the teacher can be seen giving lectures, asking questions, making students to interact in the sessions by calling their names personally, giving assignments to be done in groups and also encouraging them to present their tasks and giving them constructive feedback. |
| The teacher found difficulties while conducting the course. | Some how | - | - As we have observed most of the difficulties the teacher has faced were technical like unable to hear the students, internet problems, in the beginning of the course the students avatars became out of control disrupting the sessions, time wasted in dealing with these problems. However as time went these problems were somehow resolved.  
- As we have observed evaluating students based on the virtual performance is somehow difficult since it was difficult to identify the authenticity of the student.  
- During a session where students have to reply to the teacher to show their interest in the conversation by replying it became very confusing for the students to understand if it was a technical problem that the teacher paused in the lecture or the teacher wants them to reply. This can be related to lack of body language or expressions from the teacher’s side. |
4.2 Interviews

The interview questions (Appendix 2 and Appendix 3) were derived from the theoretical framework which is available in Section 2 of this thesis. We have categorized these questions into five different categories or themes i.e. Second Life theme, Constructivism theme, Cognition theme, Synchronous and asynchronous Theme and General. The questions under general theme were asked to know the general views of some issues which we expected might have affected in perceiving learning.

Here we have summarized each interview with participants.

Participant 1

Discussing the usability she was telling it was complicated in the beginning of the course like finding the correct place in Second Life, managing the general settings, microphone, etc. But the videos posted by the teachers were very helpful. She also said that, she had problems with computer graphics, bandwidth and it was always difficult for her to install the Second Life program on other persons or general computers when she was not able to use her personal computer.

“That was my main problem in this course since my computer was slow, poor graphics... when I was travelling I find it difficult to install and run the application to follow the sessions...”

For her it was fun to see other people dressed up in different costumes and it doesn't have any effect on her learning. She further described that she was comfortable in seeing herself in an avatar and interacting with other avatars. She felt partially real as she could hear person’s voices but could not see them. But to make this experience more real she felt that real time images through webcam can be helpful.

“It is always real as you can hear persons voices but also feels more real if to see the real person through a web cam instead of avatar.”

“It was hard to hear what people were saying”

Collaboration activities enhanced her learning as she was able to meet many people of different nationalities, backgrounds, accents etc.
“... it was very interesting to meet many people. Learned a lot from each other since they are from different backgrounds, nationalities, accents”

Discussing learning through Avatars in Second Life does not have much significant impact in relationship/interaction between students since it’s impossible to see the person talking behind the avatar and no real life communication was there after the class as she claimed.

“It’s hard to as no body language is there we just see avatars standing still so it’s pretty dull”

“It’s harder to create a real friendship because unable to talk after a lesson”

“you don’t get a real picture we just see a avatar its hard to see a real person behind avatar.”

Group discussions, virtual field trips enhanced her learning as she was able to meet and see different persons and places which she would not have done in real life. She felt that the knowledge she got from learning in Second Life, positively affected her real life in terms of confidence and giving presentations and also increased her cognition levels.

“I would say yes, it’s not that I was not confident before but during the course to get advices during discussion on how to do it and what to improve ... helped me to improve my confidence”.

As far as Second Life expertise is concerned she described that not having experience of using such an environment had some minor impacts such as encountering problems with managing the application at the beginning of the class, which were later resolved. She further stated that she got the course objectives that she expected and it was interactive. Discussing the usage of asynchronous form of communication in the course, she communicated with the teacher through e-mails to clarify her doubts.

“Yes we have good information about the subject. if we had any questions we send e-mails to the teacher to get clarifications.... It was easy to understand the course content”.

Regarding the role of teacher’s emails with feedback, pod-casts, blogs she discussed that they were very helpful, especially when the teacher gives her
a detailed categorised feedback on how to improve things like grammar, speaking skills etc.

“Yes the use of these tools, for communications was very useful for me especially when I receive the feedback e-mail from the teacher which he sends us based on the categories on what we have to improve……”

Concerning informal communication like clarifying questions, discussion about assignments with group mates etc she preferred using e-mails and Skype than avatar based communication in Second Life. In the beginning, it was harder to access pod-casts and blogs but later with the help of the teacher she was able to access information about a missed class or some details given during class. As far as lack of body language is concerned, she described that it has a great impact on learning

“During the session I had, we supposed to speak or describe about an event in front of the whole class, its very hard that they do not see you because you want to express yourself more than just voice”

And finally describing the difficulties she explains about the technical problems, problem in finding information about the course and lack of body language and physical presence.

“... did not get any real information about how my classmates, teacher were... you really can’t see there body language and their real presence. ”

“It’s definitely harder to have a lesson just in Second Life. It’s more difficult to have a closer contact with students and teachers.”

At the end, she discussed about the benefits of learning in Second Life she believes that it is advantageous for some persons who are afraid to speak in public as it’s easier for them to speak through Avatars and they can overcome their shyness. The second benefit she mentioned was that, it was nice to get new knowledge and learn in a new ways of learning. Such educational practices are more fun with less pressure when compared to real life classrooms.
**Participant 2**

Discussing the usability of Second Life he stated that he found it easy except the first session where he had problems with installation and managing Second Life application. Discussing technological factors like bandwidth, computer performance etc. he said that the only part where he faced problem was with the network in the city from where he was accessing Second Life. Apart from this he didn't face any problems. Furthermore explaining about the student’s costumes or clothing in different forms, he says that it doesn't have significant impact on him and he became familiar with it. Concerning collaboration activities, he said that collaboration activities between students can positively enhance learning in Second Life as they were able to communicate with many students from different countries and cultural back grounds.

“We had collaboration activities with US buddies and students from different parts of the worlds with different back grounds ... yes it does enhance learning .......”

He added that learning through avatars in Second Life has an impact on relationship/interaction between students and he established good relations with some students from other countries.

“I think it does increase students capability because I got some friends after coming to Second Life which helped me to exposed to new people and new way of sharing ideas .... Not only that between countries and continents ....”

Since he did not have any experience in talking and interacting with the people in Europe he now feels confident because he took up this course and was able to talk and interact with them which in turn enhanced his performance and increased his cognitive levels.

Previously he had experience of 3D worlds, so it helped him to get adapted to the Second Life environment easily.

While talking about understanding of the course content or learning in Second Life when compared to the real world he claimed that it was understandable and enjoyable, but he missed certain features like body language. In his opinion lack of body language in Second Life has some
effect on learning in some aspects and suggested that integrating live images would be great to enhance this learning in Second Life.

“In Second Life you can’t see your lecturer and students … no facial expression while the lecturer was teaching … I think Second Life can have like live image would be better for learning effectively ...”

Concerning the role of teacher’s emails with feedback, pod-casts, blogs maintained by the teacher over the normal chat or voice communication, he discussed that he felt convenient and effective if feed back was through emails.

While communicating with students and teacher during group tasks and other things he preferred avatar based communication in Second Life rather than communicating through e-mails.

