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Meaning, Identity, and Learning

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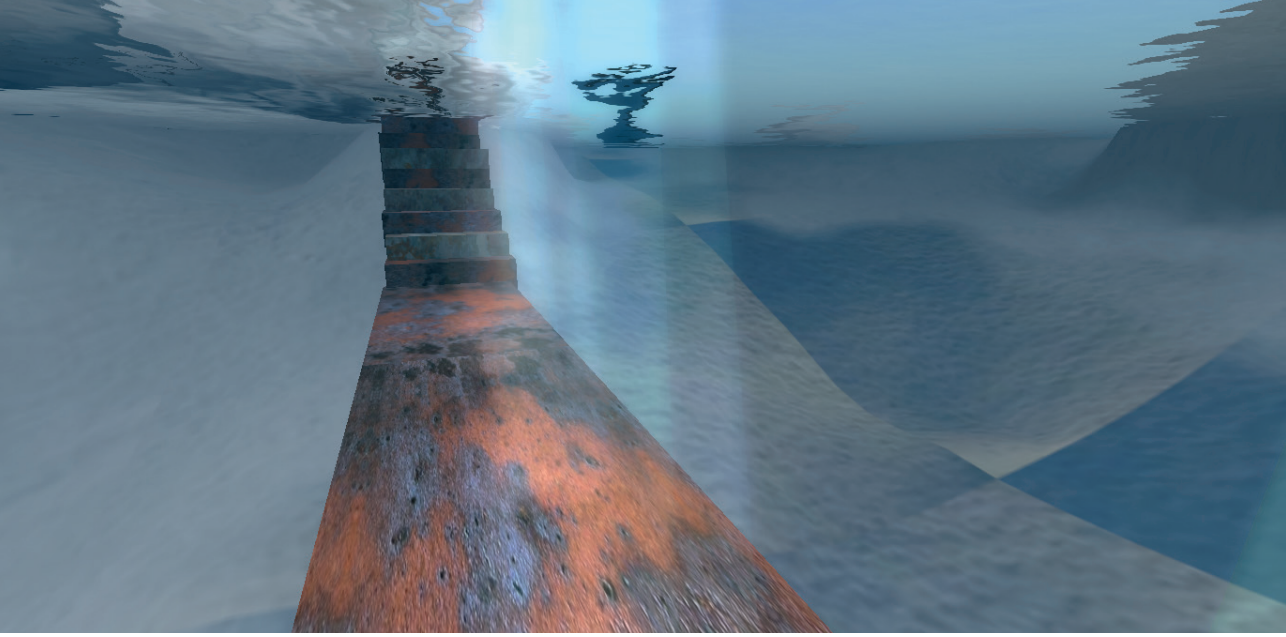

AVATAR-MEDIATION AND TRANSFORMATION OF PRACTICE IN A 3D VIRTUAL WORLD

MEANING, IDENTITY, AND LEARNING

BY
MARIANNE RIIS

DISSERTATION SUBMITTED 2016

AALBORG UNIVERSITY
DENMARK

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by

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To Lone, Janni, Elsebeth, Birgitte, Oluf and Bo.

CV

Marianne Riis has a background as a vocational teacher at a Hotel and Catering College in Copenhagen, Denmark. In 2003 she earned her Master's degree in ICT and Learning from Aalborg University. From 2003-2013, Marianne Riis held various positions at Aalborg University in the Department of Communication, both in Aalborg and in Copenhagen. She has worked as virtual student councellor, daily administrative manager, teacher and PhD-student at The Master's programme on ICT and Learning (MIL).

Since 2013, Marianne Riis has been employed at The Metropolitan University College in Copenhagen, where she teaches and researches in the field of Vocational Education and Training (VET). Marianne Riis is currently (2015-2017) the leader of a research project on ICT, transfer and boundary crossing in Danish VET.

ENGLISH SUMMARY

The purpose of this study is to understand and conceptualize the transformation of a particular community of pedagogical practice based on the implementation of the 3D virtual world, Second Life™. The community setting is a course at the Danish online postgraduate Master's programme on ICT and Learning, which is formally situated at Aalborg University. The study is guided by two research questions focusing on the participants' responses to the avatar phenomenon and the design of the course.

In order to conduct and theorize about the transformation of this community of practice due to the 3D-remediation a research-led Action Research approach has been chosen to enable research with focus on both actions and critical reflections carried out in four consecutive research cycles from 2007-2011. 53 master students, one main teacher (the author), and several guest teachers have participated in the study. The findings are predominantly based on analysis of asynchronous student discussions in FirstClass™ (1.104 postings) and synchronous participant observation in Second Life (130 hours). A Grounded Theory-inspired approach has been used to generate and analyse the data in this study, meaning that no predefined theoretical framework was used to guide the design of the research cycles from the onset of the study. However, as the research progressed more and more elements from situated learning and the communities of practice theory influenced the design.

The study has demonstrated the importance of the avatar as pedagogical design element given that it is through the avatar the participants identify themselves and others, create meaning and experience learning in the virtual world. Furthermore, the findings show that the avatar cannot be understood devoid of context, devoid of other pedagogical design elements.

In summary, the study contributes with knowledge about 3D Virtual Worlds, the influence of the avatar phenomenon and the consequences of 3D-remediation in relation to teaching and learning in online education. Based on the findings, a conceptual design model, a set of design principles, and a design framework has been developed.

DANSK RESUME

Formålet med dette studie er at forstå og konceptualisere transformationen af et specifikt pædagogisk praksisfællesskab baseret på implementering af den 3D virtuelle verden, Second Life. Praksisfællesskabet er situeret i et kursusmodul på den danske online masteruddannelse, Ikt og Læring, som formelt hører hjemme på Aalborg Universitet. Studiet er baseret på to overordnede forskningsspørgsmål, der fokuserer på deltagernes respons på avatar fænomenet og kursusdesignet.

I forhold til at undersøge og teoretisere om dette praksisfællesskabs transformation grundet 3D-remediering, har der været anvendt en forsknings-ledet Aktionsforskningstilgang, hvilket har muliggjort forskning med fokus på både aktioner og kritisk refleksion. Aktionsforskningen er gennemført i fire cyklusser fra 2007-2011. 53 masterstuderende, en primær underviser (forfatteren) og flere gæsteundervisere har deltaget i studiet. Studiets fund er primært baseret på analyse af asynkron studenterdiskussioner i FirstClass (1.104 indlæg) og synkron deltagende observation i Second Life (130 timer). Med henblik på at generere og analysere data i dette studie har der været anvendt en Grounded Theory-inspireret tilgang, hvilket betyder, at der ikke har været noget prædefineret teoretisk rammeværk til at guide designet af aktionscyklusserne fra begyndelse af studiet. Derimod har flere og flere elementer fra situeret læring og teorien om praksisfællesskaber fået betydning for designet efterhånden som studiet skred frem.

Studiet har demonstreret avatarens betydning som pædagogisk design element, idet det er gennem avataren, at deltagerne identificerer sig selv og andre, at der skabes mening og at læring opleves i den virtuelle verden. Ydermere viser studiets fund at avataren ikke kan forstås frakoblet konteksten, frakoblet de øvrige pædagogiske design elementer.

Opsummerende bidrager studiet med viden om 3D virtuelle verdener, avatar fænomenets indflydelse og konsekvenserne af 3D-remediering i relation til undervisning og læring i online uddannelse. Baseret på studiets fund er der blevet udviklet en konceptuel design model, et sæt design principper og et design rammeværk.

ACKNOWLEDGEMENTS

I have dedicated this dissertation to the original members of the steering committee behind the Master in ICT and Learning (MIL) programme: Lone Dirckinck-Holmfeld, Janni Nielsen, Elsebeth K. Sorensen, Birgitte Holm Sørensen, Oluf Danielsen, and Bo Fibiger (1945-2008). As a newcomer in the field of research, I could not have wished to become a member of a better community of practice. Lone, you continue to inspire as a role model, and I thank you for always believing in me. When you first hired me back in 2003, you asked me to be the students' ambassador - I have tried my best to honour and fulfil that role. Janni, I am forever grateful for your support in relation to my mother's untimely death in 2009, and for having me as a visiting PhD-student. Elsebeth, Birgitte, and Oluf, you all taught me so much about the art of teaching and the joy of learning. When the MIL community lost Bo, we all lost more than a colleague, and I feel certain that I am not alone in missing his wisdom.

I could not have accomplished this research without the participation of 53 MIL students. Even though our journeys together often times were frustrating and exhausting, I know you learned a lot, and so did I. I thank you for being open-minded and always willing to discuss and engage in my pedagogical experiments. I am delighted that so many of you continue to be part of my professional learning network. Special thanks to former MIL students, Roland Hachmann and Inge Knudsen, who have been co-facilitating in two of the research cycles. Our work together has been very inspirational and fun, and I am proud to call you my friends.

I am also indebted to several people in the Department of Communication and Psychology at Aalborg University. Without the support of Ole Prehn (1952-2008), Christian Jantzen, and Mikael Vetner, this research project would never have been realised. Winnie Ritterbusch, Hanne Porsborg Clausen, and Aase Andersen, I owe you all for your continuous help over the years. Many other colleagues at e-Learning Lab and in the MIL community have contributed to my understanding and appreciation of the field, and I feel privileged to have had the opportunity to be part of a very unique research environment. I feel particularly tankful to Malene C. Larsen, and Mayela Coto Chotto whose work continues to inspire me. Heilyn Camacho Nunez, my Costa Rican friend and kindred spirit, it has been an honour to work with you, and I am forever grateful for your support - also on a more personal level.

As member of the e-Learning Lab, I have had several opportunities of meeting Etienne Wenger, and I am grateful for our conversations regarding my research. Getting to know the framework underpinning the social theory of learning, and the communities of practice has had - and continues to have - a huge impact on my thinking and work in the field. It has truly been a transforming experience.

In 2010, I was fortunate to be a visiting scholar with Professor Ruth Tringham in the Department of Anthropology at UC Berkeley, USA, and I am very grateful to have had this opportunity. The scholarship was granted by the Center for Information Technology Research in the Interest of Society (CITRIS) and the Danish Agency for Science, Technology and Innovation (DASTI). I thank, Søren Nedergaard and Lars Beer Nielsen (Innovation Centre Denmark, Silicon Valley, USA) and Henrik Bennetsen (Stanford University, USA) for welcoming me to California, and also for inviting me to the Metaverse-U conference at Stanford, back in 2008 - it became crucial to my understanding of the field.

Since I first entered the virtual world, Second Life, in 2007, I have had the great pleasure and privilege of collaborating, learning and having fun with many international educators, researchers, artists, and entrepreneurs - many of whom have influenced my thinking and practice beyond this research project, and many of whom I am also able to call friends in real life. I thank you all for your generosity. I also want to thank The Maria Curie Sklodowska University, Poland, for letting my use their island in Second Life for my research in 2009.

I am also obliged to my current colleagues and leaders at The Metropolitan University College for taking an interest in my research, and for granting me time and mental space to complete this project.

I could never have done this without the patience, love, and support of my family. Thank you for being in my life!

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CHAPTER 1.
INTRODUCING THE STUDY

In this chapter, I present the purpose of the study and its contribution to the research community. I describe my first experience with the 3D virtual world, Second Life, and how my research interest came about. My study has been designed as an insider Action Research project, and I briefly describe the research background and the educational context, where I have conducted four action research cycles. The study's research questions and problem solving interests are presented. Further, I highlight milestone events that have influenced my personal learning and research trajectory. The chapter also provides an outline of the rest of the dissertation and a glossary.

1.1. PURPOSE OF THE STUDY AND ITS CONTRIBUTION TO THE RESEARCH COMMUNITY

The purpose of this study is to understand and conceptualize the transformation of a particular educational Community of Practice based on the implementation of the 3D virtual world, Second Life™.

The community setting is a course at the Danish online postgraduate Master's programme on ICT and Learning, which is formally situated at Aalborg University. In order to conduct and theorize about the transformation of this community of practice due to the 3D-remediation a research-led Action Research approach has been chosen to enable research with focus on both action and critical reflection carried out in four consecutive research cycles from 2007-2011. 53 master students, one main teacher (me), and several guest teachers have participated in the study, and the findings are based on analysis of asynchronous student discussions, synchronous participant observation, and a group interview. Furthermore, throughout my study I blogged extensively about the students' and my experiences, and these blog posts are a pivotal part of my data archive[1].

The study contributes with knowledge about the influence of the avatar phenomenon and the consequences of 3D-remediation in relation to teaching and learning in online education. Based on the findings, a conceptual design model, a set of design principles, and a design framework has been developed.

[1] My research blog: http://mariis.net

1.2. RESEARCH BACKGROUND

Even though the PhD-project did not officially commence until January 2008, I did some preliminary work, including the first research cycle in 2007 while being employed as scientific assistant with teaching obligations at the Danish online postgraduate Master's programme on ICT and Learning (MIL) at Aalborg University. In the early spring of 2007, the leader of the MIL programme, Professor, PhD Lone Dirckinck-Holmfeld, asked me to investigate the 3D virtual world Second Life (SL), and to consider if this was a kind of technology, that MIL could benefit from integrating into our educational practice.

At that point in time, the MIL programme mainly provided for the teaching and learning activities through asynchronous communication in a conventional 2D virtual environment, FirstClass™ (FC) combined with occasional synchronous communication primarily facilitated via desktop video-conferencing (e.g. Adobe Connect™) and Voice-over-Internet-Protocol (VoIP) technologies (e.g. Skype™).

1.2.1. MY FIRST EXPERIENCE WITH 3D VIRTUAL WORLDS

On March 26th 2007, I logged into SL for the first time as the avatar, Mariis Mills. I had no prior experience with virtual worlds or virtual games, so I did not know quite what to expect. Having been used to navigating and communicating in flat, mainly text-based 2D virtual environments, I was immediately struck by the spatiality of the 3D environment, and I clearly remember feeling both confused, excited, and having a lot of fun on this first day in SL.

As a newcomer to 3D virtual interaction in general, and to SL navigation and orientation in particular, I recall how astonished I was, as I realized that my physical body reacted to the things happening to my avatar on the screen. For example, I noticed that I said "oops" out loud when my avatar bumped into things, and that I literally ducked in front of the screen when another avatar suddenly came flying straight towards my new virtual representation. Back in 2007, new users to SL started on so-called Orientation Islands, where the users had to complete five different exercises to learn basic skills such as movement, navigation and search, text-chat, how to buy things, and how to change the appearance of ones avatar. Only after completion of these exercises would the user be allowed access to the Main Grid, where all the action is. It took me several hours to complete these exercises, and though I laughed at lot during this process, I honestly do not think I would have completed the exercises, had it not been a mandatory assignment. Compared to conventional 2D virtual environments, the learning curve in SL seemed very steep[2] and the pay-off very

[2] While the metaphor "steep learning curve" originally was used as a positive reference indicating proficiency obtained with a minimum of effort and time, the MIL students and I use the metaphor to describe something which is difficult and time consuming to learn.

uncertain, and this was in fact one of the first and most important lessons, I learned concerning this new environment.

Despite the initial challenges, I continued my journey and exploration in SL during the next couple of months, and I became increasingly fascinated by the possibilities for real-time interaction and communication. During this period, I also found myself becoming gradually more connected to my avatar. Initially, this connection did not concern my avatar's appearance. In fact, for a long time my avatar looked as intimidating as she did on my very first day in SL, where I experimented a bit with the default appearance – cf. figure 1.1. below.

Figure 1.1. Mariis Mills on March 26th 2007.

The connection to the avatar was more related to a sense of presence, of being there and quite often the sense of being there together with others. Additionally, the sense of presence also included the ability of doing things inworld, especially the ability to create and manipulate objects both individually and collaboratively. Such a strong sense of presence was not something I was accustomed to from my previous work and studies in conventional 2D virtual environments, and the potential for online education seemed evident.

According to Lee & McLoughlin (2010), one of the major challenges in online education in general, is the inherent "distance" factor. Distance learners are prone to a high dropout risk primarily due to unsatisfactory availability of feedback and teacher contact, insufficient access to student support and services, feelings of isolation and alienation, lack of experience (in tertiary study and/or studying at a distance), and lack of (technical) training (Lee & McLoughlin, 2010).

Even though the MIL programme successfully has overcome the majority of similar challenges through a deliberate inclusive and participatory pedagogical design, I found the immediate sense of presence and not least co-presence that SL and the avatar phenomenon conveyed particularly resilient and engaging, and I started wondering about the pedagogical potentials. What would happen if we tried to transform some of our MIL practice via this new virtual environment, how would participants react to having an avatar as opposed to being represented by text or flat icons, how would the avatars, the environment, and the ability to collaborate real-time influence the teaching and learning processes and outcomes?

1.2.2. IDENTIFYING A RESEARCH INTEREST CONCERNING VIRTUAL WORLDS IN DISTANCE EDUCATION

Released to the public by Linden Lab Inc. in 2003, SL did not gain major educational interest until 2006 coinciding with mainstream media coverage. An observational survey conducted in the spring of 2007 examined the presence of 170 accredited worldwide educational institutions in SL, and found that these best could be identified as "innovators" or "early adopters" according to Rogers' (1962) terminology on technology adoption[3] (Jennings & Collins, 2007).

Initial literature review, conducted in 2007, on the use of SL in Higher Education, Distance Education, and/or Continuing Professional Development clearly confirmed that this was a research field in its infancy[4]. Nevertheless, studies conducted in the most prominent predecessor to SL, Active Worlds™, had shown promising potentials in terms of increased possibilities for social engagement, participation, and co-creation of virtual 3D-objects (Patterson, 2006; Jensen, 2004; Schroeder, 2002; 1999 & 1997). Of particular interest was research by Dickey, who studied and analysed the impact of design affordances and the limitations of implementing Active Worlds (AW) in both formal and informal online education based on a (very broad) socio-constructivist understanding (Dickey, 2005a; 2005b & 2003).

Dickey (2003) found that 3D virtual worlds typically have three important features:

- 3D virtual worlds provide the user with the illusion of 3D space for interaction
- 3D virtual worlds provide the user with a 3D visual personal representation (the avatar)

[3] In his book *Diffusion of Innovations* Rogers identifies five categories of technology adopters along a continuum including innovators (2.5% of the population), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%). (Rogers, 1962 as cited in Jennings & Collins, 2007)

[4] This has since confirmed in later literature reviews (e.g. Dass, Dabbagh & Clark, 2011; Wang & Burton, 2013).

- 3D virtual worlds provide the user with a range of inworld tools making both synchronous and asynchronous communication possible

In relation to the first feature, Dickey noted, that while 3D virtual worlds do not offer the full immersive capabilities of virtual reality (VR), they do offer some level of immersion (Dickey, 2003, p. 106). This indicated that immersion could be a key concept in 3D virtual worlds research. In relation to the avatar, Dickey found that this type of user-representation allow the user to self-identify and to identify others in the 3D environment (Dickey, 2003, p. 109). This suggested that embodiment, presence and co-presence also could be key concepts.

Finally, in relation to the interaction and communication possibilities, Dickey's findings regarding the 3D virtual world's support of socio-constructivist learning (Dickey, 2003) in general, and of situated learning in particular (Dickey, 2005b), revealed that 3D virtual worlds could be an interesting object of study in my particular context. Given that the pedagogical understanding, which permeate our practice at MIL, is highly influenced the by work of Lave & Wenger (1991) and Wenger (1998), here referred to as the Community of Practice framework, Dickey's initial studies seemed promising.