“Using e-mails for communicating with students and teachers ok for me but I prefer and discuses mostly in Second Life”

According to him interaction in Second Life has an effect on student engagement in classes The main advantage he got through this course was he was able to learn to communicate with Europeans and other country people and he has taken up a course in Europe without actually being there.

Participant 3

Regarding the usability of Second Life and Avatars based interaction, he found it usable since he got enough materials like videos, instructions etc from the teacher and as a result he was able to use Second Life efficiently. Technological factors like bandwidth, computer performance, Internet access were not a problem for him except the first session where he faced some technical problems, which were solved later with the help of the teacher.

“I think I faced some minor problems at the beginning of the course for instance I am unable to log on to Second Life, problem with sound but the guidance of the teacher helped me to solve these problems and did not happen in the later sessions”.

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He described that when students or teachers are dressed up in different costumes it doesn't have much influence on his attention. It may be affecting in the beginning but it’s easier to become familiar with such things.

“*I think this does not have much problem, after you saw them in different costumes first time, then next time they show up you will not consider their costumes much ...*”

In his opinion at the beginning of the course it’s not much comfortable in avatar based communication, but when the class went on it became comfortable and interesting for him as they get to do classroom activities in interesting spaces like a campfire or beside a waterfall. He further mentioned since these spaces are very soothing and relaxing it was easy for him to perceive more. While communicating with students and teachers he found it real except he was unable to watch them physically in person. As he claimed that this avatar based learning in Second Life has weak social interaction as compared to the real world class which has an impact on student’s learning.

“*I think in Second Life, the social interaction is very weak since you don’t see each other physically, when the class finished everybody become offline but in the real life its strong you can see each other and talk ......*”

Virtual field trips, role plays, and small group discussions with students about their work had some positive impacts on his learning.

“*Yes of course it increases learning capability since you discuss and share ideas with other students about presentations you have to made or the task you perform together ......*”

As he mentioned even though he got experience of dealing and communicating with his job colleagues from different parts of world in English the knowledge he got from learning in Second Life has improved his capability in a good way. Having experience of 3D worlds will ease usage of avatars and learning in Second Life.

“*I think if you have experience of 3D worlds you will have better knowledge to manage Second Life and your avatar ....*”
The students can easily get the course content and objectives since the teacher gave him all the instructions. The course fulfilled his expectations but he faced minor problems in understanding other students because of their accent and speaking styles since they are from different countries.

Concerning role of emails, pod-casts, blogs for announcement and feedback by the teacher, he found it effective and also stated that he would prefer using e-mails for clarifications of the questions with the teacher as well as for discussing about group tasks with the students.

“Usually I prefer to communicate with the teachers and students offline through e-mails because it’s difficult to book time to meet in Second Life since some might be in work or busy...”

Learning in avatar based interaction in Second Life engaged him more but he found it was important to be always concentrated as it was hard to understand other people’s intentions since facial expression and body language were missing.

“.... everybody is quite concentrated while learning in Second Life because you cannot see each other or facial expressions, you don’t know what others are doing .....”

Further he discussed that lack of body language in Second Life has its own impact on learning.

“Yes sometimes lack of body language has limitations on students learning but it depends of the type of course you are taking in Second Life ...”

Finally he mentioned that the benefits he got from this course in Second Life was that he came to know new ways of learning which he found useful and the other thing he found it economical and helped him to get international exposure.

“You need not to go to Sweden to take the course.”

Participant 4

As she described about the usability of Second Life, she mentioned it was harder when compared to other 3D online games but this did not have any direct impact on her learning.
“Compared to other online 3D worlds, Second Life is not easy to control and manage, especially controlling avatars are not easy but I got used to it and it did not affect my learning...”

Concerning technological factors like bandwidth, computer performance she mentioned that she did not encounter any problems during the course and everything went well. When other student’s avatars are dressed up in different costumes like dragon, bird it affected her attention in the beginning but then she got adapted it.

“... Yes at the time when avatar that dressed up in different costumes appeared, it will take my attention but later it will be fine ...”

She said that it feels comfortable in avatar based communication, but it was important that she always have to be alert if others understand her. As she stated, while she was interacting with avatars she found it artificial when compared to real interaction.

“It’s hard to say that they designed the Second Life in the same way of real world. They just tried to simulate the real world in more animated way but it’s more artificial ...”

Discussing about collaboration activities like interacting with other students as well as with US students, problem solving role plays, she mentioned that it did raise her learning capabilities and increased communication skills in different aspects, but she also felt that it would have been more enhanced if body language or facial expression could be added in Second Life.

“It’s really very helpful to collaborate with other students in different parts of the world. It helps to increase communication skills for those who has communication problems but this can be made better if body language was added to Second Life...”

As far as social relationship or interaction is concerned in Avatar based learning in Second Life she did not found it much effective and beneficial.

“... I think this is more better in real world class because they can see each physically in the class they can talk more but in Second Life you don’t have much time to do this and also you can’t see each other physically .....”. 
Having experience of 3D worlds or Second Life before going to such kind of course, would be better since it would be helpful to concentrate on the course rather than trying to learn how to operate Second Life.

“If we don’t have the skills how to use avatars or experience in using Second Life it’s hard to concentrate on the teachers lectures ....”.

Communications with teachers about the difficulties she got and also feedback about the work tasks, she would prefer online mode or in Second Life as she mentioned but for discussing with students she used e-mails.

“I actually made discussions with class mates about assignment through use of e-mails mostly for contacting them. However for communicating with the teachers about assignment or feedback I mostly use Second Life ...

While interacting with students in Second Life via chat or voice, she said that she was hesitant to do so since she did not know them personally. She said that lack of gestures made students specifically express their actions through their voice.

“Due to lack of body language the students are expected to answer the question when the teacher asked through voice, for instance when he asked by saying did you have questions we have to say yes/No but if body language was available when such kind of questions asked we can easily answer by nodding our head ....”

In her view the main advantage of avatar based learning in Second Life was, to attend the class she didn’t expected to go to the school and she can stay at home and attend it. Further she stated that it enabled her to be exposed to international students.

Participant 5

She didn't find it easily usable at the beginning of the course, for instance how the application of Second Life works, how to use avatars etc but with the help of the teacher she adapted to it quickly and it did not affect her learning.
“I didn’t find it easy at the beginning of the course for example on how Second Life works, how to move from place to place, how to use my avatar but by reading the materials the teacher has given me and guidance, it became easy to learn. It did not make any problem in my learning ……”

She faced technical problems like connection problems, updating Second Life application, bandwidth which was annoying but they did not affect her learning. In using Second Life avatars to communicate online with other avatar, she found it comfortable since she did not expect to show herself for others as she mentioned.

“I find it comfortable because you didn’t need to show yourself to other people and I can stay at home I don’t need to worry about what I have to wear, how I sit …”

She finds interacting with avatars artificial as a strong connection is not established between students.

“I find it artificial because every interaction does not have physical communication and sometimes you will face technical problems like connection problem, microphone so on which does not happen in normal class …”

Saying about the collaboration activities, she found it effective but some activities needs to be implemented more productively.

“I did much on collaboration activities with students and it will expose you to different views of people which might help you to get something from it. Of course, I would say it does make you learn more from others …”

Relating to relationship/interaction between students and also with teachers she found that as students speak less with each other since they do not establish a personal connection. As a result it gets harder to interact easily.

“I think you speak less to other students because you didn’t have real contact with students and teachers as you do in real world class so it’s not much socially interactive …”

Activities such as virtual field trips, role plays, and small discussions about work tasks with students in Second Life helped her to get a thorough
experience and increase her learning as she was exposed to students from
different backgrounds, cultures and places as she described.

“It’s nice to speak and discuss about work tasks, role plays etc. with
students. Because, most of students are from different communities, cultures
and continent. As a result working them will help you to get different kind of
experience and knowledge...”

Concerning previous experience of using 3D worlds, she did not find a
significant difference as she got fast computer and good connection.

“I don’t think, not having experience of 3D world does have much
significant problem as far as you have good internet connection and good
computer for attending this course in Second Life...”

It was easier for her to get the course objectives and she further explained
that it depends on the teachers, to make it successful. As she discussed the
role of teacher’s feedback, additional resources and comments using
flexible communications mechanisms like e-mails, pod-casts, blogs and
voice communication in Second Life, she found it very effective and
supportive. Also they are private and confidential to each person.

“It was really effective for learning to have such kind of flexible
communication methods.....I mostly use e-mails to communicate with my
class mates but for communicating with the teacher it depends on the
situation for instance if I come with question while I was studying I might
ask him through e-mail ...”

She discussed that she were more involved and active while interacting with
other avatar as she could not see them. She finally described that lack of
gestures in Second Life has some influence on learning.

“If you are able to see others while you are interacting during class and
watching the teacher while giving lectures would be nice to understand
more. I think lack of the body language will have some effect ...”

Talking about the benefits she says travelling is less and it is financially
beneficial and, shy people can interact more effectively.
The following tables (Table 8 - Table 12) show the summary of student participants’ answers. Each of the five tables summarizes the views of student participants for each theme. The first columns in the tables are the questions which can be found in Appendix 2 under the specified themes. The next five columns represent each participants view and P1, P2 are abbreviations of Participant 1, Participant 2 etc. The last column of each table is the overall view we derived from each response.

**Second Life Theme**

Table 8: Summary of student participants views on Second Life Theme

<table>
<thead>
<tr>
<th>Q.No</th>
<th>Student Participants’ view</th>
<th>Overall View</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>She felt complicated at the beginning and it affects her learning.</td>
<td>She felt complicated at the beginning and it affects her learning. Over all, most of the participants find Second Life easily usable except a few problems they have faced at the beginning of the course which later resolved and adapted to it. But for some students who found it complicated had some consequences on their learning capabilities.</td>
</tr>
<tr>
<td>2</td>
<td>Faced problems with bandwidth, graphics, and installation on others PC.</td>
<td>Even though, the participants have faced technical problems, it did not affect the course objectives due to well constructed pedagogical practices.</td>
</tr>
<tr>
<td>3</td>
<td>No effect.</td>
<td>Except the first time the avatars showed up in different and unique costumes, it did not made significant problem on their learning as the most of participants mentioned.</td>
</tr>
<tr>
<td>4</td>
<td>She felt comfortable.</td>
<td>Most of the participants agreed or believed that using avatars to communicate/interact online is comfortable. Even though for some it was a bit complicated in the start of the course.</td>
</tr>
<tr>
<td>5</td>
<td>She felt it partially real.</td>
<td>There was a mixed variation among the participants. For those who felt it artificial it was only due to the reason they were not able to see the real people.</td>
</tr>
</tbody>
</table>
### Constructivism Theme

Table 9: Summary of student participants views on Constructivism Theme.

<table>
<thead>
<tr>
<th>Q.No</th>
<th>Student Participants view</th>
<th>Overall View</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Collaboration activities enhanced her learning.</td>
<td>Collaboration activities did enhance their learning capabilities.</td>
</tr>
<tr>
<td>2</td>
<td>Harder to establish a social connection.</td>
<td>It was harder to establish a social connection among students which might influence their learning performance in some aspects.</td>
</tr>
<tr>
<td>3</td>
<td>Enhanced her learning in different aspects.</td>
<td>All the student participants felt that activities like virtual field trips, role plays, and small group discussions had a positive influence on their learning attitude.</td>
</tr>
</tbody>
</table>

### Cognition Theme

Table 10: Summary of student participants views on Cognition Theme.

<table>
<thead>
<tr>
<th>Q.No</th>
<th>Student Participants view</th>
<th>Overall View</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes it has an impact on her real life.</td>
<td>The knowledge they have got from this particular course in Second Life has benefited them for their real life expertise.</td>
</tr>
<tr>
<td>2</td>
<td>Yes it has an impact.</td>
<td>Previous experience of using 3D world or Second Life helped some students during the course especially in using Second Life applications as it helped them to concentrate more on the course content.</td>
</tr>
<tr>
<td>3</td>
<td>Yes it was easy to get the course objectives.</td>
<td>Most of the student participants found it easy and got the course objective they wanted from this course. But some of them claimed that if certain features like expressions and body language would be there it could be even better.</td>
</tr>
</tbody>
</table>
### Synchronous and Asynchronous Theme

Table 11: Summary of student participants views on Synchronous and Asynchronous Theme.

<table>
<thead>
<tr>
<th>Q.No</th>
<th>Participants view</th>
<th>Overall View</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes it had a great impact as it was more specific and categorised.</td>
<td>Getting feedback through email is convenient and effective.</td>
</tr>
<tr>
<td>2</td>
<td>E-mail &amp; Skype.</td>
<td>In Second Life.</td>
</tr>
<tr>
<td>3</td>
<td>Was more involved with other students.</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Yes felt more engaged in classes as she was able to speak when compared to emails or other distant education.</td>
<td>Yes he found it engaging.</td>
</tr>
<tr>
<td>5</td>
<td>Yes she feels that lack of body language has an impact on learning as it is hard to express yourself more specifically.</td>
<td>Yes he feels that lack of body language has an impact on learning.</td>
</tr>
</tbody>
</table>

### General Theme

Table 12: Summary of student participants views on General Theme.