Encouraged by Professor Dirckinck-Holmfeld, I therefore submitted a proposal for a PhD-project aimed at investigating the pedagogical potential of 3D virtual worlds in online education in the summer of 2007. The grant for the PhD-project came through by the end of December 2007, but in the meantime, the steering committee behind the MIL programme had given me permission to conduct a first, exploratory study using SL combined with our existing 2D virtual environment in the fall in relation to a course I was teaching on ICT and Pedagogical Design. This preliminary study provided much useful data, many lessons were learned, and thus I consider it the first research cycle of my project.

Moreover, the use of my own pedagogical practice as object of study and as means to collect empirical data aligned very well with the overall insider Action Research approach (Coghlan & Shani, 2009), I had suggested in the original PhD-proposal. One of the main characteristics of an Action Research (AR) approach is that besides describing and explaining specific social phenomena, this approach also seeks to change existing practice through repeated cycles of action and critical reflection (Reason & Bradbury, 2009; McNiff & Whitehead, 2006; Nielsen & Svensson, 2006). Another important characteristic of AR is its explicit aim to understand the people under investigation, their practices, and their meaning making by including them actively in the research process – typically by submitting them to change. Furthermore, the researcher herself is actively involved in the research as well. These final points suited well with the implementation of a new virtual learning environment (SL), which I could introduce in my already scheduled courses at MIL.

1.3. RESEARCH QUESTIONS AND PROBLEM SOLVING INTERESTS

Based on the premise that all elements in a given practice influence each other in a dialectical relationship, and that the introduction of a new virtual environment therefore will change the structure and the outcome of the practice, the purpose of this study is to investigate the interplay between practice and design. In this study, I have adopted the concept of remediation (Bolter and Grusin, 1999) as a way of speaking of the design process in order to rethink, reframe, and reform prior practice, and I will return to this in chapter four. According to Wenger (1998, p. 233), "practice is a response to design" and this assumption has guided the formulation of the study's main research questions:

> RQ1: How do students in a pedagogical Community of Practice respond to avatar-mediation and transformation of practice in the 3D virtual world, Second Life?

Additionally, a second research question emerged after the first research cycle:

> RQ2: How can design for learning be conceptualized and implemented to facilitate meaningful participation and reification for students in the 3D virtual world, Second Life?

Action researchers, McKay & Marshall (2001a) recommend scholars to keep the dual imperative of AR in mind when designing and conducting AR projects. As such, the research is obligated to focus on both research interests and problem solving interests simultaneously throughout the study. The first research question, based on the initial research interest (RI), remained constant throughout the study. Further, based on the first research cycle an additional research question emerged. It should be noted that my study is characterized by being research-led (McKay & Marshall, 2001b), meaning that my initial interest stemmed from a research curiosity, not a predefined real world problem. New areas of interest arose continuously throughout the study, and these areas and associated problems are defined as distinct problem solving interests (PSIs) in relation to each cycle. I will return to the dual imperative of AR in chapter three, but for now table 1.1. (next page) provides an overview of research cycles, and the research and problem solving interests in the study.

Research Cycles	Research interest RI-cycle	Problem solving interest PSI-cycle
MIL07-MIL10	RQ1: How do students in a pedagogical Community of Practice respond to avatar-mediation and transformation of practice in the 3D virtual world, Second Life?	
MIL07	Explore SL as virtual learning environment (VLE), and its general impact on the MIL community.	
MIL08-MIL10	RQ2: How can design for learning be conceptualized and implemented to facilitate meaningful participation and reification in the 3D virtual world, Second Life?	
MIL08	Study SL as VLE, and the impact of activities on the MIL community.	PSI1: How can design of inworld activities solve the problem with lacking engagement and participation in SL?
MIL09	Further study SL as VLE, the impact of specific activities, and a new assessment method on the MIL community.	PSI2: How can design of an inworld assessment method solve the problem of discrepancy between participation and reification in SL?
MIL10	Further study SL as VLE, the impact of specific activities, a revised assessment method, and an enhanced domain-practice relation and a transformation of the overall practice in the MIL community.	PSI3: How can design of the MIL course focused on enhancing the domain-practice relation solve the general problems of transformation of practice in SL?

Table 1.1. Overview of research and problem solving interests.

It should also be noted that my initial research interest was based on my preliminary empirical experiences. As such, I did not start out with a hypothesis or a predefined theoretical framework to guide the design of the course. Instead I decided to apply a Grounded Theory-inspired approach (Glaser & Strauss, 1967) to generate and analyse data, which also will be further elaborated in chapter three.

1.4. MILESTONES IN MY PERSONAL LEARNING AND RESEARCH TRAJECTORY

This dissertation marks the end of my journey toward becoming a full member of the academic research community. Essentially, a PhD-project is a learning project, and this holds especially true for AR projects. According to McNiff & Whitehead (2006, p. 13) the purpose of AR "is to generate living theories about how learning has improved practice and is informed by new practices". To this end my personal learning becomes relevant, and unlike more conventional research projects, I will include and reflect upon my personal learning experiences as well as that of the participants in the study. In retrospect, my personal learning trajectory has been influenced by several milestone events, some of which precede the actual commencement of the PhD-project in January 2008, and some of which have influenced my research in an indirect, but nonetheless important manner.

As already mentioned, this study has been undertaken as an insider Action Research project, which means that I have conducted the research in my own organizational setting. The underlying research paradigm, and the methodological assumptions and consequences connected to this type of research project will be dealt with in detail in chapter three. However, I also believe that a more personal account of my pre-understanding, the lived experience I bring into this study, will provide valuable insights for the reader in terms of understanding my general beliefs and choices.

As a newcomer to the field of 3D virtual worlds and games, I was fortunate to participate in a seminal conference called The Metaverse U at Stanford University only a few months after my PhD-period officially started in February 2008. Many of the prominent figures in the field participated (e.g. Raph Koster, T.J. Taylor, Jeremy Bailenson, Wagner James Au, and Corey Ondrejka – all of whom I have been inspired by in the dissertation) and thus provided me with a valuable overview. As it happens, the event was streamed simultaneously into SL, and I made many new inworld friends during the conference. Both in 2008 and in 2009, I participated in the Second Life Community Conventions, where hundreds of SL avatars met in real life. These conventions also helped me cultivate my personal and professional learning network. Many of the SL friends I met in real life also participated in my courses as either guest teachers or visitors, and as such they have played an important role in my pedagogical design and research process.

During the 2009 SL convention, which took place in San Francisco, I also had arranged to meet with Professor Ruth Tringham from UC Berkeley to discuss the possibility of becoming a visiting scholar in the Department of Anthropology. Based on a grant from the Danish Agency for Science, Technology and Innovation (DASTI), I visited Professor Tringham for a couple of months in the spring of 2010. The purpose of my stay was mainly to study the concept of remediation and its applicability to virtual worlds design and research, which I will return to in chapter four.

Figure 1. 2. Meeting SL author Wagner James Au at the SLCC09.

From 2008-2009, I participated in a EU-funded research project called Community of integrated blended learning in Europe (COMBLE). In this project we also used SL as multi-user virtual environment, and an AAU colleague, Heilyn Camacho, and I designed, implemented, and evaluated a course on problem-based learning in SL (e.g. Riis, 2009, October 4th; Riis, 2009, September 27th). One of the project partners, The Maria Curie Sklodowska University in Poland, bought an island in SL, which I was allowed to use in one of my research cycles.

In the fall of 2011, I participated in another small research project in collaboration with Universidad Nacional (UNA), Heredia, in Costa Rica. In this project I also designed, implemented, and evaluated a course in SL, with Heilyn Camacho and my SL friend, Inge Knudsen (e.g. Riis, 2011, August 23rd; Riis, 2011, September 13th). Both research projects provided me with additional insights as many of the challenges we faced in these courses were similar to the once I faced in my own study. Participation in these projects also allowed for me engage with 2nd person voices in my research, which as we shall see in chapter three is an important part of doing AR.

In 2009, I was also invited to participate in a small research project on the applicability of the Community of Inquiry model in SL by Terry Anderson, Ross McKerlich and Brad Eastman from Athabasca University (Riis, 2009, June 24th). Based on this collaboration Anderson, McKerlich and Eastman visited one of my classes in 2009, and I included theory about the model in the course syllabus, which I will return to in chapter two and five.

Figure 1.3. Discussing the call for the 2011 VWBPE conference.

Throughout my PhD-period, I have participated in many networks, seminars, and conferences with other researchers, which is an expected part of being a scholar. In my case, however, most of these activities have taken place inworld. As an example, I have participated in the annual Virtual Worlds Best Practice in Education (VWBPE) conferences several times over the years. In the 2011 VWBPE, I participated with a panel discussion together with three SL friends and researchers, Mark Childs (UK), Liz Dorland (USA) and Robin Heyden (USA), and we did all of our planning and collaboration inworld (Riis, 2011, March 9th). While there is nothing exotic about collaborating exclusively online, my point here is that many educational researchers in SL actively seek to "practice what they preach" and they become learners themselves. Through SL I have gained access to and been able to participate in and learn from a global community of educators and researchers unlike any other community I have come across elsewhere.

1.5. OUTLINE OF THE DISSERTATION

The dissertation has been organized in seven chapters besides this first introducing chapter. In the following *chapter two*, I provide a state-of-the-art review of *3D Virtual Worlds*. The review first provides a conceptual background for the study. Building on predominantly extant literature, central concepts pertinent to understanding the phenomenon of 3D virtual worlds are highlighted. In the second section, I analyse recent reviews of virtual worlds' research focusing on elements relevant to educational research in SL.

The purpose of *chapter three* is to present the *Design of the Study*. In this chapter, I describe my research approach elaborating on central aspects of Action Research and Grounded Theory. I explain how I have generated a data archive based on engagement in the research cycles and on engagement in my personal and professional learning network.

In *chapter four*, *Context of the Study*, the goal is to further elaborate on the research context. I present the educational setting in terms of The Master's programme on ICT and Learning (MIL). Focusing on the pedagogical background and foundations of MIL, I am also able to present elements of the communities of practice framework, which has inspired and influenced the study.

Chapter five, *Transformation of Practice*, is based on my empirical work (part 1) and presents the transformation of practice in the four research cycles MIL07-MIL10. In relation to each research cycle, I describe the design and the actions taken in order to study specific research interests and from MIL08 to solve specific problems that had occurred in previous cycles. The findings in this chapter are by and large based on our (the students and I) grounded experiences, whereas my analysis and reflections are inspired by elements of the communities of practice framework.

Chapter six, Responses to Avatar-mediation, is based on my empirical work (part 2) and presents the students' responses to the avatar phenomenon. The students' responses are described in relation to two dominant perspectives: avatar appearance and avatar behaviour. The findings are analysed in relation to a variety of literature relevant to sub-topics within each perspective. Based on a combination of findings from chapter five and six, I propose a framework for 3D-remediation of pedagogical practice.

Finally in *chapter seven, Conclusion and future research*, I summarize the answers to the two main research questions and highlight the study's contribution to knowledge. I reflect upon the methodological foundations of the study, and point to limitations. Lastly, make suggestions for future research.

1.6. EXCLUSIONS AND CONVENTIONS

Anonymity and pseudonyms

Unless otherwise stated, all participants in the study are presented anonymously, typically by using their chosen SL names. This is the case with all students but two, who have granted me permission to disclose their real names as they participated in my study as co-facilitators and technology stewards, and I wish to credit them appropriately. Former MIL08 student, Roland Hachmann (Mew Aeon in SL) was invited as co-facilitator and technology steward in the MIL09 cycle. Inge Knudsen (Inge Qunhua in SL) has been an inworld friend and fellow educator almost since my first steps in SL. Inge has been very helpful as a technology steward in all research cycles, even in the MIL10 cycle, when she was enrolled as a MIL student.

In relation to other participants (e.g. educators we visited in the research cycles), I usually refer to both their real life names (if they stated these in their SL profiles and/or gave me permission) and their SL pseudonyms. In some cases, I never learned the "real" identity behind the avatar. One such example is my friend, ArminasX Saiman, whom I met numerous times inworld and twice in real life at the Second Life Community Conventions. I never knew his real life identity, and it never really mattered.

Didactics

This study investigates the creation and implementation of a design for teaching and learning remediated in the 3D virtual world, SL. In a Scandinavian or German academic tradition, such a study would be situated within the field of Didactics. However, according to Hamilton (1999) and Schnack (2000), in the Anglo-American mind, the term "didactic" may have very negative connotations implying a moralizing and heavily teacher driven approach to teaching and learning. Professor emeritus, Karsten Schnack from the Danish School of Education (Aarhus University) therefore recommends Danish scholars to avoid using the term when communicating in English (Schnack, 2000). However, at MIL, we often use a didactic-based terminology (e.g. we speak of didactic elements, didactic analyses, and didactic design), at least when we communicate in Danish. Despite our terminology, we do not necessarily adhere to the Anglo-American perception. Nonetheless, to avoid misunderstanding, I have decided to use the more neutral concepts of "pedagogy", and "design for teaching and/or learning" when speaking about matters concerning the field and the process of designing.

Multi-sited, online ethnographic approach

In this study, I have employed what I would call a multi-sited ethnographic approach to generate data. It is, however, important to notice that the scope of this study does not extend to a consideration of the participants' offline experiences while being online in either FC or SL, nor have I collected any (substantial) data offline. If anything, the implicit comparison in this study is between the participants' experiences in 2D vs. 3D virtual environments, not between off- and online settings. This research approach will be further dealt with in chapter three.

Real vs. virtual

For simplicity, I have decided to assume the use of the real vs. virtual dichotomy as a way of distinguishing between the two types of reality based on a materiality level, meaning that real and real life (commonly abbreviated RL/IRL by the participants in the study) refer to reality experienced in the physical world outside SL. As I will discuss in chapter two, this intends no inherent qualitative distinction: real life is not per se better, more authentic, or more genuine than virtual life.

1.7. GLOSSARY, INCL. ABBREVIATIONS

Term	Explanation
Away-from-keyboard (afk)	A term used to denote that the user is not (currently) paying attention to online activity.
Alternative (alt)	A term used to denote the user's avatar(s) other than her main avatar.
Instant Message (IM)	The chat function in Second Life. Can be used privately or publically (local chat).
Landmark	Designated location marker in Second Life - sharable.
Inworld	Commonly used to refer to things happening inside a virtual world.
Island	Designated location in Second Life.
Linden dollar	The monetary currency in Second Life.
Linden Lab (LL)	The company behind Second Life.
Main grid (or simply grid)	The main area for activities in Second Life - consists of thousands of islands.
Newbie, n00p	Newcomer.
Oldbie	Old-timer.
Sandbox	A designated free building area in Second Life. Typically there are sandboxes on all islands.
Sim, simulation	Another term for island or designated location.
SLurl	A link to a designated location in Second Life - sharable.
Viewer	The graphical interface (GUI) of Second Life.
Teleportation (tp)	A way of moving/transporting the avatar.
Prims/primitives	Building blocks in Second Life.

Table 1.2. Glossary

CHAPTER 2.
3D VIRTUAL WORLDS

As mentioned in chapter one, I have chosen a Grounded Theory-inspired approach (Glaser & Strauss, 1967) to generate and analyse data, which means that I did not start out with a predefined theoretical framework. I will return to this in chapter three on the design of the study. Nonetheless, the role of theory, and consequently the traditional academic literature review in dissertations, is continuously debated among Grounded Theory-researchers (i.e. Giles, King & de Lacy, 2013; Dunne, 2011; Dick, 2007). Even so, there does seem to be consensus on the need to conduct some form of literature review after the data collection and initial analyses - typically on extant literature.

Accordingly, this chapter presents a state-of-the-art review (Grant & Booth, 2009) of 3D virtual worlds, as seen from two different perspectives. In the first section, I present a conceptual background for understanding the phenomenon, mainly based on extant literature. Themes covered are virtuality vs. reality, virtual world history and evolution, virtual world design and user-typology, and finally a sub-section on multi-user virtual environment ecology. In the second section, I present recent research on 3D virtual worlds, concentrating on research relevant to SL and my study. Themes include research trends, topics, and significant findings related to educational research. In both sections, key concepts are emphasized. Given that this review has been conducted after my data generation and the preliminary analyses, I am able to combine the research findings, in both sections, with my own observations and critical reflections.

2.1. 3D VIRTUAL WORLDS - CONCEPTUAL BACKGROUND

In a recent talk about the history of virtual worlds, Raph Koster, a highly recognized developer of game worlds and author of "Theory of Fun for Game Design" (2004), offered a piece of important advice to current virtual world developers and others engaged in field:

> As those of you working in VR charge off to build your worlds, heed the lessons from your forebears: from whence you came, so shall you be; the future is, still, MUDdy. (Koster, 2016).

Consequently, in this section, I provide a glimpse of how virtual worlds began, how they have evolved, and how they can be conceptualized. The section includes a discussion of virtuality vs. reality, virtual world history and evolution, virtual world

design and user-typology, and finally a sub-section on how virtual worlds can be considered part of multi-faceted, multi-user virtual environment ecology.

2.1.1. VIRTUAL AS PROXY FOR THE MATERIAL

According to ethnographers, Tom Boellstorff, Bonnie Nardi, Celia Pearce & L.T. Taylor, all of whom, my study has been inspired by, the notions of virtual have played an important part in human history and "can be traced back to cave paintings, Greek and Chinese thought, and among Aboriginal cultures throughout the world" (Boellstorff et al., 2012, p. 22). The rise of digital mass media, science fiction and fantasy literature, and films are among the most recent and important influences in terms of shaping our understanding of the virtual.

In her book "The Virtual Window – from Alberti to Microsoft", Anne Friedberg explores the window as metaphor, as architectural component, and as an opening to dematerialized reality. I will return to the window vs. world metaphor on several occasions, particularly in chapter four and six. In the first chapter, Friedberg sets out to define virtual because "in the glare of a jargon-ridden present, the term "virtual" may have lost its descriptive power", and she hopes "to reclaim its considerable utility for making distinctions about the ontological status – and materiality – of an object" (Friedberg, 2006, p. 7). To start off her endeavour, Friedberg presents the following definition from Webster's (1993) Third New International Dictionary Unabridged:

> Virtual (Latin, virtus, for strength or power) of, relating to, or possessing a power of acting without the agency of matter; being functionally or effectively but not formally of its kind. (Friedberg, 2006, p. 8)

Subsequently, Friedberg (2006, p. 9-10) highlights the following points that I found of particular interest for my study: a) the virtual is a substitute – "acting without agency of the matter" – an immaterial proxy for the material, and b) a virtual object has a materiality and a reality but of a different kind, a second-order materiality, liminally immaterial.

Friedberg further explains that for the purpose of her research: "the term "virtual" serves to distinguish between any representation or appearance (whether optically, technologically, or artisanally produced) that appears "functionally or effectively, but not formally" of the same materiality of what it represents" (Friedberg, 2006, p.11). It is important to notice that Friedberg mentions different production forms, which of course highlights her point that virtual does not apply to technology-mediated objects and experiences only. From Friedberg's definition follows that a virtual world could be any kind of representation of a world that appears "functionally or effectively, but not formally" of the same materiality as the world it represents.

Figure 2.1. Interacting with Facebook from within SL.

For the time being, it is noticeable that the only thing we learn about virtual worlds is that they are of a different materiality than the ones they represent, and if we want to know more about a particular virtual world, we need to add more to the definiendum i.e. 3D, computer-based, social, immersive etc. My interest in this study is focused on 3D computer-based virtual worlds, which means that these worlds are generated from software, designed as interactive computer graphics in three space dimensions.

Perceptibly, so-called 3D computer-based virtual worlds are represented on a two-dimensional screen, and only if the user is able to suspend disbelief and become immersed into the virtual world, will she experience the represented world as being three-dimensional through a sense of presence. Whether or not the user experiences a virtual world as real can be explained by a concept called psychological relativity. According to Blascovich & Bailenson (2011), reality is, strictly speaking, constructed by the mind, and if the mind buys into an experience, it deems it real. This means that the distinction between real and virtual is relative, but:

> Humans contrast what is usually considered "grounded reality" - what they believe to be the "natural" or "physical" world - with all other "virtual realities" they experience, such as dreams, literature, cartoons, movies, and online environments such as Facebook or Second Life. This contrast allows us to avoid being mired in the unending debate over what constitutes reality. (Blascovich & Bailenson, 2011, p. 15-16 - original emphasis)

Importantly, Blascovich & Bailenson observe that people differ in their perceptions of reality, but "they often experience and believe the illusory to be real" (Blaschovich & Bailenson, 2011, p. 16). This is in concurrence with Dickey (2003), who mentioned the

provision of "the illusion of 3D space" as one of the main features - and attractions - of 3D virtual worlds (cf. chapter one).

Factors that affect immersion and presence are not isolated to psychological states-of-mind, but also depend on the physical environment and the technology itself. Modes of communication and interaction and level of user-control (of self and environment) have long been regarded significant to the overall user-experience (Sallnäs, 2002), making it relevant to look closer at the features of 3D computer-based virtual worlds[5].

3D computer-based virtual worlds have been around since the mid 1990's, and in an article published in 1999, Jensen lists a number of features for this particular kind of worlds that still are applicable nowadays. As proxy for the material world, a 3D computer-based virtual world has general characteristics that I find are compatible to SL, as shown in table 2.1. next page.

3D computer-based virtual worlds like SL share many similarities with the real world in terms of being inhabitable spaces with interacting actors or users. Importantly though, most characteristics in SL are user-controlled, meaning the user can manipulate the world and its content to a very large extent, according to her preferences[6]. In fact, SL itself has become recognized as being unique in terms of the numerous possibilities for interaction, creation of inworld objects, and the level of control it offers to its users (Wang & Burton, 2013). As a somewhat peculiar example, Yee & Bailenson (2007) found that the SL viewer, pr. default, offers more than 150 unique sliders (options) for changing anything with regard to the avatar's appearance (i.e. hair, body shape, and clothes).

Additionally of interest to this study are the rules by which the world is defined, as these in many ways determine, how users can inhabit, experience and thus make sense of the world. As Jensen states:

> Each world represents a specific vision of what a virtual world can be and which experiences it can afford its inhabitants and users. Virtual worlds thus have their own ontology since all conceivable forms of existence seem to be possible within them or more precisely: the nature of being is here only limited by the current technology and imagination. (Jensen, 1999, p. 4)

[5] Since Sällnes' contribution to the seminal book "The Social Life of Avatars - presence and interaction in shared virtual environments" back in 2002, *graphical fidelity* has become another important and highly debated feature following the technological advances in the field. As we shall see, my data illustrate the importance of high fidelity in relation to the user's inworld experience.

[6] As appealing, as this might sound, from an instructional perspective, this is a huge challenge given that every single user experiences the world from a unique point-of-view (invisible to others). I will return to this in my analyses.

General characteristics	Second Life characteristics
The world is coordinate-based.	In SL, coordinates are always visible in the viewer, and they are used to create SLurls (direct links to particular places inworld) and landmarks that can be shared in- and out of world.
The world is geometrically finite.	In SL, demarcated "islands" make up the world. Islands can be isolated or organised in clusters.
The world is navigable.	The SL user can move seamlessly by walking, running, or flying (typical for short distances) and through teleportation (typical for longer distances).
The world is defined by a set of "physical", "biological", "social", etc. rules that define how users may move, interact, and communicate.	SL has real world characteristics in terms of gravity, daylight rhythm, and 3D sound. In SL the user is - pr. default via her avatar - able to sit, walk, run, jump, and fly. Additional moves (i.e. dancing, kissing, sport performance moves) can be purchased. The SL user can text-chat and use VoIP both privately and publically. A part from the official Terms of Service, there are a number of social rules - often specific depending on community culture.
The world is populated by objects and actors (bots and avatars).	Almost all content in SL is user-created, and objects like trees or furniture are built by combining virtual building blocks called "prims". Bots are autonomous agents, bits of software, which run on their own, programmed, but otherwise independent of user-control. They can assume avatar characteristics (move or communicate). Avatars are the users' virtual inworld representations that can be customized and manipulated. The user controls the avatar in real time. In SL, avatars are commonly referred to as "residents".

Table 2.1. Characteristics of 3D computer-based virtual worlds.

Different virtual worlds have different rules and ontologies. Except for a period around 2009[7], the marketing slogan of SL has always been "Your World, Your Imagination" denoting the users' freedom to create this new world restricted only by their own imaginative capabilities. Also worth noticing, is the SL Eye-in-Hand logo, as seen in figure 2.2. (next page), which signifies the bond between sight and touch, between seeing and creating.

[7] In August 2009, in relation to the launch of a new official SL website and a changed trademark policy this slogan was removed - as I understand it mainly due to intellectual property issues. The changes were revealed in the late fall of 2008 an caused a heavy debate among many SL users and in the social media sphere as exemplified in a blog post by Scholz (2008) entitled "It's not your world anymore". It is unclear, to me, when the slogan came back.

Figure 2.2. SL's slogan and logo.

To better understand the concept of virtual worlds, we need to take a closer look at how they came to be and have evolved. Inspired by Dionisio, Burns & Gilbert (2011) and Smart, Cascio & Paffendorf (2007), table 2.2. below provides a brief overview of milestones in the evolution of 3D virtual worlds. As shown in table 2.2., computer-based virtual worlds have been around for decades. In the overview, I have chosen to highlight the milestones with regard to open-ended worlds as opposed to game-based worlds, even though they clearly share history. As we shall see, in open-ended virtual worlds, such as SL, there is no constituting backstory or predetermined purpose for engaging in the world, and to me, this is one of the most important and defining characteristics.

Milestones in the evolution of computer-based virtual worlds	
1970's	First 2D, text-based virtual worlds MUD1, 1978 - Multi-User Dungeons – 2D game world
1980's	First 2D, graphical virtual worlds Habitat, 1986 – fairly open-ended, users were referred to as avatars TinyMUD, 1989 - first completely open-ended text-based world
1990's	First 2.5D (isometric) virtual world Web World, 1994 – open-ended, building capabilities First 3D Virtual World Worlds Inc., 1995 – open-ended, building capabilities (AlphaWorld) ActiveWorlds (AW), 1995 – open-ended, users were expected to customize their avatars and build the world OnLive! Traveler, 1996 – open-ended, first native spatial voice chat

Continues next page ...

2000's	Continued development of 3D virtual worlds 2003, Second Life (SL) – open-ended, advanced user-capabilities, content-creation tools, and virtual economy 2005, Solipsis – first open-source decentralized (2D) virtual world system 2007, SL's source code is released 2008, Imprudence/Kokua – first open-source viewers based on Second Life code 2009, OpenSimulator – first project to connect multiple servers using the same (SL-based) virtual world protocol (standalone or hypergrid mode) 2009, BlueMars – open-ended, closed-source virtual world, but higher graphical fidelity
2010's	Continued development of 3D virtual worlds, but also renewed focus on combining virtual reality (VR) equipment with the use of these worlds

Table 2.2. Milestones in the evolution of computer-based virtual worlds.

SL was created by Linden Lab Inc. in San Francisco, California and released to the public in 2003 (Yi, 2003). Over the years, Linden Lab has continued to develop SL, and in 2007 the source-code was released making it possible for other virtual world developers to create spin-offs and mash-ups. Linden Lab has also expanded its activities and worked on other products (e.g. Creatorverse for iPad). Currently, Linden Lab is working on a project called Sansar that seeks to combine a higher fidelity SL-based world with VR though the use of head-mounted displays such as Oculus Rift accessible via personal computers, and ultimately mobile devices. In this respect, Linden Lab's continued development of SL, perfectly illustrates the general evolution of computer-based virtual worlds. Even though SL was not developed specifically with education in mind its open-ended possibilities caught the attention of educators worldwide across a wide array of disciplines and levels in the educational sector. Linden Lab has developed a number of case studies of higher education institutions that use SL that are available on its homepage, where it also provides specialized help for educators. According to recent reviews on virtual worlds research, SL continues to be one of, if not the most researched open-ended world in education (Beck & Perkins, 2014; Wang & Burton, 2013). To understand this attraction, a more detailed account of the history of virtual worlds is instructive.

2.1.2. VIRTUAL WORLDS: A MUDDY AFFAIR

In chapter one, I chose to define SL simply as a 3D virtual world, which is in correspondence with the developers of SL. According to one of the co-founders, Cory Ondrejka, virtual worlds represent a new category of digital experience different from games, most notably because virtual worlds such as SL have no game fictions or levelling:

> Strong game fictions mean the games take place within relatively cohesive settings that discourage intermingling with the real world. Fantasy motifs are

> common, but certainly not the only option. Levelling is the process of measuring progress via increases in experience points. These experience points are gained by activities appropriate to the level, and each new level grants the player access to new abilities or game features. (Ondrejka, 2008, p. 230-231)

While recognizing the close relationship to games due to shared history, technology, vocabulary, and oftentimes customers, Ondrejka continues to delineate the difference:

> Virtual worlds are something different. While still massively multiplayer, meaning that thousands of players simultaneously experience the world in a shared space, they possess neither strong fictions nor levelling. Instead, their defining characteristic is the ability of residents to generate creations of value within a shared, simulated, 3D space. Strong, predefined fictions are not appropriate, as they limit the design space available to the residents. Instead, residents create their own fictions and communities, imbuing them with meaning through interaction. (Ondrejka, 2008, p. 231)

Although I fully agree with Ondrejka that SL is not a game, precisely because there is no gameplay in terms of i.e. pre-determined context, goals of use, roles and rules of interaction, progression, and quantifiable outcome, the differences between games and other types of virtual worlds are indistinct, and there is no consensus on how to define either. To further complicate matters, Professor, Richard A. Bartle, whom among many both scholars and practitioners in the field, is widely recognized as the co-creator of the first computer-based virtual world (MUD1 in 1978), refers to games as virtual worlds. On the first page in his seminal book from 2004 "Designing Virtual Worlds", Bartle proposes a definition of virtual worlds:

> Virtual worlds are implemented by a computer (or networks of computers) that simulates an environment. Some – but not all – entities in this environment act under the direct control of individual people. Because several such people can affect the same environment simultaneously, the world is said to be shared or multi-user. The environment continues to exist and develop internally (at least to some degree) even when there are no people interacting with it; this means it is persistent. (Bartle, 2004, p.1)

According to Bartle virtual worlds began as computer games, which explains why much of the vocabulary used to describe virtual worlds is games-based:

> Thus, the human beings who interact with the simulated environment are known as players rather than users; the means by which the environment introduces goals for the players is called gameplay; the activity of interacting with the environment is referred to as playing. (Bartle, 2004, p.2 – original emphasis)

Further, Bartle explains that the first virtual worlds were text-based and known as Multi-User Dungeons (MUDs), and although "all these persistent, shared, computer-based environments can and should be referred to as MUDs, the term is sufficiently loaded that outside the cognoscenti it is unlikely to be universally interpreted this way", and Bartle therefore prefers to adopt the "more descriptive and less emotive" concept of virtual worlds (Bartle, 2004, p. 3). Based on Bartle's initial characteristics of virtual worlds, which in the first chapter includes a review of what easily could be perceived as computer-game history, it is interesting to see why Bartle dismisses the term "game".

Bartle, in fact, devotes the book's sixth chapter entitled "It's Not a Game, It's a …" to explaining why he has abandoned the term. The beginning of the chapter reveals the core argument:

> Virtual worlds began as games. However, right from the beginning – MUD1 – it was clear there was more to them than being mere games. Trying to convince people to take what they considered to be a "game" seriously was problematical, though. In academic circles, the only intellectual acceptable games were traditional ones, such as chess and checkers. A new game was not a worthwhile object of study. Playing games was a waste of computer resources. Thus, virtual worlds became "simulations" – and far more respectable! (Bartle, 2004, p. 473)

Bartle's need to distance himself from the game terminology was essentially due to public misconceptions of games as unserious contexts and activities, and hence unworthy of serious, academic studies. While this argument certainly seems valid in a historic perspective, games have since become recognized as a field of study in its own right, incl. focus on both leisure and more "serious" activities such as education. Nonetheless, many users and developers of games continue to refer to these virtual environments as virtual worlds, oftentimes distinguishing between game worlds (based on gameplay) and social worlds (with no gameplay). In the aforementioned talk, on the history of virtual worlds, Koster (2016) also makes this distinction, characterizing SL as a social world.

Throughout my study in SL, the question of how to define this virtual environment was debated both among the students and I, and at inworld conferences, seminars and informal gatherings, and in May 2012, I decided to write a blog post about my ponderings (Riis, 2012, May 6th). In this blog post I mentioned the different perspectives as stated by Bartle and Ondrejka above, and the post generated many comments from other SL users. One of the first comments came from a user, who did not consider SL a game because:

> (...) If Second Life was a game, you would be able to find high score lists and walkthrough's all over the Internet. (Mirror World, May 6, 2012 at 7:12 pm)

As we see, Mirror World, made the common distinction based on whither the world was defined by game metrics or not. Another user, who also was a player in game worlds described his/her experience with early MUDs, which he/she also considered to be worlds:

> One of my pleasures was writing elaborate "dungeons" or text-based virtual worlds – assembling an entire landscape, castle grounds and rooms from text & the imagination of the users/players. I included theme, persistent logic, mythological content, computer tropes & etc. in environments that could have up to 7 PAGES of description for major "rooms." They were simultaneously a "game" (find your way around, determine the layout of the room/ castle/grounds) and a short story filled with cultural referents and fantasy-SF themes. I still consider those "virtual worlds" as much as VRML, Second Life, OSGrid or EVE Online. (Miso Susanowa, May 7, 2012 at 3:46 am)

Aside from giving an interesting account of how early text-based game worlds could be perceived, Miso Susanowa's experience clearly shows how a virtual world could be any kind of representation of a world that appears "functionally or effectively, but not formally" of the same materiality as the world it represents, as stated above. Another user, Pep, argued that SL is what you, as a user, decide it should be:

> Of course it's a game! Apart from the fact that Life is a game, which makes Second Life – or any other virtual world that is a subset of Life – a game, as soon as one participant treats anything as a game it becomes a game, regardless of how it is perceived by the others that are impacted by that gaming participant. (Don't distinguish games as being less than serious; real life warfare is also a game.) (Pep, May 7, 2012 at 7:21 am).

While I still disagree that SL is a game (pr. design), I do think Pep makes a very important point in that it can be treated as such, and fact of the matter is that game communities do exist inworld. In particular role-playing games are popular (Au, 2008), and entire clusters of islands are devoted to gaming activities of all sorts (Boellstorff, 2008; Sixma, 2008). Tim Johnson, another SL user, joined the conversation with yet a different perspective on SL as a communication device:

> Sorry to come so late to the discussion. I would like to offer another perspective. I use SL almost only for work, I consider it a communication device just like Twitter, Facebook, etc. SL has different affordances, it can be used for whatever you want, a meeting, a game, a social networking area but it is basically a communication device – not a game :) (timjohnson, May 9, 2012 at 1:32 pm)

This blog conversation consisted of 30 comments (excl. my 10 responses), and included eight different users. While this by no means is a representative sample of the SL user population, the conversation does illustrate the lack of consensus in defining virtual environments such as SL. Furthermore, it is a typical example of how I used my blog to engage 2nd person voices in my research. Even though this was not a traditional academic conversation, it did contribute to my understanding of the phenomenon, and in this particular blog conversation, I was fortunate to be joined by Richard Bartle himself:

> If you want to know more about the historical relationship between game worlds and social worlds, you should look at the "great schism" of around 1990 where the two parted company. See this presentation on my website. It was aimed at a game designer audience, but if you stick with it you'll get the picture. If you want the academic paper that resulted from it, let me know and I'll email it to you (or you can read it here[8]) (richardbartle, May 11, 2012 at 8:40 am)

As we shall see in sub-section 2.1.3., I accepted Bartle's invitation to investigate some of his other writings, which led to further understanding of virtual worlds and the "great schism". For now, what is interesting is that Bartle, in the comment above, maintained the distinction between game worlds and social worlds. Another prominent figure in the field, Professor Sara de Freitas, who has done extensive research in both types of virtual environments, published a scoping study on "Serious Virtual Worlds" in 2008. In this study, de Freitas groups existing virtual world applications in five categories:

1. Role-play worlds. Also referred to as multi-player role-play online games - WoW is listed as an example.
2. Social worlds. Also referred to as open-ended exploratory immersive worlds - SL is listed as an example.
3. Working worlds. Also referred to as cooperate and business 3D spaces and intranets - Project Wonderland is listed as an example.
4. Training worlds. Also referred to as 3D training simulations and serious games - Croquet is listed as an example.
5. Mirror worlds. Also referred to as geo-spatial databases and mapping services - Google Earth is listed as an example. (de Freitas, 2008, p.11)

While fully recognizing that these categories are "inherently problematic" considering the applications are constantly evolving, changing and converging[9], de Freitas still uses the game vs. social distinction (de Freitas, 2008). The authors of the seminal "Metaverse Roadmap" also find the distinction somewhat misleading, because:

[8] This comment included two links.

[9] PokemonGo is a current (2016) example of an application that would be hard to categorize in this way, since it entails both mirror world features (augmented reality) and gaming elements.

> In practice, the game vs. social world distinction is often blurred, as goal-directed games always emerge in social VWs, and as social experiences broaden inside the more popular game worlds. (Smart, Cascio & Paffendorf, 2007, p. 7)

To further understand the dissimilarities and similarities between the different types of virtual worlds, looking at the ontology, as it is expressed through design and consequently user-typology, will offer additional insight.

2.1.3. 3D VIRTUAL WORLDS - DESIGN AND USER-TYPOLOGY

As mentioned above, Bartle pointed my attention to one of his articles entitled "Alice and Dorothy play together" (2009), which led to another blog post (Riis, 2012, May 20th). In this article, Bartle describes three philosophies or design approaches that have influenced the work of designing virtual worlds. Based on three major fictional works, Alice in Wonderland, Dorothy from Oz, and Wendy in Neverland, Bartle (2009) identifies differences and commonalities between the worlds. Designers of early virtual worlds, in the 1970's, took the Alice approach and provided the players with an overall objective based on a developer-created backstory. Players in Alice-worlds were then left to create their own stories, explore the environment and themselves, and the fun was in the journey, not in the arrival (Bartle, 2009, p. 105). Roughly a decade later, in 1989, the "great schism" occurred with the creation of TinyMUD in which the game aspect was explicitly and entirely removed, and as Bartle states:

> It was a playground, rather than a game. There was therefore never any pretense that such worlds might be anything other than adjuncts to reality. Their players had much the same view as Wendy in Peter Pan (Barrie, 1911), for whom Neverland was an extension of her own imagination. (Bartle, 2009, p. 105.)