<table>
<thead>
<tr>
<th>Q.No</th>
<th>Participants view</th>
<th>Overall View</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main difficulties were technical problems, lack of body language.</td>
<td>Not many difficulties.</td>
</tr>
<tr>
<td>2</td>
<td>It is encouraging for people having problems in speaking in front of others and it has less pressure.</td>
<td>The main benefits he got were international exposure.</td>
</tr>
</tbody>
</table>
Participant 6- Teacher of the course Mr. David Richardson

Mr. Richardson explains about usability of Second Life of students and behaviour of their Avatars by saying at the beginning of the course he spends a lot of time making sure that student avatars behave and move around the Second Life comfortably, since it was very common at the beginning of the course that most of the students were unable to control their avatars very well. They keep bumping into other avatars and he tried to handle these problems by making them feel confident and calm. He constantly gives guidance and also gives them an impression that these issues are not important. He further mentioned that it is more real as when students bump into other avatars or sit on other avatars they apologize.

“... students apologize when they run into other avatars...”

Speaking about how technological factors like bandwidth, computer performance, Internet access of students affect his teaching process, he said that whenever a technical problem comes he has to make a quick pedagogical decision to effectively perform the course. He always has to make alternative arrangements like replying by chats or emails or fixing another appointment to carry on what they were not able to finish. He sees these technological problems very temporary and coincidental and he builds a class environment where these problems are very minor and are of least concern.

While discussing the issue of students dressed up in different costumes which might affect the attention of other students, he says its even normal in real world class when people comes in different forms it does affect attention of the teaching but after some time every one gets adapted to it. He mentioned that he has seen students dressed up as a dragon, old man, young revealing women etc.

“If I see some one who is a attractive woman, as I am a man I can be attracted by her. But this will also happen in the real world to me but as a teacher I have to be disciplined and follow pedagogical parameters as an experienced teacher... As a teacher it is important to know our job we have to give them... what is expected from us and not to make them friends or other things.”

He believes that for this course, collaboration activities or problem solving role plays in Second Life can increase student’s performance tremendously. He later mentions collaboration activities are made easy and helps the
students to perceive more as these activities can be done in various simulated locations of Second Life like around campfires, waterfalls helping the students to feel less pressure. Also roleplays’ can be made interesting by creating virtual spaces which are apt for the roleplay.

“... I would say tremendous amount.. in this business talking course since it was mainly focusing on developing skills. All the collaborations activities between students would benefit all the students to get practical knowledge from each other since they have different kind of expertise skill. There you find something that is difficult to do it in real world, for instance when students collaborating with the US students in Second Life they are doing it easily. To make this thing in real world class will be costly and time consuming...”

His main way of making students understand is to let them speak and discuss among each other rather than just relying on his lectures. International exposure also helps students to collaborate more effectively. One main advantage he described is, since it is not possible to see real people it is easy for shy students to collaborate more. Regarding student’s interaction in Avatars based learning in Second Life; he believes that it did enhance fairly the intimacy among students. This will play a great role in adding value in student’s capability in pedagogical aspect as well.

“The fair amount of interaction was seen in Second Life in this particular course even it is observed outside the conventional course program and all students are able to socialize with each other. I would say that it absolutely added value for the students learning capability not in terms of visual aspects rather in terms of course objectives …”

Mr. Richardson believes that having expertise of 3D worlds can be important in other courses where it is required to build objects like buildings, designing etc., but in this course he planned the sessions in such a way that both the experienced and inexperienced feel comfortable and he did not want the experienced students create a environment which may make the inexperienced one’s tensed and he sees that this barrier disappears quickly by more emphasizing on English speaking.

“It depends on the type of the course when it comes to business talking courses the added advantage that the students who has experience of using Second Life has disappears very quickly because the important thing is how well they interact each other and starting from the course launch we are not
doing tough things in Second Life but I only tried to teach how to use Second Life and I don’t want influence the inexperienced by experience one. I think for this course it does not have a significant problem ".

Concerning student’s understanding in avatar based learning in Second Life with respect to real world classes; he said the understanding level was almost the same. He further pointed out that, as a language teacher he believes that what you do in real life can be done in the same way in Second Life. One of the advantage of Second Life was you can work with people from different place with different backgrounds which is hard to arrange it in the same way in real world.

“I would say that understanding was the same. You can do the same thing you in real life. The big difference is you working with people coming from different parts of the world with different back grounds which sometimes difficult to make it in real life ....“

Discussing about limitations of receptive languages in Second Life like body language or facial expressions, he claimed that expressions like nodding, gasping can be generated but they look artificial and not spontaneous, so it compels the students to put their expressions in words. It is hard for teacher to understand what the students are thinking and the teachers have to communicate as if they do it with real adult people and break down the teacher-student hierarchy between them. If they fail to do so there is a high possibility that students may leave the computers leaving behind, the teachers with just their avatars. It depends very much on the attitude of the teacher the way he attracts his students. In this respect every thing hinders how the teacher handles activities and it puts huge premium on pedagogical practice.

“One of the limitations of Second Life was lack of receptive or body language …the students expected to put their expression in wordings. It is hard for me as a teacher to understand what the students are thinking and the teachers have to communicate as if they do it in a real life and break down the hierarchy between us …....”

“... it depends very much on the attitude of the teacher because in this respect everything really hinders on how the teacher set activities and handles. One of my feeling in general about the use of ICT in teaching especially on universities it puts a huge premium on good pedagogical practice cause if you don’t have it the ICT based up doesn’t work …"
As he mentioned about effectiveness of communication mechanisms with students such as usage of emails to give feedback, podcast, blogs he said

“Privacy and confidentiality will be granted by giving proper feedback through e-mails ...”.

Concerning the difficulties he faced while conducting the courses in Second Life, he found a lot of difficulties especially technical ones such as, in the beginning of the course helping students to manage their avatars etc but he managed it well by being prepared and alert. As far as evaluation of students in Second Life is concerned he found it difficult, however as he said it depends on the course which is given. Since it was a language course he tried to soften things for students.

The following table (Table 13) summarizes the view of the teacher for all the questions under each theme in Appendix 3. The first column is the questions which can be found under Appendix 3 and the second column is the summarised answers of the teacher.

Table 13: Summary of teacher's reply to the interview protocol.

<table>
<thead>
<tr>
<th>Participant - Teacher of the course Mr. David Richardson</th>
<th></th>
<th>Second Life Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td></td>
<td>Spend more time in beginning to help students behave in virtual worlds as it is very common for them to unable to control avatars.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>He has to show high levels of confidence and calmness during the classes and have to always give a impression that every thing is fine.</td>
</tr>
<tr>
<td>Q2</td>
<td></td>
<td>Make right pedagogical decisions and always be alert.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>He has to give them confidence that these problems are very minor and are of least concern.</td>
</tr>
<tr>
<td>Q3</td>
<td></td>
<td>Yes it affects his seriousness but they have to get over it very quickly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Constructivism</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td></td>
<td>He believes these activities have tremendous affect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>His main strategy is to make students speak more rather than him just giving lectures.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>He simulates these activities to give them a real life experience and help them perform smoothly. It helps people to give an international exposure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>He believes that people who are shy speak more since they don’t see each other, helping them to collaborate more.</td>
</tr>
<tr>
<td>Q1</td>
<td>It depends, but he plans the sessions in such a way that both the experienced and inexperienced feel comfortable and no one overlooks each other. And he sees that this barrier disappears quickly by more emphasizing on English speaking.</td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>He experiences a fair amount of interaction among students which is spontaneous. It creates a positive learning environment.</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>The understanding is the same. But doing such courses in Second Life it gives more exposure.</td>
<td></td>
</tr>
</tbody>
</table>

**Cognition**

| Q1 | Students are forced to give expressions through words, as generated expressions look quite artificial. The teachers have to be more active as there is a high possibility that students may leave the computers leaving their avatars behind. |

**Synchronous Vs Asynchronous**

| Q1 | It depends on the attitude of the teacher. |
| Q2 | Effective communication. More privacy and confidentiality by giving feedback through emails. |

**General**

| Q1 | Not much. |
| Q2 | Mostly technical difficult to control student avatars and also his own avatars. But it can be overcome by |
5 Discussion of the Findings

This section provides a discussion of the empirical findings based on the theoretical Framework and supporting literature.

5.1 Virtual worlds and Second Life for learning

In virtual worlds, avatars can move around freely, and interact with each other by means of integrated text, audio, video and chat tools (Dickey, 2005). The students expressed that this feature of virtual worlds has made their understanding easy as they can see, hear and experience more reality, compared to other online courses. Explaining this further, the teacher mentioned that students apologize when something inappropriate happened with their avatars, e.g. bumping into each other or sitting on other's avatars. Furthermore, the students find this environment immersive as they are representing themselves through another, virtual body called avatar.

One special feature of virtual spaces that students mentioned in the interviews is that learning activities are not dependent on a classroom but can be made around interesting virtual spaces like a campfire or beside a waterfall. The teacher mentioned that using these features to a maximum extent can be advantageous to both teachers and students. Studying in such informal settings like mentioned above, helps the students to feel less pressure and enhance their learning more, the teacher stated. He explained further, that using Second Life for such courses makes it easy to simulate real settings and environments like beaches, amusement parks or museums, which is not possible in other online courses.

It has been proved that virtual learning environments are not restricted to distance education (Dillenbourg, et al., 2002), they can also simulate traditional classroom activities. For example in this course, students gave power point presentations by using slides, which were projected on a virtual screen in a virtual classroom, thus simulating a traditional class-room. In another session it was observed that the students were given an assignment where they have to present a special location in Second Life like a cultural place, a museum or something similar. By visiting these kind of different, virtual places, students stated, that they experienced more of reality, that this could not have been done in reality and that it helped them to increase their creativity and understanding. They also mentioned that it gives them exposure to valid content and culture confirming the study by Warburton and Perez-Garcia (2009) mentioned in section 2.1.1.
The usability of avatars also plays an important role in perceiving learning. Those students who had problems to control their avatars said that, the time they spend in getting adapted to the environment in the initial stage could be better used to learn the initial course's contents.

Because of the high possibility of technical problems in such worlds the teacher mentioned that he has to ensure that no one gets frustrated easily. The teacher further explains that he has to be extremely calm and encouraging in such situations and that he should put up a comforting environment saying that these issues are of least concern. There is a high possibility that students may get easily demotivated as they do not see each other in reality. Because of this the teacher stated that he has to present himself as very friendly and try to establish a connection with the students and break down the general teacher-student hierarchy.

One feature of Second Life is that people can fly and dress up in different costumes. On investigating if such features affect students or teachers attention, both parties explained that it may distract them for a short period of time but it does not have any affect on perceiving learning. The teacher mentioned that sometimes, students turn up in different forms like a young revealing woman, a dragon, an old man which make others think and lose their concentration for sometime but they soon get adapted to it.

As Rive, Billinghurst, Thomassen and Lyons (2008) wrote, nonverbal communication is limited in Second Life. Similarly, most of interviewed students stated, that they expected more spontaneity in face-to-face exchange and the usage of body language. Also the students expressed that since there are no hand or body movements it is sometimes difficult for speakers to express more through plain words. The teacher mentioned that students find the forcefully generated expressions, which are currently used in Second Life, very unreal as the timing differs by some few seconds and the expression is found to be inappropriate after the moment passed.

5.2 Constructivism

As Jonassen (1994) mentioned constructivist learning environments support collaborative or joint creation of knowledge for students through social negotiation and not competition among students. It should be more emphasised on knowledge creation instead of knowledge reproduction. With avatar based learning in Second Life, the students felt that collaboration activities did enhance their learning capabilities positively. Starting from the course introduction the students were observed by us collaborating with US buddies and also among each other. These tasks
cannot be done easily in reality as it is difficult to get in touch and learn in
the presence of students from different countries without actually travelling
there, but it is easy to be accomplished in Second Life. They were also
observed by us doing group tasks, practising presentations, discussions, and
generally sharing experiences in different spots of Second Life. The
students told that these activities helped them to share ideas easily as they
were not only talking about them, but also showing others by visiting and/or
performing similar simulated places/activities in Second Life.

Such collaboration activities can be easily done in Second Life as people
from all over the globe can interact in an environment which can also be
constructed by the students based on their own ideas, giving them
confidence to perceive more.

Sener (1997) described three basic principles inside constructivism one of
which is situated/anchored learning which emphasizes that the majority of
learning in such environments is situation or context based learning.
Learning experiences through authentic activities like cognitive
apprenticeships, case based learning environments; role plays, etc. help the
learners to get richer and more meaningful learning experiences. In the
same way, the students in our study were observed performing problem
solving activities, role plays representing different situations, giving
opinions on different issues, etc. The students explained that it helped them
to react spontaneously and constructively which enhanced their learning.

One advantage of doing such activities in Second Life is that speakers tend
to be less confused about who is speaking in a group as a green symbol
keeps blinking above the speaking person and others can easily continue
when they are finished. This is helping students to understand more as such
similar scenarios may be confusing when learning through other online
tools.

Sener (1997) described in his second principle of constructivism that
social negotiation of knowledge or learning assumes that learners form and
test their constructs in a discussion with other learners within a large group
of society. This helps learners to enhance their learning capabilities. In our
case, group based activities and group discussions helped them in testing
their constructs and improve their learning capabilities in many ways. As
observed during a session in our case, the teacher presented some scenarios
to the students, asked them to discuss it and to give their opinion later. For
instance, once they were told five incidents from the teacher's life out of
which one was not true. After the teacher left, the students were testing each
of their argument against others and came to a conclusion. Even though the
main aim of this task was to enhance their listening and responding skills, it
helped them to test their constructs and improve their thinking capabilities.
In doing this, they were able to deal with different opinions and reflections each of them had, which enhanced their learning positively.