In reaction to the anti-game Wendy-worlds, this schism prompted the design of highly structured and formalized game worlds based on developer-created backstory, fixed narratives, and fixed goals: the Dorothy-worlds (Bartle, 2009). As the title of Bartle's article indicates, he focuses on the Alice and Dorothy worlds, whereas my interest in this study concerns the current day Wendy-worlds, such as SL. In table 2.3. next page, I have summarized some of Bartle's points combined with my own SL observations.

Three approaches to virtual world design			
World type	**Alice** - Wonderland	**Dorothy** - Oz	**Wendy** - Neverland
Current example	Ultima Online (1997-)	World of Warcraft (2004-)	Second Life (2003-)
Story	Backstory created by developers, stories by players Emerging narrative	Both backstory and stories created by developers Fixed narrative	No backstory, stories created by users Multiple narratives
Objective	Goals, but free interactions The journey is the goal 🡻 undetermined path	Fixed goals, fixed interactions The destination is the goal 🡻 predetermined path	Free goals, free interactions The interaction is the goal 🡻 no path
Identity	Undetermined, but role-based - role exploration	Predetermined and role-based - role confirmation	Undetermined, no predefined roles - identity exploration or confirmation
Structure	The world is structured, the game is not	Both the world and the game are structured	Both the world and the interactions are unstructured
Content	Developer- and player-created content	Developer-created content	User-created content
Appeal	Oldbies	Newbies	Oldbies

Table 2.3. Three approaches to virtual world design.

Comparing the game worlds, Alice and Dorothy, to the social Wendy-world like this, the differences are striking. In terms of whom "play together" (cf. Bartle's title), this has to do with appeal, and this should be seen in the light of immediate attraction, does the world attract and more importantly retain newbies? As stated by Bartle, Alice-worlds

attract oldbies (Bartle, 2009, p. 112), whereas Dorothy-worlds attract newbies (Bartle, 2009, p. 113).

Evidently though, a Dorothy-world like WoW (with millions of active players) also appeals to oldbies, the kind of players who find joy and interest in levelling up, the kind Bartle calls "achievers" (as we shall see further below). According to Bartle, this means that Alice and Dorothy could play together given their players could find interest in both types of worlds. Table 2.3. might also indicate why SL has problems when it comes to attracting and retaining users. Judging from the table, SL's motto "Your World, Your Imagination" becomes a double-edged sword. The lack of a backstory and predetermined goals leaves the SL user completely on her own to come up with a reason to play/stay. This problem, however, is not unique to SL or virtual worlds, but points to a classic design dilemma between the different needs of newbies and oldbies in all sorts of human-computer-interaction and systems design.

Interestingly though, I find that the general user-typology across the worlds does not differ as much, as one could expect. In "Designing Virtual Worlds" Bartle (2004, pp. 130-133) explains how he, in the early 1990's, based on a long-lasting debate between senior players of MUD2 regarding the motives for playing, analysed the ideas of what constituted fun seeing as this is the main motivation to play games. Bartle found that players could be categorized in four major types, and in table 2.4. below, I have compared Bartle's player typology to my observations from SL.

Typology of virtual world users	
Typology of players in games	**Typology of residents in SL**
Achievers, who are interested in doing things to the game - acting on the world	*Designers*, who are interested in doing things to the world - acting on the world
Explorers, who are interested in having the game surprise then - interacting with the world	*Explorers*, who are interested in having the world surprise then - interacting with the world
Socializers, who are interested in doing things with others - interacting with other players	*Socializers*, who are interested in doing things with others - interacting with other residents
Killers, who are interested in doing things to others - acting on other players	*Griefers*, who are interested in doing things to others - acting on other residents

Table 2.4. Typology of virtual world users.

Bartle's typology of players is based on two dimensions: how they prefer acting on things as opposed to interacting with, and how they prefer to direct their attentions toward other players. When trying to apply Bartle's typology to SL, I find three issues that do not match:

1. The overall term "players" indicates that there is a game to be played
2. The category "killers" implies a combat game-type world
3. The category "achievers" is also closely tied to the existence of a game – Bartle explainss their motivation: "These people put the game-like aspect of the virtual world to the fore. They like doing things that achieve defined goals, thereby progressing their character through the world's built-in ranking system." (Bartle, 2004, p. 130)

In terms of overall characterization of the users in SL, Linden Labs and many oldbies (myself incl.) refer to these as residents. The term is, nevertheless, not without problems. My observations and research data clearly show that many (especially newbies, but not only) feel homeless, alienated, and marginalized from the general SL community.

Other than this, it is interesting to observe that similar user-types can be identified across different worlds, although they most likely differ in terms of numbers in the different categories. I clearly recognize the socializers and the explorers. On the other hand, I have replaced the "killers" with griefers, which is a term borrowed from the game worlds. It is, however, also how we define troublemakers in SL, and the term is used in academic writings on SL as well (e.g. Boellstorff, 2008). I did consider the Internet term "troll", but since trolls seem to be deliberately malicious, and my experience with (some) griefers is that they often have more humorous intentions (albeit still annoying to those they act upon), I discarded it.

The designer category refers to the SL users, who design things inworld (buildings, art, clothes, animations etc.). I did consider the term "producers", but in my opinion, the socializers also produce and contribute to the content of SL. Compared to Bartle's "achievers", there are some interesting similarities. Designers also aim at mastering and acting upon the world, and even though there is no levelling system in SL, the mastery of the world and the ability to design things, also results in high scores in terms of social capital (Huvila et al, 2010). Given my particular focus on education, I find that teachers (and to some extent students) who engage in SL could be categorized as designers, because they design for learning. In general, it is my experience though, that SL users tend to oscillate between the different categories over time depending on current interests and mastery of the world.

Regardless of similarities across worlds, the motivation to enter and stay engaged in the world differs remarkably. As we saw above, the different worlds have various ontologies that attract different types of users. Besides the fundamental ontology, there

are more specific affordances of the virtual environment that influence the user-experience, and as a final way of investigating the concept of virtual worlds, a closer look at these environments as part of a multi-user virtual environment (MUVE) ecology is presented in the following sub-section.

2.1.4. 3D VIRTUAL WORLDS AS PART OF A MUVE ECOLOGY

As I mentioned in the previous chapter, my initial interest in SL was due to the sense of presence I experienced already in my first encounter with this particular type of virtual environment. In the beginning of his book "Being There Together – Social interaction in Virtual Environments", another pioneer in the field, Professor Ralph Schroeder, provides a definition of MUVEs:

> The VEs [virtual environments] discussed here relate to virtual reality (VR) technologies. In a previous book, I defined virtual reality technology as "a computer-generated display that allows or compels the user (or users) to have a feeling of being present in an environment other than the one that they are actually in and to interact with that environment" (Schroeder 1996: 25; see also Ellis 1995) – in short, "being there". (Schroeder, 2010, p. 4 – original emphasis)

And from this follows that MUVEs can be defined:

> (…) as those [virtual environments] in which users experience other participants as being present in the same environment and interacting with them – or as "being there together." (Schroeder, 2010, p. 4)

This sense of other users is what Schroeder labels co-presence (Schroeder, 2010, 26). In line with Schroeder's definition, the term MUVE is oftentimes used exclusively to characterize virtual environments designed on a 3D spatial metaphor (i.e. Dieterle & Clarke, 2008; Ketelhut et al., 2010), because this is seen as a precondition for experiencing presence, when there is an emphasis on the "there" component in the understanding of presence. However, the concept of presence has been debated in various research fields for more than 30 years, and Shifter, Ketelhut & Nelson (2012) provide an instructive overview of considerations for understanding presence in virtual environments based on renowned researchers' definitions, as shown in table 2.5. next page.

Considerations for understanding presence in a virtual environment	
Author, date	**Conditions/Considerations**
Heeter, 1992	Three dimensions of presence • personal, as you feel like you are in a VE • social, or the extent to which beings exist and react to you in the VE • environmental, as the VE reacts to you
Steuer, 1993; 1995	Two determinants of telepresence • vividness, or the sensorially rich mediated environment, stimulus driven, and depth of sensory information, dimensionality (1, 2, or 3D) • interactive, or the degree to which the user can influence form and content, number of people interacting in real time
Lombard & Ditton, 1997	Three causes of presence • form variables, incl. interactivity, use of voice, medium and shapes • content variables, incl. social realism, media conventions, and nature of task • user variables, incl. past experiences with the medium, age, gender and personality
Witmer & Singer, 1998	Three conditions for presence • level of involvement, depends on the degree of significance given to various stimuli • ability of user to focus on the virtual world • degree of immersion, or psychological state of being included in and interacting with the VE
Delgarno & Lee, 2010	Being there together in a MUVE with others around the world, e.g. Second Life

Table 2.5. Considerations for understanding presence.
(Shifter, Ketelhut & Nelson, 2012, p. 54)

By highlighting dimensions, determinants, causes, and conditions for presence, I find that Shifter, Ketelhut & Nelson succeed in illustrating the complexity of the

phenomenon. Furthermore, Shifter, Ketelhut & Nelson (2012, p. 53) point to the fact that presence definitions over the years have ranged from different conceptions of "a sense of being in an environment/a place" to "a perceptual illusion of non-mediation", depending on the researchers' particular focus. On another important note as well, Shifter, Ketelhut & Nelson state that technology and populations used to research and define presence have varied in the different studies, and that "being in a VR is very different today from what it was in the early 1990s" (Shifter, Ketelhut & Nelseon, 2012, p. 54). While I concur, I do find that elements from the early presence-researchers' conceptions still hold value, and as we shall see of particular importance to my study, is Lombard & Ditton's (1997) focus on form, content, and user variables.

As evidenced, presence can be conceptualized from many different perspectives, and in the field of distance education, the concept of presence has also been debated for decades. Notably the work of a Canadian research project referred to as "Community of Inquiry" (COI) that ran from 1997-2001[10], managed to bring focus to the concepts of cognitive, social, and teaching presence as being essential to especially distance educational experiences. The COI-project started with a focus on presence in 2D text-based, computer-mediated communication (i.e. Garrison, Anderson & Archer, 2000; Rourke, Anderson, Garrison & Archer, 2001), but has since moved on to study these particular types of presence in 3D virtual environments, such as SL, as well (i.e. Pellas & Kazanidis, 2014; McKerlich & Anderson, 2007).

Although I have chosen to disregard the COI framework for my analyses in this study, I did have the opportunity to meet and collaborate with three COI-researchers during my PhD-period. In the spring of 2009, Ross McKerlich, Terry Anderson and Brad Eastman (all affiliated with the Athabasca University at the time), invited me to participate in a research study on the usefulness of the COI-model as evaluation tool in 3D virtual worlds (Riis, 2009, June 24th), which resulted in an article (McKerlich, Riis, Anderson & Eastman, 2011). As mentioned, the COI-model was developed to analyse different types of presence in MUVEs. In our study, we concluded that from a student's perspective, learning in a 3D virtual world is often perceived as a rich educational experience that includes elements of all three types presence (McKerlich et. al, 2011).

Based on my collaboration with McKerlich, Anderson and Eastman, I included COI-research in the students' curricular readings. Moreover, the study meant that we met several times inworld. In the MIL09 cycle, I invited McKerlich and Anderson to give a lecture on the COI-model, and subsequently they participated in a vivid discussion with the students on presence perceptions, the avatar phenomenon, and design for teaching

[10] This Canadian Social Sciences and Humanities research funded project was entitled "A Study of the Characteristics and Qualities of Text-Based Computer Conferencing for Educational Purposes". Central to the study was the development of theory, methodology and instruments. Further information can be found on the project's website: http://communitiesofinquiry.com/welcome

and learning in virtual worlds, which I wrote about in 2011, when our article was published (Riis, 2011, September 16th).

Figure 2.3. Terry Anderson presents the COI-model in the MIL09 cycle.

As part of the inworld discussions in this MIL09 session, we used an interactive tool, called The Opinionater, which allows the SL users to walk on it, while it registers the results based on a Likert-scale. Typically, the Opnionater is used in conjunction with opinionated statements such as "The avatar enhances the engagement and thus learning outcome!" as depicted in figure 2.4. below.

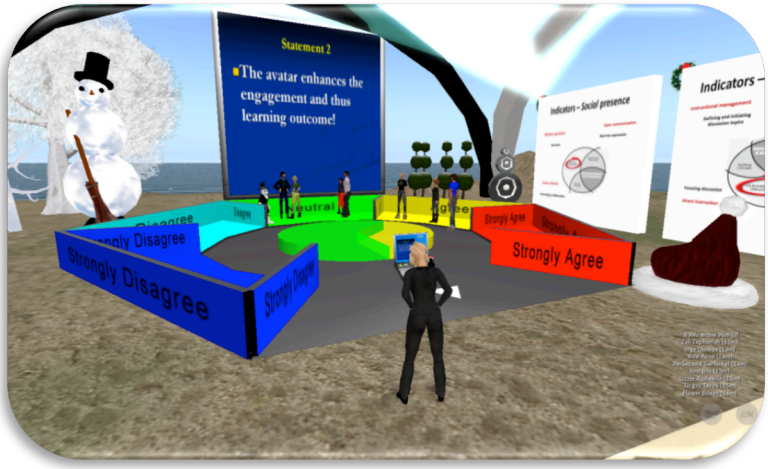

Figure 2.4. The MIL09 students engaged in The Opinionator.

Even though presence - in many different conceptions - in recent times mainly has been documented and tied to 3D virtual environments, my choice is to include and discuss both 2D and 3D virtual environments as examples of MUVEs. It is important to notice that the primary focus of my study is on SL. Nonetheless, other types of MUVEs cannot be ignored simply because both the research literature and the participants in my study often refer to these other types in an attempt to make sense of SL (cf. the human tendency to contrast phenomena in order to make sense of the world).

In February 2011, I met Professor Schroeder inworld where he gave a talk and joined a discussion with SL researchers on the topic of presence in 3D virtual worlds (Riis, 2011, February 7th). Many of the attending researchers were involved in education, and Schroeder's talk also triggered a discussion of different MUVEs and their applicability in education. In my study, a combination of SL and the learning management system FirstClass (FC) has been used in all four research cycles, but as we shall see, to varying degrees. My main argument for insisting on using FC has to do with some of the features it offers, especially the possibility of communicating asynchronously and in a threaded format. This indicates a serious limitation concerning SL when it comes to education and other types of professional use[11]. I will describe how FC was designed and used in each cycle, but my primary focus will be on SL.

Based on several inworld discussions on the differences between MUVEs for learning over the years, and by reading Schroeder (2010; 2007), I was inspired to create the MUVE overview presented in table 2.6. next page (Riis, 2012, June 7th). In this overview, the features of five different MUVEs are listed in terms of purpose, environment metaphor, user representation, communication modalities, dominant interaction frequency, and content creation. While there are similarities, and all of these MUVEs certainly can be used for teaching and learning purposes (even though only the LMS was intended as such pr. design), there is also a notable difference in terms of how the MUVE promotes embodiment or not.

[11] In an attempt to remedy this, the so-called SLoodle project was created to establish a MUVE that combined the best of SL and the more traditional Moodle platform (Livingstone, Kemp & Edgar, 2010). In 2009, I tried-out and reflected upon some of the features of SLoodle (Riis, 2009, March 3rd).

Type of MUVE	**3D VW** Three-dimensional virtual world	**MMORPG** Massively multiplayer online role-playing game	**Desktop VC** Desktop-based virtual conferencing system	**SNS** Social networking site	**LMS** Learning management system
Example	Second Life	World of Warcraft	Adobe Connect	Facebook	FirstClass
Features					
Purpose	Self-determined - multi purpose	Developer-determined - play the game	Developer-determined - meet	Developer-determined - network	Developer-determined - teach, study
Environment metaphor	Mirror or fantasy world non-fictional/ fictional	Fantasy world fictional	Meeting space, windows non-fictional	Network space, timeline non-fictional	Work space, desktop non-fictional
User representation	3D-avatar avatar name user/ resident embodied pseudonyms are default	3D-avatar avatar name player/ character embodied pseudonyms are default	Head/torso username user/ participant embodied pseudonyms allowed	2D-profile name, icon user disembodied pseudonyms not allowed	2D-profile name (icon) user disembodied pseudonyms not allowed
Communication modalities	Audition, vision, proprio-ception	Audition, vision, proprio-ception	Audition, vision	Vision (audition)	Vision
Dominant interaction frequency	Synchro-nous	Synchro-nous	Synchro-nous	Asynchro-nous	Asynchro-nous
Content creation	User-created	Developer-created	User-created	User-created	User-created

Table 2.6. Overview of Multi-User Virtual Environments (MUVEs) relevant to the study.

In another classical text, on collaborative virtual environments, Benford et al. (1995) define user embodiment as:

> (...) the provision of users with appropriate body images so as to present them to others (and also to themselves) in collaborative environments. (Benford et al., 1995, p. 242)

Benford et al. further explains the motivation for embodying users by considering the role our bodies play in everyday (non-computer supported) communication:

> Our bodies provide immediate and continuous information about our presence, activity, attention, availability, mood, status, location, identity, capabilities, and many other factors. (Benford et al., 1995, p. 242)

Given that our bodies are used to communicate both explicitly and implicitly, user embodiment becomes "an obviously important issue when designing collaborative virtual environments" (Benford et al, 1995, p. 242). However, according to the authors:

> (...) it appears that many collaborative systems still view users as people from the outside looking in. (Benford et al., 1995, p. 243 - my emphasis)

Two decades later, I would maintain that this is still the case in most MUVEs (cf. table 2.6.). On the other hand, MUVEs, such as SL, are trying to change this. As depicted in figure 2.1. earlier in this chapter, I was standing in my sandbox, designing a window through which I could interact with Facebook. The perspective and the potential sense of being embodied and present in SL, do, however, to a large degree, depend on how I use my so-called camera to adjust my point-of-view. This is a very important feature of SL, and as already stated, I will return to this on several occasions. For now, I just want to make a final point concerning perspective and its influence on the user-experience. Figure 2.5. next page shows the exact same situation, but whereas figure 2.1. is a so-called inworld snapshot, figur 2.5. is a screen-dump, and as such, it shows another reality of my experience.

Figure 2.5. Another perspective on interaction with Facebook from within SL.

Only if I am able to engage in and concentrate on the task (building and interacting with the Facebook window), use my abilities, as an avatar, to build and interact and ignore the real world environment (i.e. the SL viewer's borders, my computer-screen, and my physical location), will I be able to suspend disbelief and feel present, embodied, and potentially immersed in SL. In other words, I assert that 3D virtual worlds, such as SL, are not inherently immersive. 3D virtual worlds do, however, present opportunities for becoming immersed - and perhaps even more so than any of the other MUVEs discussed, game worlds aside. Nonetheless, to leverage potentials for teaching and learning is no simple task in any medium. For certain, SL offers plenty of opportunities for interaction in a 3D spatial environment making exciting concepts such as embodiment, presence, and immersion possible, but as my study will show, opportunities for interaction, do not equal meaningful learning trajectories. As witnessed in this section, a 3D virtual world is a complex phenomenon, and many considerations are necessary to transform this type of MUVE into a teaching and learning environment.

2.1.5. SUMMARY OF CONCEPTUAL BACKGROUND

In this section, I have presented key concepts pertinent to understanding the phenomenon of 3D virtual worlds. I have defined virtual as "a proxy for the material", making no qualitative distinction, but rather emphasizing the functional sameness. A brief account of the evolution of virtual worlds, has illustrated how game worlds and social worlds share history, technology, vocabulary, and oftentimes users. We have, however, also witnessed how game worlds and social worlds differ, even though the distinctions are blurred.