As illustrated by Kanselaar (2002), social constructivism is a theory from Lev Vygotsk, which states that the teacher has an active role in learning as it is the teacher who assists the learners to develop the learner’s mental ability and capacity through discovery. Mostly the teacher acts as a coach behind the students. Our observations showed that the teacher has been following the same method of teaching strategy. The teacher explained in the interview that he stresses that students speak more and construct and interpret their knowledge by themselves rather than waiting and relying on his lectures. He believes that this strategy helped them like a real life experience and to be creative as well. The teacher also played a role to make constructive pedagogical decisions during the course, because Second Life is subjected to many uncertainties like technical difficulties, time differences, etc.

Cobb (1994), illustrated socio-cultural constructivist learning as an approach in which individual knowledge or learning relies on social interaction or communication in a particular context. Learning is a process of acculturation into an established community of practice and “individual’s participation in culturally organized practices and also face-to-face interactions” (Cobb, 1994). Okita, Bailenson and Schwartz (2008) said that social interaction enhances learning in such environments. But during our study, the students mentioned it is somehow harder to establish strong social connection among themselves in contrast to that of the real world classes, which influenced the students learning performance. Students explained that they felt that interaction was very less and that it was not easy for them to be social while performing tasks. They felt that there was less intimacy as they did not know the real person behind the avatar and so, they hesitated to express their opinions or ideas. The students said that there was only a fair amount of interaction among them, even if they were working together in a group in different problem solving activities, because of the absence of sense of reality in knowing the persons behind avatars.

Constructive methods have to be applied by both students and teachers in virtual environments to run the course more smoothly. During our observations we noticed some constructive methods followed by the teacher which were later confirmed by him during the interview. One approach was to ask the students themselves or the whole group in which they worked to grade themselves as it helps them to analyse their efforts and also improve their judgement skills. This also helps the teacher himself to realize the amount of work and effort the students put in the teacher's absence as it is hard to judge in such online courses. It has also been observed that it is not
only the teachers who should be constructive but also the students. The students were observed using methods like meeting 30 minutes prior to the class and practise when they had to present in a group so that there was no confusion during the actual presentation as they may not easily understand others intentions due to lack of body language.

5.3 Cognition

As briefly illustrated in Section 2.3, cognition is about the process of knowing and, more precisely, the process of being aware or understanding the learners’ knowing, thinking, learning and judging in particular context.

Here in our case the students mentioned that it was hard to understand what other students are thinking or the opinions they had in Second Life, as it is not possible to see their spontaneous expressions at all. They further explained that in some cases it becomes hard for them to judge each other’s ideas as they are not aware of the complete intention of the person behind the avatar. Thus the cognition level in understanding other students is affected and they mentioned this hindered their learning as they do not form a strong bond while performing group tasks.

Students mentioned, Second Life can be changed into more cognitive environment by adding certain features like spontaneous body language or facial expressions. There is a high possibility that people understand more about others if these features are present. For instance during presentations or role plays the students mentioned that they have to be more expressive and clearer during interactions and discussions. The reason for this is that it may not be possible in all cases that all students have the same understanding, i.e. the levels of cognition are different.

In addition Gielen (2008) elaborated in such a way that: “Cognitive learning is the result of listening, watching, touching or experiencing.” In our case study it was observed that all the students from different parts of the world were interacting, talking and listening by using headphones and through their avatars in a good way except some minor technical problems. The students explained that listening and interacting with different people and experiencing some simulated environments increased their cognitive levels of knowing, helping them to perceive more when compared to other online learning platforms.

As described by Cunia (2007) learners manage and organize their own learning and they obtain new information or knowledge easily and efficiently when they can associate and integrate the new knowledge with the one they already have. As it was observed in our case study, previous
experience of using 3D worlds or Second Life helped most of students during the course as they could concentrate more on the course content already from the beginning rather than spending time for learning on how to use Second Life. The teacher mentioned in the interview that having expertise of using 3D worlds can be even more important in other courses where it is required to build objects like buildings, designing etc. However, the observed course was planned in such a way that both the experienced and inexperienced students can feel comfortable and not to allow the experienced students create a environment which may make the inexperienced one’s tensed. This issue was resolved by concentrating on the course content. Having said all these, the teacher explains that students get practical knowledge from each other during this course since each has different kind of cognitive level. Also the students mentioned the knowledge they have got from this course has benefited them by increasing their cognitive levels which helped them to understand more.

5.4 Synchronous Vs Asynchronous

In our analysis it was noticed that both synchronous and asynchronous forms of e-learning play a vital role in perceiving knowledge in virtual environments.

The students find the biggest advantage of Second Life compared to other e-learning methods is that interaction can be done live by talking through avatars and sending instant messages synchronously. But also they mentioned that even though they were communicating synchronously they found it hard to understand other's avatars intentions as they lacked expressions and body language. Further they explained, this drawback made it hard for them to perceive learning as during the course sessions they have to be constantly attentive and concentrate on other student's voice as they cannot see other students intentions through their body movements. Also students felt that sometimes they had to focus and think more on how to be more expressive through words than doing the actual course work, so that others can understand easily. They mentioned that even small expressions like nodding the head or hand movements had to be expressed through words and it would have made their learning easy and flexible if these features were present. One example observed by us occurred during an exercise where students have to interrupt the teacher and react to his stories with expressions like 'ya', 'ok', 'aha'. Sometimes the teacher would pause on purpose for a while so that students can actually react. As a participant observer it was hard for us to understand if it was a technical problem or
some other reason that the teacher stopped. When the students were asked about it they felt that it would have been easier to understand learning if the teacher’s expressions like mouth movement, eye, head and hand movements could be seen. Such similar situations were also seen during roleplays and group presentations.

In a study conducted by Andersen, Hristov and Karimi (2008) concerns have been expressed that students are exposed to many external stimulus in virtual environments and that makes it harder to remember the lecture afterwards (Andersen, Hristov and Karimi, 2008). Students may find it harder to grasp the course contents, suggestions or improvements given by the teacher in such environments. So to help students perceive more, it is important that students always have a secondary, asynchronous source of communication besides the primary source which is the teacher. The students mentioned that maintaining blogs and podcasts, where the course experiences are explained were helpful. But the most important asynchronous form of communication to perceive knowledge that the students found useful, was the assessment emails. Students describe them as effective, supportive, convenient as it may not be easy for them to grasp the feedback the teacher suggested during the classes in Second Life. But with the help of such feedback which is specific, categorised, private and confidential, it helps them to understand more and makes them feel comfortable.

Since Second Life's support to educational practices is still in its infancy stage there may be many difficulties. Thus, it is important that teacher make a fine blend of both synchronous and asynchronous communication.
6 Conclusion

This section discusses the answers to our research question followed by further research.

RQ: How do students and teachers perceive learning through avatar based interaction in virtual world environments?

Virtual education is just like an enhancement to e-learning which was a development to the traditional classroom training. With avatars based interactions in virtual worlds it is important to use best pedagogical techniques, so that we do not lose the benefits of education (Andersen, Hristov and Karimi, 2008). Using avatars in education has its own benefits as well as drawbacks. The main perceptions of Second Life from a student's and teacher's perspective, found in this study, are discussed below.