One important difference concerns the ontological level in terms of design and user-typology. In social worlds, such as SL, there is no predefined purpose for using the world; it is open-ended. Users are left to their own imagination to create meaningful interaction and to define themselves as avatars inworld. Both game worlds and social worlds are part of a lager MUVE ecology, but contrary to other types of MUVEs, they provide better potentials for experiencing immersion, embodiment, and presence - by large because of the 3D spatial environment and the use of a customizable avatar. Figure 2.6. below provides an overview of the MUVE ecology presented in this section.

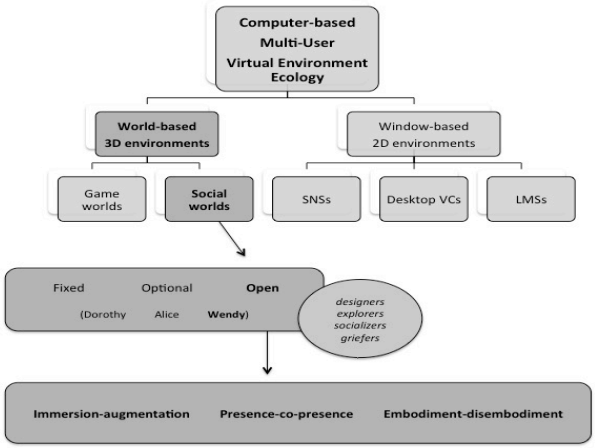

Figure 2.6 Overview of a computer-based MUVE ecology.

Depending on the underlying design metaphor, I have separated the MUVEs in to distinct types that are either world-based or window-based. In the latter, the user experiences the environment predominantly as looking through a window, not as an immersed participant in an (spatial) environment. As we shall see, this distinction is debatable insofar as some of the participants in my study never became immersed. Further, I would argue that it is possible to become immersed in 2D environments, as the experience of immersion does not rely on spatiality alone. As mentioned above, the 3D virtual worlds do nonetheless provide better opportunities for immersion, all in all.

In the overview, I have highlighted the elements of the ecology that are particularly relevant to my study. It should be noted that the user-typology I identified in relation to SL, concerns the general inworld user and does not necessarily translate to users who engage in the world with an educational purpose in mind. In other words, the typology is not intended as a learner typology although certain characteristics most likely could apply to both user-groups.

Finally, it should be noted that I have identified three pairs of key concepts that are important in terms of understanding the user-experience in virtual worlds. In relation to immersion, I have also chosen to bring forward the concept of "augmentation". Even though augmentation has not been mentioned in the literature used above, it is a concept that has had quite a lot of attention in SL and among the participants in my study. Originally proposed and debated as a concept contrary to immersion (Bennetsen, 2006), augmentation, in this context, denotes a way of explaining how some users experience a virtual world with no illusion of the world being real. In terms of users, Wadley (2008) differentiates between immersionists and augmentationist, claiming that the latter perceive and use virtual worlds just as any other type of communication tool. Wadley found that augmentationists typically would project their real-life identities into SL, making no attempt to stay anonymous.

On the contrary, immersionists would prefer to maintain a SL identity independent of their real-life identity, which they would not disclose (Wadley, 2008). As stated by Wadley, the immersion/augmentation categories may be seen as ideal types marking the ends of a spectrum. Given that quite a few of the participants in my study identified themselves as augmentationists, this is something I will return to. As the overview offers no indication of how to design for learning in virtual worlds, we now turn to a review of educational research.

2.2. 3D VIRTUAL WORLDS - EDUCATIONAL RESEARCH BACKGROUND

During my PhD-period, I have monitored research publication on an on-going basis, and in this section, I provide an overview of educational research that has inspired and informed my study. Given that I embarked on this PhD-journey back in 2007, I have come across and been inspired by a large body of research over the years. The research into 3D virtual worlds has evolved significantly through my research period, and it would be an impossible, and most likely irrelevant, task to contemplate reviewing all of the literature, I have collected. Instead, I have chosen to analyse recent reviews pertaining virtual worlds relevant to educational research. By doing so, I am able to highlight research trends, themes, topics, and findings, which will provide the reader with an educated overview of the field pertinent to understanding my research and its contribution to virtual worlds research. Further, it allows me to critically reflect on key concepts relevant to my study, other than those already discussed in the previous sections. Besides providing an indication of the status of the field (as of second quarter, 2016), I have used the reviews to identify relevant articles to support my final analysis in chapter eight.

2.2.1. REVIEWS ON VIRTUAL WORLDS RESEARCH

In this sub-section, I present an overview of recent (2010-2015) literature reviews concerning various aspects of virtual worlds research. The overview of the eight reviews is based on information about author(s), publication year, publication title, data collection period, review purpose and foci, and remarks.

Overview of reviews concerning virtual worlds research (2010-2015)

Author(s), publication year, *title*	**Data collection period**	**Number of publications reviewed**	**Review purpose and foci**	**Remarks**
Hew, K. F. & Cheung, W. S. (2010) *Use of three-dimensional (3D) immersive virtual worlds in K12 and higher education settings: A review of the research.*	2008 (1.Q) Reviewed articles span from 2008-2007	15	Purpose is to review past empirical research studies on the use of 3D VWs in education (K12 and HE). Foci on how these VWs are used, what types of research methods have been applied, research topics, and findings. Focuses on *social* virtual worlds (e.g. AW and SL).	Based on peer-reviewed empirical studies, descriptive research only. SL was used in five studies. Reviewed literature in appendix.
Dass, S.; Dabbagh, N. & Clark, K. (2011). *Using virtual worlds. What the research says.*	Not listed. Reviewed articles span from 2006-2009	15	Purpose is to review current research and draw implications for educational design. Findings are summarized through three lenses: inherent characteristics of VWs, pedagogical approach, and student perceptions. Focuses on SL.	Based on peer-reviewed case studies. SL was used in 13 studies. Reviewed articles summarized in table in the text.

Continues next page ...

Duncan, I.; Miller, A. & Jiang, S. (2012). *A taxonomy of virtual worlds in education.*	2008-2011 Reviewed resources span from 2002-2011	100	Purpose is to create a taxonomy of VWs educational usage that delineates theoretical and practical work based on different resources. The taxonomy is based on six categories: population, educational activities, learning theories, learning environment, supporting technologies, and research area. Focuses a variety of virtual environments (incl. VLEs, e.g. Blackboard)	Based on academic papers (not all are peer-reviewed), reports and educational websites. SL is mentioned as the dominant VW. Reviewed resources via link to external appendix.
Kim, S.H.; Lee, J. & Thomas, M.K. (2012). *Between purpose and method: A review of educational research on 3D virtual worlds.*	2011 (4.Q) *Reviewed literature not listed*	65	Purpose is to review past research to analyse application of VWs in education, use of software, use of research method, research fields, and research subjects. Includes both *game* worlds (e.g. WoW) and *social* worlds (e.g. SL).	Based on peer-reviewed studies, descriptive and experimental research. SL was used in 23 studies.
Wang, F. & Burton, J.K. (2013). *Second Life in education: A review of publications from its launch to 2011.*	2011 (2.Q) Reviewed articles span from 2006-2011	107 (50)	Purpose is to explore how SL has been discussed, investigated and applied in education from its launch to 2011. Focuses on annual publication numbers and characteristics of empirical research.	Based on peer-reviewed articles. 50 empirical studies were analysed in depth. Reviewed literature in appendix.

Continues next page ...

Beck, D. & Perkins, R. A. (2014). *Review of educational research methods on desktop virtual world environments: Framing the past to provide future directions.*	Not listed. Reviewed articles span from 1996-2012	127	Purpose is to describe educational research methodologies used in investigation and evaluation of desktop virtual world environments. Focuses on a variety of virtual environments (VWs, MUVEs, MMORPGs, VR etc.) S*ocial* virtual worlds (SL, AW) were, however, mentioned as being dominant virtual environments.	Based on 114 peer-reviewed papers, 12 presentations, and one book chapter. SL was used in 47 studies. Reviewed literature in appendix.
Correia, A. et al (2014). *Meta-theoretic assumptions and bibliometric evidence assessment on 3-D virtual worlds as collaborative learning ecosystems.*	Not listed. Reviewed articles span from 1998-2012	35	Purpose is to identify gaps and opportunities for research in collaborative virtual environments (CVEs). While unclear, CVE seems to equal *social* VWs. Focus is not exclusively on education, but also includes business purposes.	Based on 35 publications from journals, proceeding, and technical reports. Reviewed literature summarized in table in the text.
Loke, S. (2015). *How do virtual world experiences bring about learning? A critical review of theories.*	2013 (2.Q) Reviewed articles span from 2008-2012	80	Purpose is to review theories used to underpin empirical work in VWs for education, and how applicable such theories may be to the learning mechanism of VWs. Includes both *social* worlds (SL, AW, RC) and *serious game* worlds (QA)	Based on peer-reviewed articles. Reviewed literature via link to external appendix.

Table 2.x. Overview of reviews concerning virtual worlds research (2010-2015).

While I have read all reviews, only three of the reviews (Dass, Dabbagh & Clark, 2011; Wang & Burton, 2013 and Loke, 2015) have been selected for further inquiry and will be presented in detail in sub-section 2.2.2. The five remaining reviews have been *excluded* for the following reasons:

The Hew & Cheung (2010) review. This review is based on a small number of publications (n=15). The data collection was concluded in 2008, when virtual worlds research still was in its infancy, and Active Worlds (AW) was the domineering choice (9 studies). While interesting in a historic perspective, I have deemed it irrelevant to this part of my study, mainly because the identified five SL studies are descriptive.

The Duncan, Miller & Jiang (2012) review. This review is based on a large number of publications (n=100), but it is not restricted to peer-reviewed or even academic publications insofar it includes reports and educational websites (e.g. SL's homepage). Further, while SL is mentioned as preferred virtual environment, others are included, which I consider a limitation given the findings are not necessarily transferable to the type of 3D virtual world that my study concerns.

The Kim, Lee & Thomas (2012) review. This review is based on a large number of publications (n=65). It is based on peer-reviewed articles, but seems to include a variety of virtual environments given the authors have used the generic search term "virtual worlds". Importantly, the method used for the review is somewhat unclear and no distinct reference of the reviewed articles is given, making it impossible to retrieve and validate findings.

The Beck & Perkins (2014) review. This review is based on a large number of publications (n=127). It is based on peer-reviewed articles, but also focuses on a variety of virtual environments (VWs, VR, MUVEs, MMORPGs etc.). For the purpose of my review, the search terms were again seen as a limitation.

The Correia et al. (2014) review. This review is based on 35 publications incl. conference proceedings and technical reports. The review focuses on collaborative virtual environments (CVEs), which constitutes a specific view and could include a variety of different environments. According to the reference list, VR is also included, but no distinct reference of the reviewed articles is given. Further, this review does not concern education exclusively, and it was solely based on Google Scholar search, which I consider a methodological limitation.

Although, I have excluded these reviews from further inquiry in my study, their reference lists are still interesting, and in relation to other research foci (e.g. including other types of MUVEs), they could be relevant as well.

2.2.2. REVIEWS RELEVANT TO SL RESEARCH

In this sub-section, I present a critical analysis of three reviews that are particularly relevant to SL research and my study. The three reviews are:

1. The Wang & Burton (2013) review entitled "Second Life in education: a review of publications from its launch to 2011".
2. The Dass, Dabbagh & Clark (2011) review entitled "Using virtual worlds. What the research says."
3. The Loke (2015) review entitled "How do virtual world experiences bring about learning? A critical review of theories."

1) The Wang & Burton (2013) review

The purpose of this review was to explore how SL has been discussed, investigated and applied in education from its launch to 2011. The review focuses on annual publication numbers and characteristics of empirical research. The authors start with an introduction to the general evolution and use of MUVEs for learning:

> Riding on the back of the continued advances in computing and networking technology, the simple text-based MUVEs have evolved into persistent, real-world similar, three-dimensional (3D) virtual worlds where multiple users can participate simultaneously to interact with each other and the environment through their graphical representations know as avatars. (Wang & Burton, 2013, p. 358)

According to Wang & Burton, over the past two decades MUVEs have been increasingly used in education, and SL is currently the most mature and popular environment. While SL shares features with other MUVEs, the main reason as to why it has become so widely used is because SL is unique as being an open-ended virtual world that provides tools for inworld creation of both the avatar and the environment. As the authors state: "SL is created entirely by its users", which implies ownership and engagement. Further advantages of using SL in education are mentioned (Wang & Burton, 2013, p. 358-359):

- SL provides users with innovative ways to construct, communicate, and collaborate. People who are separated by distance can engage in social activity, making SL a good environment for international collaboration as well.
- The use of avatars can decrease the feeling of disconnection, which makes SL a potential medium for distance education.
- SL has the potential to support study that might be otherwise expensive or impossible in real life.

After a presentation of their review method, the authors proceed to their findings, which for the first part of their study, is based on 107 publications. Here Wang & Burton focus on trends in publication. Even though SL was launched in 2003, they did not identify any publications prior to 2006, which they explain may be due to the fact that educators did not start to explore SL until 2005. According to the authors, this was on the whole consistent with findings in other studies (Foster, 2007 & Luo & Kemp, 2008 - as cited in Wang & Burton, 2013).

The number of publications peaked in 2009 (n=48) after which it started to decline. They identified 21 publications in 2010, and only three in 2011. The authors do, however, note that 2011 was not representative, since their data collection period ended in the second quarter of that year. Among the 107 publications, 50 were empirical studies, 54 were conceptual discussions, and three were review and content analysis studies. In general, the amount of empirical studies increased from 2006 to 2011 (Wang & Burton, 2013, p. 361), indicating a more mature level of research.

In the second part of their study, Wang & Burton (2013) analysed the 50 empirical studies in depth. Almost all studies were conducted on the college level, and participants of the studies were mostly college students. Only two studies had other SL users as their participants - one study focused on senior citizens.

In relation to subject areas, this study found that teacher education, language education, and business studies, were the most common. Other subject areas were hospitality and tourism, computer studies, interactive learning environments, and general skills. This finding indicated a shift in subject areas compared to another study by Livingstone & Kemp (2007).

Merely half of the studies (n=24) discussed pedagogical approaches, and constructivist learning and experiential learning (very broadly defined) were the most common learning theories explored in combination with SL (Wang & Burton, 2013).

Wang & Burton also investigated the evolution of research foci based on five categories that emerged from their analysis (Wang & Buron, 2013, p. 362-363):

1. Explore (in focus from 2007-2011). These studies aimed to explore different potentials of SL to support learning, whether SL was appropriate for delivering courses, whether SL could support specific types of learning environments, and/or explore different instructional strategies.
2. Attitudes, perceptions and adoption (in focus from 2008-2009). These studies focused on students or instructors' attitudes, perceptions, and adoption of SL as learning environment.
3. Evaluate (in focus in 2009). These studies focused on evaluating effectiveness of different SL properties.

4. Exemplify (in focus from 2009-2010). These studies focused on providing examples of SL used in teaching.
5. Affect (in focus from 2010-2011). These studies focused on identifying factors that could affect SL-based learning activities.

As seen above, studies, which explored different aspects of SL in relation to teaching and learning, have been and continue to be the most common.

In terms of research methods about 50% of the empirical studies employed multi-method approaches, usually as a combination between surveys, interviews, SL chat logs, screen captures, researchers' observation, participants' work and peer evaluation. Survey was the most popular data collection method (n=34 studies), and qualitative research designs dominated the studies (Wang & Burton, 2013, p. 363-364).

Finally, in discussing sample size, the authors chose to disregard the years 2007 and 2011 due to limited number of studies those years (n=1 and n=2)[12]. As for 2008, studies tended to have medium sample size (n=21-50), in 2009 studies were either medium or very small (n=<10). In 2010, the sample sizes were more evenly spread with 33, 3% of the studies having very big samples (n=>100). Wang & Burton conclude that no specific trend regarding sample size was detectable in these 50 empirical studies (Wang & Burton, 2013, p. 364).

In summarizing their findings, the authors point to seven characteristics of SL research (Wang & Burton, 2013, p. 365):

1. The implementation of SL in education is no longer in its infancy
2. Empirical studies have mainly focused on the college level with limited attention to k-12 and adult education
3. The investigated subject areas leave plenty room for study of other particular areas
4. Researches mainly explored SL for its potentials to promote constructivist and experiential learning
5. Research focus has shifted from investigating students and instructors' acceptance of SL to providing examples of instructional practice
6. Qualitative research methods have been domineering the field
7. Future studies on acceptance of SL as a learning environment are considered redundant by the authors

[12] The one study identified in 2006, was not an empirical one (cf. Wang & Burton, 2013, p. 360).

My takeaway from the Wang & Burton (2013) review

I find that Wang & Burton's review provides an insightful overview of educational research in SL, and I recognize and agree on several of their points. I am not surprised that exploratory approaches to researching SL continue to be dominant, given that this medium constitutes a very different MUVE compared to others, as we saw in table 2.6. above. I am, however, somewhat surprised to learn that only approx. half of the identified studies discussed pedagogical frameworks. Whether, this means that the researchers' did not use some sort of theoretical foundation in practice, is difficult to ascertain from the review.

The prevalence of constructivist learning and experiential learning studies makes sense in this type of MUVE, where the user has vast possibilities to virtually construct inworld objects, experiment and manipulate the environment and herself, and do so either alone or in collaboration with peers and facilitators.

Finally, an interesting finding in the review has to do with subject area and target groups. As we saw, Wang & Burton (2013) found that Teacher Education was the most investigated subject field (n=7), whereas they identified a gap in terms of adults as target group. The authors have not classified the identified studies in relation to their investigation characteristics (level, subject area, pedagogical framework etc.), nor have they referred to studies directly, making it difficult to study their findings, and figure out exactly how they define adult education. In any case, even though, the majority of participants in my study are employed in the educational sector, I would characterize the MIL Programme as Further Education or Continued Professional Development, which means that my study contributes to filling an apparent gap on adults' perceptions and use of SL.

2) The Dass, Dabbagh & Clark (2011) review

The purpose of this review was to analyse current research on virtual worlds and draw implications for educational design. 13 of the 15 identified case studies used SL. In their review, the authors concentrate on characteristics of virtual worlds, applied pedagogical approaches, and student acceptance of the virtual environment in Higher Education. In their introduction, Dass, Dabbagh & Clark focus on virtual worlds from an educational perspective listing some of the characteristics of this type of learning environment, such as provision of classroom space, but:

> (...) unlike learning or content management systems, it is the sense of presence, togetherness, and the "thereness" in addition to a sense of community, that is often cited as the draw to virtual worlds. (Dass, Dabbagh & Clark, 2011, p. 95)

Additionally, the authors highlight the students' possibilities to experiment in a safe environment with no material costs and extensive user-control. Citing de Freitas' (2008)

typology of virtual worlds (cf. section 2.1.2. above), Dass, Dabbagh & Clark choose to use the social world distinction, when discussing the two virtual worlds identified (SL and AW). According to the authors, one of the most important features of a social world is "the use of an avatar to engage the user or participant" (Dass, Dabbagh & Clark, 2011, p. 96), which also influences the inherent characteristics.

Through the use of the avatar there is a sense of presence, and:

> Presence is explained by the sense of space and ability of the avatar to interact with the environment. (Dass, Dabbagh & Clark, 2011, p. 96)

Further, through the avatar awareness of others and on-going activities are established, there is a means to communicate through text and audio, and an ability to collaborate through the use of programmed tools inworld. Other notable characteristics are how virtual worlds, through a temporal and spatial sharing of the environment with others, induce a sense of belonging to a community and how the avatar provide the user with a sense of self. While claiming that these inherent characteristics can be utilized for learning, Dass, Dabbagh & Clark caution:

> However, technologies do not cause learning, but rather afford opportunities that may lead to learning. (Dass, Dabbagh & Clark, 2011, p. 96)

With regard to the potential immersive aspect of virtual worlds, the authors further warn against simplification and ill-reflected technology use:

> However, simply placing the learner in a virtual world does not necessarily constitute being immersed or engaged. How much influence the learner has on the situation or how real the experience is will determine the degree of immersion or engagement. (Dass, Dabbagh & Clark, 2011, p. 97)

After a presentation of their review method, the authors proceed to their findings pertaining pedagogical approaches used in social virtual worlds research based on their analysis of the 15 studies. Dass, Dabbagh & Clark found that a variety of pedagogical approaches were used: collaborative learning, experiential learning, action learning, active learning, problem-based learning, constructionism, and social constructivism (Dass, Dabbagh & Clark, 2011, p. 98).

In the context of my study, it serves no purpose to reiterate the authors' findings on all the different theories, and I have therefore chosen to focus on problem-based learning and social constructivism.

According to Dass, Dabbagh & Clark (2011):

> Problem-based learning is a pedagogical model that engages students in solving ill-structured problems using hypothetico-deductive reasoning and assumes no formal prior knowledge of the learning domain. (Dass, Dabbagh & Clark, 2011, p. 101)

The authors identified one study, which used problem-based learning and found that:

> The combination of problem-based learning with Second Life provided a number of distinct advantages, offering an ideal venue in which to exercise authentic problem-based learning, reinforcing the facilitative role of the instructors, whilst offering motivation and relevance for the students. (Good et al., 2008, p. 172 - as cited in Dass, Dabbagh & Clark, 2011, p. 102)

Turning to social constructivism, the authors state that:

> In social constructivism, knowledge is socially constructed; learning is social in nature as in a community of practice; and the learner progresses from novice to expert under the guidance of expert community of practice members. (Dass, Dabbagh & Clark, 2011, p. 103)

Dass, Dabbagh & Clark identified three studies based on social constructivism, one of which used Second Life in an English as second language course:

> The research revealed that in future courses, once the students become adept with Second Life usage, the students could interact in a more naturalistic manner of improvised interactions. (Wang et al., 2009 - as cited in Dass, Dabbagh & Clark, 2011, p. 103)

The authors then proceed to their findings on student receptivity, perception, and learning. Dass, Dabbagh & Clark define receptivity as "the user acceptance of a new technology" (2011, p. 104), and they found two studies that investigated students' receptivity of Second Life:

> These studies indicate that student receptivity of Second Life as learning environment relies on student perceived usefulness of the technology and the value they place on collaboration and communication. (Dass, Dabbagh & Clark, 2011, p. 104)

In terms of student perceptions, findings on this aspect were, according to the authors, "obtained mostly through course evaluations on the use of the virtual world" (Dass, Dabbagh & Clark, 2011, p. 105). Dass, Dabbagh & Clark found that student perceptions, in general, were affected by two dominant factors: 1) ease of use, and 2)

relevance and authenticity of the inworld learning activities. In one study conducted in SL, the researchers found that even though the students enjoyed SL, found it useful as a learning environment, and had the knowledge to use it, "only 58, 3 % felt it was easy to use, and hence only 45, 8% would use Second Life on a regular basis" (Wang & Braman (2009) - as cited in Dass, Dabbagh & Clark, 2011, p. 105).

In relation to relevance and authenticity, Dass, Dabbagh & Clark (2011, p. 105) note that several researchers emphasize the importance of aligning appropriate activities with the desired learning outcomes. Further, the authors theorize that the amount of time students spend on orientation may affect student perceptions and conclude that:

> Orientation covering virtual world functionality and skill sets required for course completion is really mandatory. (Dass, Dabbagh & Clark, 2011, p. 105)

In one of the reviewed studies, conducted in SL, Schiller (2009) found that the ease of using the avatar was rated lowest among surveyed items. In their review, Dass, Dabbagh & Clark (2011), identified limited research on student learning as related to the use of virtual worlds, which they speculate has to do with the fact that:

> (...) student learning is generally not measured by standardized, knowledge-based tests in constructionist and constructivist learning environments. (Dass, Dabbagh & Clark, 2011, p. 106)

Based on their findings from the reviewed studies, the authors identify three implications for design, if a virtual world initially is assessed an appropriate technology for the educational goals:

1. Use the world's built-in tools
2. Use the 3D space
3. Use an exploratory and experiential approach to learning processes

In their conclusion of the review, Dass, Dabbagh & Clark state that using virtual worlds as a learning environment, in general, is a positive experience, but educators should take into consideration the above mentioned aspects and recommendations for future design (2011, pp. 108-109). As a final point, the authors maintain:

> Although virtual worlds can accommodate current learning theories and pedagogical models, these theories and models may need modification to account for the richer affordances of a virtual world; where learning is not an event but an experience. There is much room for research in this still young and developing technology. (Dass, Dabbagh & Clark, 2011, p. 109)

My takeaway from the Dass, Dabbagh & Clark (2011) review

As with the previous review, I agree upon and recognize many issues in the Dass, Dabbagh & Clark (2011) review, as well. I welcome the authors' emphasis on the avatar as decisive part of the 3D virtual world. The avatar's importance in relation to the user's inworld engagement and possibility of experiencing presence and immersion, as stated by the authors, is in concurrence with the findings in my study.

As witnessed, problem-based learning has been identified as an appropriate approach with regards to designing for learning in 3D virtual worlds. Even though my study is located in a problem-based learning context, this is not something I emphasize in my study, as I have chosen to put other theoretical frameworks to the fore. Nonetheless, in the final research cycle (MIL10), I did return to some of the fundamental principles in problem-based learning, and as such, it is interesting to observe and study how other researchers have dealt with this approach in 3D virtual worlds.

In terms of pedagogical approaches, it is also interesting to observe how different researchers classify and interpret different theories. As we saw, Dass, Dabbagh & Clark (2011) refer to situated learning and communities of practice as being part of an overarching social constructivist approach. This is in agreement with Ito et al. (2009), who consider all of the mentioned theories as part of the "social turn" emerging in the 1980's. There are, however, subtle, but important differences between these theories, which I will return to in chapter four.

Dass, Dabbagh & Clark's (2011) findings on student receptivity, perceptions, and learning also resonate with my findings, in particular their findings concerning ease/difficulty of use and relevance of activities. Furthermore, the authors' highlighting of the time needed to learn how to navigate and master the medium sufficiently is a crucial point. Without knowing exactly how the authors define students from Higher Education, this indicates common challenges across target groups (cf. my comment regarding adults above).

Finally, with regard to design implications, I find that Dass, Dabbagh & Clark (2011) have captured several of the most essential issues, and as we shall see, I struggled with some of the pitfalls they mention (e.g. not aligning the inworld activities appropriately with the curricular goals), especially in the two first research cycles in my study.

3) The Loke (2015) review

The purpose of this review was to identify and analyse theories that educational researchers have used to support empirical work in both social worlds (SL, AW, RC) and serious game worlds (QA). The author aims to determine how applicable such theories might be to the learning mechanisms of virtual worlds. In the introduction,

Loke problematizes the apparent lack of theoretical underpinnings in virtual worlds research, stating that:

> Many educators have speculated on the potential of virtual worlds, notable to mimic real-world settings and practices. (...) However, educators have not adequately theorised how students' virtual world experiences bring about the learning of real-world knowledge and skills (Loke, 2015, p. 112)

The author further argues that design of educational activities have been more intuitive than theory-based, and referring to the Wang & Burton (2013) review, Loke points to the fact that approx. half of Wang & Burton's identified empirical studies were pragmatic, rather that theoretically informed (Loke, 2015, p. 112). According to the author, learning theories explain which mechanisms or processes that brings about particular learning experiences, and thus states:

> If educators knew which learning mechanisms apply to a particular learning experience, they would better be able to determine what their students can learn from that experience. (Loke, 2015, p. 112)

After a presentation of the review method, the author presents his findings. Based on 80 peer-reviewed articles, in which 30% did not state explicit theoretical foundations, Loke identifies 11 different theories: experiential learning, situated learning, social constructivism, constructivism, presence theory, flow theory, community of inquiry (COI), transactional distance theory, projective identity model, self-efficacy theory, and finally transactional model of teaching (Loke, 2015, p. 114).

Prior to proceeding to a critical evaluation of the theories, Loke excludes four of the theories because they "neither apply to, nor illuminate, the virtual world learning experience" (Loke, 2015, p. 115). The excluded theories include flow theory, transactional model of teaching, transactional distance theory, and COI.[13]

Again, it is irrelevant to reiterate Loke's findings on all the different theories, and I have therefore chosen to focus on Loke's critical evaluation of the use of situated learning and presence theory only. Among the 80 articles, Loke identified 13 studies using situated learning as theoretical foundation (Loke, 2015, p. 114), and found that the majority of these cited the work of Lave & Wenger (Lave & Wenger, 1991; Wenger, 1998). According to the author, situated learning theory:

[13] Given that I have studied the use of COI in SL, Loke's arguments are quite interesting. While I disagree that COI does "not apply, nor illuminate the virtual world learning experience", I agree that it is not a learning theory, but neither are some of the others (i.e. presence theory and self-efficacy theory).

> (...) critiques the idea that human cognition resides in the individual's head, independent of context. The theory proposes instead that the ways in which human beings think and act are inherently coupled with their sociocultural context. (Loke, 2015, p. 116)

Loke states that when situated learning is applied in virtual worlds, it is implied that the world is realistic enough "to lead students to think and act as they would in real-world situations" (Loke, 2015, p. 116). In the evaluation of the applicability of situated learning, the author cites one of the 13 identified studies directly, namely a study on role-play in a virtual mine (Garrett, 2012 - as cited in Loke, 2015, p. 116). Based on this Loke finds it plausible that students role-playing in virtual worlds think as they would in real-world, but:

> (...) it is implausible that the students role-playing in virtual worlds would act as they would in real-world: deciding on one's movement speed in a virtual mine (by pressing a button) is not the same action as adjusting one's physical exertion in a real mine. It is implausible that learners undergo such a physical experience in virtual worlds. (Loke, 2015, p. 116 - my emphasis)

In summing up the section about the applicability of situated learning in virtual worlds, Loke writes:

> In this case, unless the correspondences between the virtual world experience and the physical experience is explained, situated learning is inadequate in explaining how the virtual world experience might bring about the learning of real-world knowledge and skills. (Loke, 2015, p. 116)

In terms of using presence theory as theoretical foundation, Loke identified eight studies, wherein the majority cited some of the classical texts (Blascovich, 2002; Heeter, 1992; Slater, 1999; Steuer, 1993; Winn, 1993 and Witmar & Singer, 1998 - as cited in Loke, 2015, p. 118). According to Loke, many definitions of presence exist, and he cites "the most commonly accepted one":

> Presence is defined as the subjective experience of being in one place or environment, even when one is physically situated in another. (Witmer & Singer, p. 225 - as cited in Loke, 2015, p. 118)

The author further states that in presence theory it is assumed that if a user experiences a high degree of presence in VR, this will be similar to experiences in the physical world, and this assumption exists in education as well:

> In virtual worlds for education, if a student experiences a high degree of presence, it is implied that she would experience a similar psychological state as when she is performing a real-world action. (Loke, 2015, p. 119)

Based on Schroeder (2010 - as cited in Loke, 2015), the author then presents a word of caution in relation to applying presence theory to computer-based virtual worlds, because researchers in the field of VR have rarely studied presence in these types of virtual environments. Instead CAVE-technologies where users' physical movements are monitored have been investigated in VR research. Further, Loke (2015) describes how VR-researchers are "divided on whether users can experience presence in desktop virtual worlds", and that this depends on their conception of presence.

Loke does not cite any of the eight identified studies directly, but chooses to exemplify a problem with regard to unrealistic inworld graphics and animations, which causes breaks in presence experiences, through a study he has co-authored (but not included in the reviewed articles):

> For example, in a virtual world hospital, some students did express that Second Life's built-in animations of avatars typing in mid-air (to signal text-chatting) made the patient-doctor interaction less believable (Loke et al., 2012 - as cited in Loke, 2015, p. 119)

Based on this, Loke contends "that students can at best evoke a sense of presence intermittently in desktop virtual worlds" (Loke, 2015, p. 119), and in summing up the section on applicability of presence theory, the author writes:

> (...) I speculate that students are unlikely to feel a sense of presence when undertaking virtual world actions in desktop virtual worlds. In turn, presence theory would indicate that a student's virtual world action is unlikely to correspond to her real-world physical action (Loke, 2015, p. 119).

In the conclusion of the review, Loke finds that the seven reviewed theories "adequately explains how four learning mechanisms are applicable to virtual worlds" (Loke, 2015, p. 119), namely that students learn through:

1. reflection
2. verbal interactions
3. mental operations, and
4. vicarious experiences

But then again, Loke concludes that one commonly implied learning mechanism is inapplicable to virtual worlds: "that students undergo a physical sensorimotor experience of the real-world phenomenon through their virtual world actions" (Loke, 2015, p. 119). Finally, Loke deduces that the physical experience is "still very much needed" (2015, p. 119), and that his findings point toward a need to develop an alternative theory in order to explain how virtual worlds might bring about students' learning of real-world knowledge and skills.

My takeaway from the Loke (2015) review

At first glance, Loke's (2015) findings are discouraging given that situated learning and presence theory are central to my study. It should, however, be noted that I disagree with Loke on most of his conclusions. Nonetheless, I have chosen to include this review to illustrate a) how virtual worlds research can be conceived, b) how virtual world researchers (like in any other field) disagree on the fundamentals, and finally c) because even though I disagree with Loke on many issues, I do believe that it is important to maintain a critical perspective on the (educational) potentials of virtual worlds.

Returning to my disagreement with Loke, a few theoretical remarks should be made. After reading the 13 studies that Loke refers to as being based on situated learning, I am wondering exactly how Loke understands this strand of theories. For example, in one of the reviewed studies (Diehl & Prins, 2008), the authors base their research on Activity Theory (citing Yrjö Engeström and colleagues and by using the well-known activity system), while there is no reference to any of the usual situated learning theorists (i.e. Lave and/or Wenger; Brown and/or Duguid). As we shall see, in chapter four, I refer to Activity Theory as being part of an overall socio-cultural paradigm, and while there are commonalties among the theories in this paradigm, I would not classify Activity Theory as situated.

Many researchers point to the authenticity of experiences as being pivotal to situated learning (i.e. Falconer, 2013; Cram et al., 2011; Tamai et al., 2011; de Freitas, 2010), but I find Loke's emphasis on this particular point, as the only way of validating the applicability of the theory in virtual worlds, way too simplistic. By reducing situated learning like this, I find that Loke misses out on other central aspects of the theory. As viewed in the Dass, Dabbagh & Clark (2013) review above, other researchers have found situated learning applicable to virtual worlds (e.g. Wang et al, 2009), and besides this, two large research projects in AW, are worth stressing. Harvard University's River City (RC) project conducted by Professor, Christopher Dede and colleagues and Indiana University's Quest Atlantis (QA) project conducted by Professor Sasha A. Barab and colleagues have shown that situated learning on many accounts is applicable to virtual worlds (i.e. Dieterle & Dede, 2007; Barab et al. 2007). As far as I can tell, research from both projects dealing specifically with situated learning has been published prior to Loke's data selection period (2008-2012), which in all probability explains why it has not been included in the review.

My main[14] argument for not focusing on the findings from the abovementioned AW-projects in my study has to do with the fact that both projects are based on "heavily customized virtual worlds, with teams of developers working to create the virtual worlds" (Livingstone, Kemp & Edgar, 2008, p.141). This calls into question, whether

[14] Additionally, both projects target school children, and AQ is considered a *game* world.

these AW-configurations could be classified as open-ended virtual worlds in the two projects. Further, as previously illustrated in table 2.6., different MUVEs have different affordances that can affect the teaching and learning processes and outcomes. As my data will show, the numerous possibilities for customizing and interacting with and through the avatar in SL greatly influence the students' learning experiences, and there are simply not the same possibilities in AW.

A final point concerning Loke's review of situated learning has to do with transfer of knowledge. As we saw, Loke cautiously distinguishes between thinking and acting concluding that the transfer potential of knowledge and skills acquired in virtual worlds is questionable. While transfer has not been a specific point of interest in my PhD-study[15], I tend to concur with Loke, but rather that seeing this as a disadvantage of virtual worlds, I consider it a more fundamental epistemological problem, one, which often is debated in regard to both the transfer concept and situated learning itself (cf. Akkerman & Bakker, 2011; Sfard, 1998).

Turning to Loke's review of the applicability of presence theory in virtual worlds, I have some reservations as well. I agree with Loke that researchers in general disagree on the immersive potentials of virtual worlds, but in this case, I find that Loke misinterprets some of the researchers he refers to. Including Bailenson, Blascovich & Schroeder as part of a group that "would classify virtual worlds as non-immersive" (Loke, 2015, p. 119) surprises me. As demonstrated in sub-sections 2.1.1. and 2.1.4., all of these researchers refer to the immersive potential of virtual worlds. Rather than characterising virtual worlds as being non-immersive, I would question the degree or level of immersion, and in this respect, it is true that Bailenson, Blascovich, and Schroeder differentiate between computer-based virtual worlds and more conventional VR-technologies such as CAVE-type environments, with the latter potentially providing a higher degree of immersion judged on graphical and behavioural naturalism. However, as we witnessed above, and in particular in table 2.5., based on Shifter, Ketelhut & Nelson (2012), which also is one of the studies Loke identified, many factors, other than graphical and behavioural naturalism, influence immersion and the sense of presence.

Having said this, I do think Loke makes a valid argument in pointing to the problem with breaks in presence that can (and often do) occur in virtual worlds - most commonly due to technical issues pertaining bandwidth and poor graphical rendering, which causes lag and thereby disrupts the user-experience. Evidently, technical insufficiency is a problem in any virtual environment.

Finally, there is the matter of Loke's speculation that students are unable to feel a sense of presence in 3D computer-based virtual worlds. I disagree entirely, but instead of

[15] As noted in my CV, I am currently (2015-2017) the leader of a research project concerning ICT and transfer in Vocational Education and Training at The Metropolitan University College, Denmark.

discussing why, I will let the data from my study tell a different story in the following chapters.

2.2.3. SUMMARY OF THE EDUCATIONAL RESEARCH BACKGROUND

In this section, I have presented findings from recent literature reviews concerning various aspects of educational virtual world research. Zooming in on reviews on SL, we have seen how this type of research peaked in 2009 and has been dominated by exploratory studies. Perhaps due to the exploratory nature, merely half of the identified empirical studies have been based on explicit pedagogical foundations. Among these, different learning theories have been applied, many focusing on constructivist and experiential ideas indicating how researchers perceive the potentials of SL. The reviewed literature also point towards a high degree of acceptance and appreciation of SL as a teaching and learning environment. Based on findings from the reviews, I have summarized the most important recommendations in terms of design for learning in SL in figure 2.7. below.