- Students get a sense of feeling that their avatar is real and this helps them to perceive more when compared to other online education systems without avatars.

- Factors like usability of avatars, technical problems and getting adapted to the environment play an unfavourable role in perceiving learning, as the time spent on those things could be used better to learn more course objectives.

- Performing activities in different places of Second Life such as camp fires, near waterfalls, different cultural places etc. made students perceive the course objectives well as they feel relaxed and less pressure.

- Second Life's environment is more helpful to simulate real conditions and situations, which the students may encounter on daily basis. Exposing them to semi-real situations like replicating a formal room with discussion tables to enact roleplays instead of just sitting in a plain virtual class with chairs or suggesting them to visit places like Miami beach, amusement parks etc.

- It is found necessary that both the teachers and students have to be innovative and constructive to enhance the learning process.
The teacher plays a very important role in perception of students. He has to make good pedagogical decisions from time to time whenever a problem arises. He should create an environment which is motivating and friendly, which can break down the teacher-student hierarchy. This helps the students to understanding and grasp easily.

The lack of spontaneous facial expressions and body language (such as smile, eye, head, hand and body movement) had some impacts in students perception as students have to be more attentive and active in other's presence, e.g. concentrating on their voice's sound and speaking manners all the time as they do not see each other and can not understand other students as easily as in real life.

The challenges we observed or mentioned by the students and teachers are mentioned further. There is a high possibility that the teacher and students may get frustrated in virtual environments. It may be challenging to evaluate students’ virtual performance in some courses according to the teacher. Furthermore, he told us that teachers should emphasize on keeping the students to be focused so that they are not getting bored, leave the computers, thus leaving behind their avatars.

Through this study we tried to give a brief idea on the perception of learning in such environments and gaining more insights about students and teachers understanding, which can be helpful for future developments in Second Life.

6.1 Suggestions by Our Participants to Enhance Learning in Second Life

Second Life in educational settings is still in emerging phase. According to our participants, a separate environment is necessary for teaching so that students feel that it is not only a games platform, but also a serious tool for learning.

Also the participants feel that live images e.g. by webcam, can enhance their learning as they could see and understand peoples expressions easily, allowing them to react speedily and spontaneously.
Below are the suggestions given by our participants in their own words:

“...a separate environment only for teaching..”

“something where people can see others like live images”

“something where people can see others in web cams”

“people have to be more disciplined..”

In short, participants mostly wanted to have a better real-life experience in virtual worlds like Second Life, this also supports our previous claim (see 5.3.) about the importance of body language.

6.2 Delimitation/Limitations

This study has a limitation that it was based on a single language course in Second Life. The result that was obtained from this research in Linnaeus University in Kalmar is difficult to generalize to other universities since we did not consider other universities in our investigation, as this was beyond our scope. It would have been beneficial to know more about student’s ideas, but due to the low response rate, we had to restrict our study to only a few participants. The research could have had more outcomes, if more than one course was observed. However, since this is the only course being offered in Sweden, we wanted to avoid any difficulties during our research. According to Yin (1994) the results, not the population should be given importance.

6.3 Further research

During our research we have identified some interesting subjects for further research. Some of them include how does teaching in Second Life impact faculties as well as students.

These days many courses are being offered through e-learning. It would be interesting to know what other courses are compatible for teaching in Second Life.

One area that has not been researched is, how students are graded and evaluated in some courses based on there virtual performance in Second
Life. This may be interesting as their virtual performance may differ when compared to real life.

Also another topic which we found interesting was to compare the knowledge perceived by students through Second Life with other e-learning platforms like Adobe Connect, Blackboard, Skype etc.

During our literature study it was found that best practices in virtual education needs to be explored. So our suggestion for future researcher would be to find the best pedagogical methods suitable for Second Life and also develop a model.

Also the area which needs to be looked into is how to use virtual worlds in procedural training and informal learning.

6.4 Contribution to body of knowledge

We as a researcher believe that our research provided mainly two benefits, a practical and a theoretical one. The practical benefit is mainly for Linnaeus University on which we have conducted the study. Based on our study Linnaeus University can improve the way of conducting courses in the future. Furthermore, other departments in the university can get an idea in implementing their course as avatar-based learning since there are more courses which might successfully applicable in Second Life. Although there are certain limitations in our study, the output of the result could still be of interest for other universities, which plan to apply avatar based learning in Second Life, too.

In addition, since Linnaeus University is a customer to Second Life i.e. Linden Lab, they can give suggestions for future improvements that are desirable to be added in Second Life. Having said that, we move to the second theoretical benefit of our study. Our study differs from other research in that we focused on the students and teacher’s perceptions in avatar based learning and strategies that makes the learners understand more. As said in previous chapters body language is an important factor in learning. However, most of the previous researches were conducted only focusing on the use and implementation of Second Life for distance education, or on opportunities and challenges issues of learning in Second Life etc. Therefore, we also believe that our results give deeper insights for other researchers in this field.

Apart from the above mentioned benefits, the results of this study contribute to e-learning by highlighting that the institutions who are planning to adopt e-learning techniques especially Second Life should weigh the benefits and disadvantages of Second Life. The concept of body
language in Second Life is relatively new. This study may help institutions to decide if courses which require some degree of body language, e.g. acting classes, etc. are suitable to use platforms like Second Life or not.

Also factors like authenticity, evaluation of students virtual performance should be seriously looked into as these may be a threat to e-learning education. This study can also be helpful to the teachers who might use virtual worlds like Second Life for educational purpose as they might not yet have a strong research backbone on this specific topic. Also another important contribution is that teachers must realize that virtual classes need a fine blend of both synchronous and asynchronous communication in e-learning.
References


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Appendix

Appendix 1

Observation Protocols

Observation protocol for each session

<table>
<thead>
<tr>
<th>Session Number</th>
<th>Location of the session in Second Life</th>
<th>Activities done during this session</th>
<th>Time of session</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observation protocol for students

<table>
<thead>
<tr>
<th>Student Characteristics</th>
<th>Were events in Sessions observed?</th>
<th>Devices used</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students participations in the lectures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students use of resources in Second Life (SL Theme)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students interaction and Collaboration while performing tasks (Construction Theme)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students getting the course objectives or new knowledge (Cognition Theme)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulties while attending the courses such as technical (Second Life Theme)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Observation protocol for teacher

<table>
<thead>
<tr>
<th>Teacher Characteristics</th>
<th>Were events in Sessions observed?</th>
<th>Devices Used</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher inspired students to be active in course attendance</td>
<td></td>
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</tr>
<tr>
<td>The teachers gave the awareness of Second Life environments &amp; how to use them with respect to the course. (Second Life Theme)</td>
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<tr>
<td>The teacher made the students interact &amp; collaborate in doing their work tasks (Constructivism Theme)</td>
<td></td>
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<tr>
<td>The teachers used the Resources (features) available in Second Life to conduct the sessions well. (Second Life theme)</td>
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<tr>
<td>The teacher tried to give the students the knowledge expected from the course in interactive way as compared to RW. (Cognition theme)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The teacher found difficulties while conducting the course.</td>
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</tbody>
</table>
Appendix 2

Interview for Students

I am Viri Appaneni and this is my colleague Yenus Likisa. We are working on our master thesis at Linnaeus University, focusing on how virtual worlds can be used in an educational setting. Our main focus is how do students / teachers perceive learning when communicating through Avatars. We are interested to interview you and discuss your experiences in using Second Life for your studies. The interview will mainly include questions related to interaction and learning issues related to Second Life. Do you have any questions at this time?