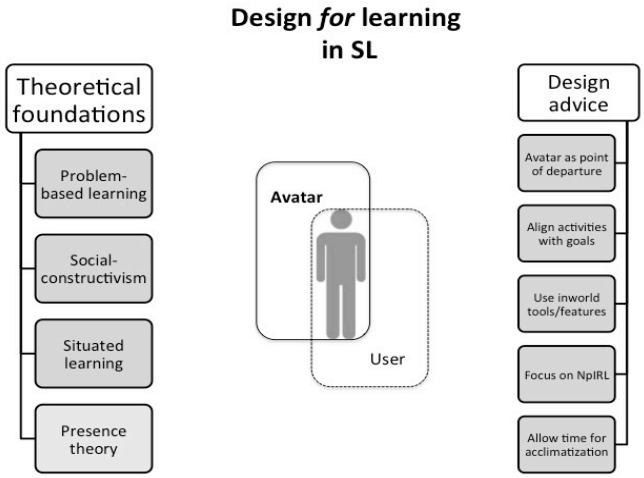

Figure 2.7. Recommendations for design for learning in SL.

Drawing on the reported experiences with designing for learning based on theories relevant for my study, it is possible to identify five central recommendations on which there seems to be consensus:

- **Avatar as point of departure** - given that it is through the avatar the world is experienced, this particular feature should be acknowledged and addressed as an important part of the pedagogical design.

- **Align activities with goals** - alignment between learning activities and learning goals is always a good way of ensuring meaningful experiences. Perhaps even more so in SL where there is no predefined purpose.
- **Use inworld tools/features** - while this advice may seem banal, findings from the reviewed studies indicate that this is not always the case, but also that it could contribute to meaningful inworld experiences. This would also include making use of the 3D space, and thus not using the world as a communication tool only.
- **Focus on NpIRL** - using the world to facilitate activities and interaction with objects that are Not possible In Real Life, is also highlighted in many studies. Role-play in a safe environment and the creation of 3D representations are frequently mentioned.
- **Allow for acclimatization** - the majority of reviewed studies point to the fact that it takes considerable time for students (and teachers) to learn how to use the avatar and the world.

It should also be noted that some of the challenges relating to the use of SL, has to do with the technology itself. Hence, while focus on the avatar phenomenon is vital, the role as user (of technology) should not be ignored, but also play an important part of the pedagogical design. As we shall see, I was not conscious of or followed these recommendations from the onset of my study, but rather learned them through my experiences in the research cycles. I will return to these recommendations in my analyses and in my proposed design framework.

CHAPTER 3.
DESIGN OF THE STUDY

In this chapter, I describe how my study is situated in a research paradigm and why I have chosen an Action Research (AR) approach, which also includes a comparison with other research approaches. I present AR in terms of its general characteristics such as: foundational principles, knowledge interests, the dual process of focusing on both research and problem solving, strategies of inquiry, and positionality. Further, I describe how I have generated a data archive consisting of data stemming from engagement in the study's research cycles, but also of data generated from engagement in my personal and professional learning network (PLN). This enables me to elaborate on the different methods, I have employed in the study, focusing on online activities.

In terms of data generation and analysis, I have been inspired by Grounded Theory (GT), which is briefly explained. I describe how I have conducted the data coding process, which concepts and categories I have identified and how. Finally, I reflect on research quality and research ethics.

3.1. SITUATING THE STUDY IN A RESEARCH PARADIGM

According to MacKenzie & Knipe (2006), in the social and applied science, the exact nature of how research is defined will depend on the researcher's personal and professional beliefs. Meyers (1997) argues that all research is based on some underlying philosophical assumptions about what constitutes warranted research and which research methods best guide such investigation. Philosophical assumptions or pre-understandings are often hidden or difficult to articulate, especially for new scholars (Birks & Mills, 2001). Nonetheless, it is important to discern such assumptions before embarking in any research endeavour, because:

> All research is interpretive: it is guided by a set of beliefs and feelings about the world and how it should be understood and studied. Some beliefs may be taken for granted, invisible, or only assumed, whereas others are highly problematic and controversial. (Denzin & Lincoln, 2011, p. 13)

Hence, in order to conduct and not least evaluate research it is important to clarify the underlying assumptions, often referred to as the research paradigm, for the reason that:

> It is the choice of paradigm that sets down the intent, motivation and expectation for the research. Without nominating a paradigm as the first step, there is no basis for subsequent choices regarding methodology, methods, literature or research design. (MacKenzie & Knipe, 2006, p. 2)

Without diminishing the point of MacKenzie & Knipe, their wording, i.e. choice of paradigm, may lead to misconceptions because the choice is not entirely free. As we have seen, the choice of paradigm would likely be influenced by the researcher's assumptions, and more importantly, the choice should ideally be directed by the research question(s) and the overall purpose of the study. To further complicate matters, as recognized by both MacKenzie & Knipe (2006) and Meyers (1997), the discourse surrounding paradigms is inconsistent, and the distinction between what constitutes different paradigms and whether or not they are compatible, is somewhat unclear in the literature. As a result, Meyers (1997) suggests a three-fold classification, whereas MacKenzie & Knipe (2006) suggest four paradigms:

1. Positivist/postpositivist
2. Interpretivist/constructivist
3. Transformative
4. Pragmatic

Given my educational background, which includes a BSc in Human Nutrition, I am no stranger to the positivists/postpositivist paradigm. Yet, not least through my Master's degree and subsequent work at the Master's programme on ICT and Leaning (MIL) have my ontological and epistemological assumptions evolved, and if I were to situate my research within the positivists/postpositivist paradigm, I would most likely struggle from a personal point of view due to my changed perspectives. The purpose of this study is fundamentally to understand a social phenomenon where interaction and knowledge creation is seen as a social construct, and not as a priori truth that is waiting to be discovered, measured, predicted or controlled by the researcher. As such, it quickly became obvious that a positivists/postpositivist approach would not be able to inform my study or answer my research questions.

Conversely, in the interpretivist/constructivist paradigm, the intention of the research is to understand the world by trying to make sense of the experiences and attributed meanings others have about the world. Researchers focus on the processes of interaction among individuals and on the specific contexts in which individuals live and work. Further, proponents of this paradigm recognize that the researchers' own background impact the research and their interpretation hereof. This paradigm seems appropriate for my research because I seek to understand a community's response to changes in its practice, and the manner in which students respond, participate, and construct meanings in this new practice. This construction of meaning is socially and historically negotiated among all the participants of the study, and change of beliefs and values, and creation of new meanings about teaching/learning practices is embedded in a socio-cultural context.

Similar to constructivists, researchers in the transformative paradigm, hold that reality is constructed within a historical and social context, but they are more focused on power relations and general social issues – often blending research with a political agenda. In

line with this, it should be noted that the transformative paradigm occasionally is referred to as the "critical" paradigm (Meyers, 1997). In the context of this study, I understand research as a way to improve practice, and the transformative paradigm with its focus on agency and change, provides a useful approach. Given that my study is aimed at transforming practice, if not to emancipate the students, then to empower them, I find that key aspects from the transformative paradigm can inform my research as well. Finally, researchers in the pragmatic paradigm are focused on solving real-life problems, and while my study was initiated by a research interest, real-life problems quickly occurred due to the implementation of a new technology, and my study consequently became problem oriented (cf. the combination of research interests and problem solving interests mentioned in chapter one).

In summary, I argue that my research primarily is situated within the interpretivist/ constructivist paradigm in terms of the overall science theoretical approach to my research phenomenon, but also that it has been inspired by ideas and principles from the transformative and pragmatic paradigms. Combined, these research characteristics guided the next step in the design of the research: the choice of an overall research approach/methodology.

3.1.1. CHOOSING AN ACTION RESEARCH APPROACH

In line with Mackenzie & Knipe (2006), I understand methodology as the overall approach to designing and conducting research, which is closely linked to the chosen paradigm. Methods, on the other hand are systematic modes, procedures, techniques, or tools used for collection, generation and analysis of data, and I will return to these in section 3.3.1. below.

Yin (2009) distinguishes between three stereotypical types of research approaches depending on overall purpose: exploratory, descriptive and explanatory. Conversely, Launsøe & Rieper (2005), tie research to four ideal-typical types of purposes that should guide the design of the research:

1. Research aimed at describing the object of study – a key question could be: "How is x related to y?"
2. Research aimed at explaining the object of study – a key question could be: "What x causes y?" or "What y is a consequence of x?"
3. Research aimed at understanding the object of study – a key question could be: "What sense does (subject) x make of (phenomenon) y, and in which (context) z?"
4. Research aimed at changing the object of study – a key question could be "How does (subject) develop (phenomenon) y during (action) z?" (Adapted after Launsøe & Riper (2005) – my translation)

While many research projects contain more than one research question, there normally is one overall purpose that denotes the research design. Launsøe & Riper (2005) further compare the four types with the dominant research perspective, as shown in table 3.1. below.

Overview of ideal-typical research types				
Type	**Descriptive**	**Explanatory**	**Understanding**	**Change oriented**
Typical design	Survey Sampling	Experimental	Case study	Action Research Formative Evaluation
Dominant perspective	Researcher	Researcher	Research subjects	Research subjects and researcher

Table 3.1. Overview of ideal-typical research types.
Based on Launsøe & Riper (2005, p. 36 – my translation)

For both Yin (2009) and Launsøe & Riper (2005), it is the research purpose and the research question(s) that must guide the overall approach, the design of the study. They all caution against a hierarchical and too rigid understanding of the research types seeing that a study easily could include a combination of questions/purposes. In my study, the overall purpose is to understand what happens to a particular pedagogical community when a new technology such as SL is implemented in its practice, and this has lead me to choose an overall Action Research (AR) approach, which has enabled me to monitor change over time, in four consecutive research cycles. As we shall see, AR is not one, uniform approach, but can be described as "a set of practices" that share some common fundamental ontological and epistemological beliefs (Reason & Bradbury, 2009). AR also leaves it to the researcher to decide how to conduct the research on a more pragmatic level – there are no predefined ways of doing AR.

3.1.2. COMPARING AR TO OTHER RESEARCH APPROACHES

Be that as it may, my study bears resemblance to a couple of the other overall approaches mentioned by Launsøe & Riper (2005) above. My study is situated in a specific context, the Master programme of ICT and Learning (MIL), which is believed to influence the outcome of the study in a significant way, and the context is therefore part of what is being studied and not just an extraneous variable to be trivialized. For that reason my study could be characterized as a case study. Yin (2009, p. 18) defines a case study as "an empirical study that investigates a contemporary phenomenon in depth and within real-life context".

The main difference between AR and the case study approach lies in AR's specific purpose of not only aiming to understand, but also to change the real-life[16] context. Further, and as a consequence of the change aspect, in AR it is common for the researcher to take active part in the study as participant-observer, whereas in traditional case studies, the researcher typically remains observing. Both research types aim at understanding the research subjects' experiences, and according to Westlander (2006, p. 20), AR "is mostly carried out in the form of prospective case studies". In my study, I do refer to my research context as the MIL case.

Formative evaluation can be described as a research approach that is "naturalistic, process-oriented, iterative, and involve creating a tangible design that works in complex social settings" (Barab & Squire, 2004, p. 5). As a change oriented evaluation approach, it is especially attuned to assessing in an on-going way, any discrepancies between the expected direction and outputs of an intervention and what is happening in reality, to analysing strengths and weaknesses, and to generating understandings. As such there are also obvious parallels between AR and formative evaluation. However, the latter is often applied in large-scale projects (such as implementing new study programmes), and according to Chacon-Moscoso, Anguera-Argilaga, Antonio & Holgado-Tello (2002), formative evaluation is best used in the ex-ante and mid-term phases of research projects. Moreover, formative evaluation is usually associated with testing theories (Barab & Squire, 2004), which my study is not.

One, relatively new[17] research approach that Launsøe & Riper (2005) do not mention in their overview is Design-Based Research (DBR), which also bears strong resemblance to AR. Wang & Hannafin (2005, p. 6) describe DBR as "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories". At a glance, DBR is definitely a relevant approach that could have been used, but three important aspects prevented me from doing so.

First of all, while DBR researchers often investigate familiar contexts, such as their work place, they rarely investigate their own practice (e.g. their own teaching), but that of other colleagues or practitioners. My study investigates the students' responses to a new technology, and consequently a new pedagogical design, but it is based my own teaching practice. Second, while DBR focuses on the research subjects/participants, they are rarely considered co-researchers or co-learners to the same extent as in AR (Magnussen & Sørensen, 2011). In my study, the participants/students played an important role in terms of ideation and determination of research objectives. Third, in DBR a predefined theoretical framework guides the design from the onset of the

[16] As I understand Yin "real-life context" is used contrary to controlled, experimental contexts.

[17] DBR's emergence is often credited to Ann Brown's (1992) ideas of using design experiments to create interventions in classroom settings (as cited in Barab & Squire, 2004).

research; DBR is theory-driven (Design-Based Collective, 2003). I did not start with a predefined theory to guide the design, but implemented elements of the theoretical framework as the research cycles progressed.

Conversely, Chotto (2010) investigated a meticulous application of the communities of practice framework in a setting[18] similar to mine based on a DBR approach. When delineating the difference between DBR and AR, Chotto building on Reeves (2000), argues that one of the main differences is that in AR "there is no effort to construct theory" that can guide design/practice (Chotto, p. 89). Reeves explains his reservations toward action oriented research approaches:

> Researchers with action goals are focused on a particular program, product, or method, usually in an applied setting, for the purpose of describing it, improving it, or estimating its effectiveness and worth. Sometimes called action research or evaluation research, research with action goals is similar to development research except that there is little or no effort to construct theory, models, or principles to guide future design initiatives. The major goal is solving a particular problem in a specific place within a relatively short timeframe. Some theorists maintain that this type of inquiry is not research at all, but merely a form of evaluation. (Reeves, 2000, p. 7)

Nonetheless, a couple of years later, Reeves and colleagues alleviate their disapproval of AR, but maintain that DBR has more to offer, because:

> Although action research certainly has merit (Reason & Bradbury, 2001), there is much more potential value in design research, because it combines seeking practical solutions to classroom problems with the search for design knowledge that others may apply. (Reeves, Herrington & Oliver, 2005, p. 107)

Even though I disagree that DBR per se has more to offer, Reeves and colleagues point to a fundamental challenge in AR that needs to be addressed. Established AR researchers are fully aware of the problems AR faces in terms of both integrating and generating theory (McKay & Marshall, 2001a, 2001b; Herr & Anderson, 2005; McNiff & Whitehead, 2006; Reason & Bradbury, 2006; Dick, 2007; Reason & Bradbury, 2009; Coghlan & Brannick, 2010). According to McKay & Marshall (2001a) this has to do with the dual imperative of AR mentioned in chapter one: the twofold obligation to focus on both research interests (theory) and problem solving interests (practice) simultaneously throughout the study, and this I will return to in more detail in section 3.2.1.

[18] Professional development of teachers in a Costa Rican university.

3.1.3. RESEARCH APPROACHES IN VIRTUAL WORLDS STUDIES

Taken as a whole, my study is situated within the field of educational research, and recent reviews show that research on the use of virtual worlds over the years have evolved from exploratory and descriptive studies to recent studies of more evaluative and change-oriented character (Beck & Perkins, 2014; Correia et al., 2014; Wang & Burton, 2013). As we saw in the previous chapter, within the field of education, exploratory studies continue to dominate research corroborating that even though research into virtual worlds, and SL in particular, "no longer is in its infancy" (Wang & Burton, 2013, p. 365), there is still plenty of uncharted territory to be discovered in these complex worlds.

In summary, I have chosen the overall AR approach because it aligns well with my fundamental beliefs, as expressed in the paradigm discussion, and with the purpose and context of my study. In the following sections I will elaborate on relevant details of AR to further strengthen my arguments for choosing this approach.

3.2. ACTION RESEARCH – GENERAL CHARACTERISTICS

In line with the discussion of paradigms above, AR can be seen as a research approach that is anchored in opposition to the positivist paradigm. This can be explained by the fact that AR fundamentally has different purposes, is based on different relationships between researcher and the object of study/the people involved, and not least because AR has different ways of conceiving knowledge and its relation to practice. In short, AR "represents a transformative orientation to knowledge creation in that action researchers seek to take knowledge production beyond the gate-keeping of professional knowledge makers" (Huang, 2010, p. 93), and pivotal to this approach is the researcher's work with the practitioners of the study. According to Reason and Bradbury (2009), the main characteristic of AR is that it:

- calls for engagement with people in collaborative relationships, "opening new communicative spaces" in which dialogue and development can flourish,
- draws on many ways of knowing, both in the evidence that is generated in inquiry and its expression in diverse forms of presentation as we share learning with wider audience,
- is value oriented, seeking to address issues of significance concerning the flourishing of human persons, their communities, and the wider ecology in which we participate,
- is a living, emergent process that cannot be predetermined but changes and develops as those engaged deepen their understanding of the issues to be addressed and develop their capacity as co-inquirers both individually and collectively,

- is a set of practices that respond to people's desire to act creatively in the face of practical and often pressing issues in their lives in organizations and communities (Reason & Bradbury 2009, p. 3-4).

Participation and democracy – engagement with people

AR is founded in a belief that humans can work and learn creatively together. It is participative, aiming to engage those involved in the action as co-researchers and equal partners, rather than research objects. AR is only possible with, for and by persons and communities ideally involving all stakeholders both in the questioning and meaning making that informs the research and the action which is its focus (Reason & Bradbury, 2009, p. 4) Seeing that my study is based in a pedagogical context with an inherent uneven power balance, it would be naïve to consider the participants/the students "equal partners". Undoubtedly, it was I who "owned" the study's overall research problems, but seeing that the students' inquiries in the courses were very similar to my inquiry, I do consider the students' contributions, especially as reflective practitioners and not only as actors, as essential to the findings in this study.

Knowing-in-Action - many ways of knowing

Action researchers adopt a reflective and inquiring attitude to complex and disorganized human challenges by bringing research into everyday experience and practice, creating a distinct form of knowing which in turn informs experience and practice. The objective in AR is to include a wide range of knowing, including the experiential and intuitive, the aesthetic and presentational, the inter-subjective and relational as opposed to the dominant rational-mathematical (Reason & Bradbury, 2009). To increase validity, AR encourages individual and collective cycles of inquiry and reflection to systematically monitor the process. In this project, I have engaged with participants' accounts of their experience, their particular ways of making sense of things, and experiments in action over prolonged periods of time, and while doing so, we have collaboratively investigated and critically reflected upon the implementation of a new technology and the pedagogical design that has influenced this particular practice.

Human flourishing – value orientation

AR projects are value oriented and pursue worthwhile purposes as a way of contributing to the flourishing of human communities and the ecologies of which they are a part (Reason & Bradbury, 2009). In this study, my starting point was a curiosity concerning the implementation and impact of a new technology in a specific pedagogical community. The implementation process resulted in concrete practical issues that needed to be dealt with (cf. the study's problem solving interests), and in this sense, what was considered "worthwhile purposes" emerged and became addressed as part of the research process.

Emergent developmental form – a living, emergent process

AR projects bring discipline and system to people's natural and often disorganized/ messy learning processes. However, because it works with the messiness of everyday life, AR projects cannot be predefined in any detail (Reason & Bradbury, 2009). In my study, the research object understood as education in 3D virtual worlds, was relatively unexplored making it even more difficult to predict and plan for action in advance.