Thank you for your willingness to participate in this research project. Before we begin the interview, I would like to reassure you that this interview will be confidential and the tape and transcripts available only to us. But if you are comfortable to allow us publish your name please let us know. Do you mind if I record the interview? ______<if yes> If there is anything you don’t want me to record; just let me know and I will turn off the recorder.

Is it all right for me to turn on the recorder now?

1. Name: 2. Age: 

3. Gender: 4. Nationality: 

5. Geographic Area from where you access Second Life: 

6. Educational Background: 

7. Your Expertise in computer usage: Basic/ Average/ Good/Very good. 

8. If you had to rate your Internet Accessibility and Bandwidth what would it be: Medium/ Good/ Fast:

9. What type of Computer you used to access Second Life during the course and if you have it rate it is it slow/medium/fast? (If Answerable):
10. a) Have you ever used Second Life or any other online, Internet-based 3D Worlds Prior to taking this course?

   b1) If you answered yes above, which One?

   b2) Comparing the general features which 3D world did you find better and why?

11. Have you ever taken any other courses in Second Life or other e-learning/distant education courses:

12. Why did you take up this course and were you completely satisfied with this course available in Second Life?

13. If the same course was available in traditional classroom training would you prefer to attend in Second Life over it? If yes why?

**Second Life Theme**

1. Describe how you found the usability of Second Life and controlling your Avatars and were it easy for you to learn to navigate in Second Life. How do you think it affected your learning?

2. Could you explain how did the technological factors like bandwidth, computer performance, and Internet access affect your learning in Second Life?

3. How did you feel when students or teachers are dressed up in different costumes does it affect your attention / seriousness of learning?

4. Describe briefly how comfortable do you feel in using Second Life avatars to communicate online.

5. Describe briefly how real or artificial do you find the interaction when interacting with avatars.

**Constructivism Theme**

1. Explain how collaboration activities like interacting with US Students or problem solving, role plays in Second Life will enhance learning among students?
2. Explain how learning through Avatars in Second Life has an impact in relationship/interaction between students?
   • If so do you believe that it adds value for students learning capability in Second Life?

3. Explain how activities like virtual field trips, role plays, and small group discussions have an influence on your learning.

Cognition Theme

1. Does the knowledge you have gotten from learning in Second Life has an influence in your daily life, for example do you feel more confident now when you are speaking in public? If so, can you describe it?
2. What influence of your Second Life expertise skills (previous experience with Second Life) have in learning process?
3. Can you explain how understanding of learners while learning in Second Life when compared to the real world class? Are they easily getting the course objectives?

Synchronous Vs Asynchronous Theme

1. In your learning process, describe how effective was the role of teachers emails with feedback, pod-casts, blog maintained by the teacher over the normal chat or voice communication in Second Life.
2. Did you prefer to clarify questions or communicate with students and teachers through avatar based interaction in Second Life or Emails. Can you explain why?
3. Could you explain us how did you access the pod-casts or blogs to know information about a missed class or some details during a class instead of mailing the teacher or other colleagues?
4. What influence of interaction in Second Life has on student engagement in classes?
   • Describe, do you feel hesitant/more involved to interact with other students in Second Life via chat or voice as compared to emails?
5. During interaction or role plays or classes do you think lack of features like body language has an impact on learning?
General

And finally,

1. Do you find any difficulties while taking or conducting course in Second Life?
2. What kind of benefits you have got attending or conducting courses in Second Life when compared to other forms of distance education or traditional face to face?
Appendix 3

Interview for Teachers

I am Viri Appaneni and this is my colleague Yenus Likisa. We are working on our master thesis at Linnaeus University, focusing on how virtual worlds can be used in an educational settings. Our main focus is how do students / teachers perceive learning when communicating through Avatars. We are interested to interview you and discuss your experiences in using SecondLife for your studies. The interview will mainly include questions related to interaction and learning issues related to Second Life. Do you have any questions at this time?

Thank you for your willingness to participate in this research project. Before we begin the interview, I would like to reassure you that this interview will be confidential and the tape and transcripts available only to us. But if you are comfortable to allow us publish your name please let us know. Do you mind if I record the interview? ______<if yes> If there is anything you don’t want me to record; just let me know and I will turn off the recorder.

Is it all right for me to turn on the recorder now?

Name:                                                           Designation:

Experience in Teaching:

Why did you prefer to use/choose Second Life for conducting this course?

Second Life Theme

1. Describe how teaching can be affected by student’s usability of Second Life and behaviour of their Avatars in it.
2. According to you opinion how do the technological factors like bandwidth, computer performance, Internet access of students affect your teaching process in Second Life?
3. When students are dressed up in different costumes does it affect your attention / seriousness of teaching?
Constructivism Theme

1. How do you think collaboration activities like interacting with US Students or problem solving role plays in Second Life will enhance learning among students? Can you describe it?
2. Do you think activities like virtual field trips, role plays, and small group discussions have an influence on learning? If yes how?
3. Explain how learning through Avatars in Second Life has an impact on relationship and interaction between students?
   - If so do you believe that it adds value for students learning capability in Second Life?

Cognition Theme

1. From your experience do you believe that expertise in Second Life skills (previous experience with Second Life) have a greater impact on students in learning process?
2. Explain the difference in student’s understanding between Second Life and real world classes. Are they easily getting the course objectives?
3. Explain the difference in teaching between Second Life and real world classes. Are you easily getting response, like nodding, gasping etc. from the students?

Synchronous Vs Asynchronous Theme

1. During interaction in classes or role plays, describe how the lack of features like body language has an impact on learning or teaching?
2. Do you think that the presence of more flexible features like interaction through avatars, podcasts etc. have an impact on students to opt for this course?
3. During the course, describe how effective were emails with feedback, pod-casts, blogs maintained by the teacher over the normal chat or voice communication in Second Life in teaching process.

General

1. Do you think that the pressure of making the courses in Second Life successful have influence on teaching style?
2. Do you find any difficulties while conducting course in Second Life?

- How challenging do you find to evaluate students based on their virtual performance through Avatars?
- How do you manage the complexity of obscene things of Avatars or authenticity issues?
- Do you find it difficult to keep the group focused during classes in Second Life?