Practical issues – addressing practical challenges

A primary purpose of AR is to produce practical knowledge, which is useful to people in their everyday settings, but AR has a wider purpose of contributing to the research community as well. This dual imperative of AR is emphasized in Reason & Bradbury's statement "action without reflection and understanding is blind, just as theory without action is meaningless" (2009, p. 4). The purpose of my study has been to gain understanding and practical knowledge of how a specific community of pedagogical practice would respond to 3D-remediation through the implementation of SL, and here the purpose of this dissertation is to critically reflect upon and share these findings.

In relation to addressing practical challenges, it is important to take note of Reason and Bradbury's point about AR being "a set of practices" insofar as this designates that AR is not a single, uniform approach, which includes a predefined use of particular methods. In the academic community, some authors use the term action oriented research (Coghlan & Coughlan, 2010), while others use the term AR as overarching descriptor for the same type of research (McArdle & Reason, 2008; Reason & Bradbury 2009). McArdle and Reason (2008) list nine varieties of AR and argue that the basic process of AR depends on different schools of practices.

On the other hand, Raelin (1999) uses the term action strategies to distinguish between six dominant ways of doing research based on action. The main purpose in *AR* is social change through involvement and improvement, in *Participatory Research* it is to improve the quality of life in a community based on democratic values, and in *Action Learning* the main goal is to understand and change through action learning, which then can be characterized both as a research approach and a learning strategy. In *Action Science* the main purpose is to understand change in reasoning and behaviour aimed at improved human conditions, change is also investigated in *Developmental Action Inquiry*, which also focuses on continual feedback processes, and finally *Cooperative Inquiry* has practical knowing and human flourishing as main research purpose.

While the differences between these six strategies seem subtle, their respective proponents may nonetheless point to important disagreement due to their ideologies. One issue that has led to some discussion among AR scholars in the past is whether AR in general can be conducted in ways that are consistent with existing paradigms, including the positivist paradigm or if AR should be considered a paradigm in itself.

According to Kock (2011), there is serious resistance in some AR circles against the notion of positivist AR, and he mentions Paulo Freire's Participatory Research[19] and John Heron's Cooperative Inquiry[20] communities as examples where it would be unthinkable to use positivist approaches and methods. According to Nielsen & Nielsen most action researchers agree on the ontological assumptions, but "in terms of epistemology, we see strong disputes among different schools of Action Research" (2006, p. 73).

In line with this, Herr & Anderson (2005) identify three overall knowledge interests that the researcher can pursue in terms of knowledge generation:

1. **technical** interest aimed at explanation through empirical facts and generalizations,
2. **practical** interest aimed at understanding participants through illustrations, and finally
3. **emancipatory** interest aimed at releasing human potential through critical reflection of ideology and power

Within educational AR, the practical approach has been dominant (Magnussen & Sørensen, 2011), and this is also how I would characterize my study. Consequently, because of the various aims and ways of conducting AR there is no single, agreed upon definition, but for the purpose of my study, I have chosen the one proposed by Reason & Bradbury (2009):

> Action Research is a participatory process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons in their communities. (Reason & Bradbury, 2009, p. 4)

In my point of view, this definition captures the essence of AR. As I see it, one of the most important differences between AR and other research approaches lies in its core principle of recognizing that a social system only can be genuinely understood if the researcher is part of the system being studied. Ideally, the AR approach thus generates a commitment from the members of the system being studied, which fosters collaboration and enables negotiation of meaning between both the members and the researcher, and not exclusively between the researcher and the data.

[19] The Participatory Action Research Collective: http://www.freireproject.org/content/participatory-action-research-collective

[20] The South Pacific Centre for Human Inquiry: http://www.human-inquiry.com/jhcvpubl.htm

3.2.1. THE AR PROCESS – THE DUAL IMPERATIVE

Many authors have developed graphical representations of the AR process. Carr & Kemmis (1986) proposed a cyclical process alternating action and critical thinking, with steps of planning, acting, observing, reflecting and planning again. Susman & Evered (1978) presented a more complex model, which is composed of a cyclical process of five phases: diagnosing, action planning, action taking, evaluating and specifying learning. Most of the models of the AR process refer to planning, action, observation, and reflection as the central elements, and are based on Lewin's original description of AR. Lewin (1946) introduced and coined the term AR in an article entitled "Action Research and Minority Problems" where he described AR as a comparative research approach on the conditions and effects of various forms of social action and research leading to social action. Lewin affirmed the idea that a practitioner's reflection on knowing and reflection in action can lead to actionable theory that can be generalized to other situations. Lewin envisioned this type of research as a spiral of steps, each of which is composed of a basic cycle of activities:

1. Identify a general idea/objective,
2. Engage in reconnaissance – find facts that can shed light on the situation/object of study,
3. Make a general plan – based on evaluation and reflection of the facts, modify plan if necessary,
4. Develop and implement the first action step,
5. Evaluate, and revise the general plan. (Lewin, 1946, pp. 38-39)

From this basic cycle, the research then spiral into an undefined number of new cycles of action followed by reflection until a satisfactory result has been achieved. Nonetheless, the notion that AR is seen as one single cycle of activity, which is repeated, can be somewhat misleading because it is at risk of failing to address the dual imperative of conducting action and research (McKay & Marshall, 2001a). However, before turning to this point, McKay & Marshall (2001b) present two possible situations that would initiate AR projects. The first situation results in research-led AR, which is characterized by a research interest that precedes and possibly initiates the search for the occurrence of a real-life problem. By contrast, in the second approach, problem-led AR, the need or opportunity to solve a real world problem starts or shapes the research interest.

As stated in chapter one, my approach is research-led. My research interest that initiated this study was a curiosity concerning the implementation and use of a new technology in an already existing pedagogical community. Because of the novelty of the use of 3D virtual worlds in distance education, I had no clear idea of how the community would react. Further, because I was given the opportunity to use an existing course in the MIL programme for the intervention, I relied on the existing design and the existing theoretical framework in the first research cycle – both of which were developed and

employed by my colleagues several times prior to my research. Nevertheless, the implementation of the new technology unsurprisingly resulted in various problems of both technological and pedagogical character that called for further interventions, and in this respect it could be said that my research in the three remaining research cycles became more problem-led or at least problem oriented. In practice, once the planning of the research is done, the boundaries are blurred, and in line with Mackay & Marshall, it is my experiences that focus on research and action/problem solving oscillate.

Regardless of how an AR project is initiated, Mackay & Marshall (2001a) note that the most common representation of the AR process is as a single cycle (with possible iterations). Further, this cycle can be passed through once (called linear AR), it can be repeated in the same context, or a similar process can be applied in a number of different sites (called multiple iterations of AR). The authors are not concerned with whether or not multiple iterations of the AR cycle should be implemented, but whether AR rightly can be conceptualized as consisting of a single cycle (Mackay & Marshall, 2001a.). In this respect Mackay & Marshall draw attention to the dual imperative of AR as the combination and interdependence of action and research, of theory and practice, and state:

So, conceptually at the very least, there appears to be two AR cycles, one overlaid on the other, and operating in tandem with one another. The first cycle relates to the researcher's problem solving interests and responsibilities, the second to the researcher's research interests and responsibilities. (Mackay & Marshall, 2001a, p. 50)

This leads to two different cycles, a research interest cycle (RI-cycle) and a problem solving cycle (PSI-cycle) that ideally should be conducted simultaneously. By clearly acknowledging the dialectic relationship between research and action, AR distances itself from mere consultancy[21], which according to the authors resembles the problem solving cycle. The dual cyclic AR process leads to delicate, but important dissimilarities in foci and actions at different stages in the overall AR process as shown in table 3.2. next page.

[21] Huang (2012, p. 95) concurs stating that AR "stretches beyond" a consultancy because of its dedication to engage more systematically with knowledge creation, and because AR always includes practitioners, whereas consultancy is done for practitioners.

Overview of the dual cyclic AR process		
Stage	**Research interest (RI-cycle)**	**Problem solving interest (PSI-cycle)**
1	Research theme, interest, and RQ	Problem identification
2	Reconnaissance, fact-finding in relevant literature	Reconnaissance, fact-finding about problem context, stakeholders etc.
3	Planning and designing research project to answer RQ	Planning problem solving activity
4	Action steps 1,2,3 …	Action steps 1,2,3 …
5	Implement	Implement
6	Monitor in terms of research interest	Monitor in terms of problem solving efficacy
7	Evaluate effect of intervention in terms of RQ	Evaluate effect of actions on problem
8	Amend plan and design if further explanation and research are required, or exit if RQ are satisfactorily answered	Amend plan if further change is desirable, or exit if outcomes are satisfactory

Table 3.2. Overview of the dual cyclic AR process. (Mackay & Marshall, 2001a).

As mentioned in chapter one, I have identified both research interests (RI) and problem solving interests (PSI) in the different AR cycles of my study. An example of the differences between the two types of cycles could be in MIL08 case, where my PSI was concerned with solving a problem of lacking engagement and participation among the students by developing and implementing a variety of activities in SL. Concurrent to solving this problem, my RI was to study how such activities would impact the community in more general terms (as general response to the 3D-remediation), and how such activities more specifically could contribute with data concerning the students' experiences of teaching and learning processes in SL through the avatar.

Keeping the dual imperative in mind by identifying both research and problem solving interests is one of the ways to meet the criticism that AR focuses too much on practice/practical outcomes and too little on theory/research. Another way of doing so is to focus on and use different inquiry strategies.

3.2.2. THE THREE INQUIRY STRATEGIES OF AR

As stated by Coghlan & Brannick (2010), an integrative approach to research incorporates three voices and audiences: the first, the second, and the third persons. This specific inquiry/practice developed by Torbert (2006) provides a lens whereby the researcher's individual inquiry and learning is implemented in collaboration with others and both (first and second person practices) can lead to dissemination to the impersonal third party audience. Conversely, traditional research has focused mainly on third person practice: researchers conducting research on third persons and disseminating for other third persons. However, in AR and other transformative approaches a more authentic third person also integrates first and second person voices. According to Torbert (2006), while each strategy has distinct features, they are highly interdependent as well because they comprise the deliberate correlation between the personal, the relational, and the organizational levels in AR:

> First-, second-, and third-person research/practice mutually generate, require and reinforce one another because each is the preparation to welcome rather than resist timely transformation, at the personal, the relational and organizational scale, respectively. (Torbert, 2006, p. 213)

All three practices have been applied in my study. **First-person research/practice** is related to the subjective voice that addresses the ability of the individual researcher to foster an inquiring approach to his/her own practice. It is typically characterized as forms of inquiry that the researcher does on his/her own and includes reflection on personal basic assumptions, values, wishes, and intentions (Coghlan & Brannick, 2010). In my study, first-person research practice has mainly been applied through field notes, memo writing during the analysis and not least through writing on my research blog. From 2008-2013, I have written 195 blog posts directly related to my study. With an average of 500 words pr. post, blogging has been a very important part of my research process.

Second-person research/practice is related to the intersubjective voices that occur as the individual researcher inquires with others into issues of mutual concern through dialogue and joint actions (Coghlan & Brannick, 2010). This type of practice is executed in collaboration with multiple stakeholders. Second-person research practice has been applied in a number of ways during my study. The continuous dialogue and interaction with the students throughout the research cycles, and the dialogue often initiated by my blog-posts, typically with other educational researchers and general users of 3D virtual worlds have been of crucial value (e.g. my conversation with Richard Bartle and SL users). I return to the importance and impact of blogging about my research on several occasions. Additionally, in terms of second-person practice, Coghlan & Brannick (2010) highlight the doctoral student's work with her supervisor(s) and local research colleagues. In my study, I have been privileged by continuous dialogue with both my

supervisor and my colleagues at MIL, and with my local research community in the Dept. of Communication, in particular in the e-Learning Lab, throughout my study.

Third-person research/practices is related to the objectivity-seeking voice that includes a range of practices, which attempts to create conditions that awaken and support the inquiring qualities of first- and second-person research/practice in a wider, often impersonal community (Coghlan & Brannick, 2010). Third-person practice has been applied in a number of ways, as well. In the course of my PhD period I have written/co-written three papers related to my research (Riis, 2010; McKerlich et al., 2011; Childs, Riis & Nadolny, 2011). Peer-review and the process of co-writing have proven fruitful in making sense of what I experienced in my research practice and have shaped my thoughts and understanding of the research field. Valuable objective, but informed feedback has also been provided to me in relation to the different talks/presentations I have given both inworld in SL and in RL throughout my study.

Especially in the early years of my study (2007-2009), I was involved in several inworld research groups/SIGs (e.g. ARVEL SIG[22], Distance Educators, and Virtual World Best Practice in Education group) which provided plenty opportunity to discuss research findings and challenges in a more informal manner. The access to a highly active and generous inworld research community should not be underestimated. Being a newcomer in the research field of 3D virtual worlds has in many ways been a daunting and challenging role, but with the help of competent SL colleagues, I have learned to appreciate the history and nuances of the field. Finally, this dissertation represents the standard academic way of engaging with the third-person practice.

Summing up, the main purpose of applying several inquiry practices/voices is to facilitate continuous reflection and to ensure that this reflection is brought into the open so that it "goes beyond privately held assumptions", and this is particularly important for researchers conducting insider AR (Coghlan, 2007, p. 301), which has to do with the way the researcher positions herself in the study.

3.2.3. POSITIONALITY IN AR – INSIDER RESEARCH

Herr & Anderson (2005) propose a continuum of six different positions the action researcher can assume ranging from (1) Insider studying his/her own practice to (6) Outsider(s) studying insider(s). The way the researcher positions herself in the research affects the researcher's decisions on crucial levels such as in terms of epistemology and methodology and not least in relation to ethics.

According to Herr & Anderson (2005, p. 32) "insider practitioner research is most common in education", and in terms of position, my study is no exception as it falls into the category of "Insider in collaboration with other insiders (2)". The MIL

[22] Applied Research in Virtual Environments for Learning. Homepage: http://arvelsig.ning.com

programme is the organisation where I have worked prior to and throughout my official PhD-period meaning that I have assumed the dual role of employee (as teacher) as well as the role of researcher (as PhD-student). Given my position in the MIL programme I am researching "a familiar culture" (Mann & Stewart, 2000) which provides me with a unique pre-understanding of the participants, the practice, and the organisational and pedagogical context of the study. Although I do consider my background knowledge of the MIL programme an advantage, I also acknowledge that it might influence my interpretation of the invention and the data in an undesirable way, because there is a risk of "blind spots" (Mann & Stewart).

Regardless of position, the AR researcher will experience challenges connected to her role, and for Herr & Anderson (2005), a common challenge for the insider researcher can be that she is firstly an employee, and secondly a researcher meaning that research could have an inferior priority. While this may hold true in many organisations, I have been privileged by doing my study in a research organisation, which means that I have not encountered some of the otherwise common obstacles (e.g. lack of understanding the importance of doing research in the first place, lack of access, lack of participants etc.). Nonetheless, while MIL is a research organisation, it is also an educational programme and as such I have in fact encountered some ethical quandaries. Because I consider the participants in my study to be students rather than informants, I have tried very consciously to design the interventions in a manner that first and foremost would facilitate the students' learning, secondarily facilitate the research project and process. In hindsight a stronger focus on the research components of my study could have provided more and different data, and one could therefore argue that I have experienced some of the dilemmas of the dual role Herr & Anderson (2005) refer to.

Another aspect of this dilemma, which I have already touched upon, has to with the ownership of the research: who defines the research problems/questions, who interprets, understands and theorizes the change processes? Essential to all types of AR is the wish to include the research participants as much as possible in ideally all phases, including problem identification, of the research. But as I have already mentioned, my study is research-led and it is I who defined the initial research questions. Even though it could be argued that an improvement of the MIL programme's learning environment (which is the implicit goal of the study) would benefit the students, research tends to be long-term, and students are, rightfully, more concerned with their current situation that the future (of the programme).

Nonetheless, in a manner of honouring the core principles behind AR, I have tried to involve the participants in several ways throughout the study. Yes, I defined the initial research interest, but as it happens it correlates with the broader study interest of the participants (understanding and improving virtual learning environments). Furthermore, in the respective research cycles, I have engaged in many conversations with the students, listened carefully and whenever possible I have acted proactively in relation to the students criticisms and suggestions for improvement. In the second to

fourth research cycles, I also started out by reporting the research findings from the previous cycle(s) to illustrate the importance of the students' contributions and how I included these in the continued improvement of the course and the study.

Despite my efforts to include the students as active, and in some sense equal participants in a collaborative inquiry, the fact that my study has been undertaken as an insider project conflicts my intentions. It may be that I as researcher intended to create reciprocity[23], but my role as teacher unmistakably placed me in a power position that cannot be ignored, but should be treated as a bias. These challenges stemming from my insider and dual role all relate to the quality of the research, which I will return to later in this chapter and again in the final chapter.

3.3. GENERATING A DATA ARCHIVE

In this section I present my data archive and the methods I have used to generate and collect data. According to Rapley (2007), researchers today have a large range of technologies that allow them to generate, access, store, and engage with a vast array of materials. On a practical level, the potentially never-ending sources of materials to conduct research on means collecting and managing a large corpus of materials that makes up what Rapley calls a "data archive":

> Rather than just think about "generating data", in any narrow sense, you to [Sic] need to think about generating or producing an archive – a diverse collection of materials that enable you to engage with and think about the specific research problem or questions. (Rapley, 2007, p. 10 – original emphasis)

Akin to the traditional distinction between primary and secondary data, Rapley (2007) distinguishes between researcher-generated (e.g. interviews and observations) and already existing data (e.g. prior research, media coverage of the research topic, and official documents - in my study, the MIL curriculum is such an example). However, as Rapley further notes, there is an assumption that the researcher is "somehow more "active" with the former category and reasonably "passive" or "neutral" in relation to the latter (Rapley, 2007, p. 9). The fact of the matter is that in both cases the researcher has to discover, collect and make decisions regarding the materials. Whereas scholarly work, such as doing a PhD, previously could be considered a secluded affair, today's possibilities for researchers to engage with their research field and the public through different means such as social media in particular, during the research process, has to some extend debunked the myth of the Ivory Tower.

[23] Defined as an on-going process of exchange with the aim of establishing and maintaining equality between parties in the research project (cf. Malter; Simich; Jacobson & Wise, 2008)

To this end, my colleague from AAU's e-Learning Lab, Malene Charlotte Larsen, based on her PhD-work, added a third category of data to Rapley's (2007): data generated by the research results, (Larsen, 2010). Working specifically with Youth and Social Networking Sites, Larsen describes the category (as part of a numbered list):

> 3. Data generated by my research results (i.e. parents' or teachers' reactions to my talks, comments on popular scientific articles written by me, comments on my blog, articles and newscasts about Youth and its use of social network sites referencing me; that is data that I more or less unconsciously have caused based on dissemination of my existing research). (Larsen, 2010, p. 81 – my translation)

It is worth noting that Larsen's category should be seen as a reaction to Rapley's comment on "passive or neutral" researchers (cf. the researcher's engagement with existing data):

> The fact that I have not been completely passive in relation to the latter category [already existing data] means that in my work, I need to operate with a third category (…). (Larsen, 2010, p. 80 – my translation)

The manner of engaging with data, and especially the dichotomy between objectivity and subjectivity in research, is often tied to the differences between quantitative and qualitative research. Characteristic of qualitative research is that there is less concern compared to quantitative research regarding the researcher's influence on the data. I am not suggesting that qualitative research in general is ignorant of such possible partiality, rather that it is treated as bias, recognizing that research cannot be value free, instead of being avoided. In fact, as we saw earlier, in AR specifically, there is an underlying assumption that in order to fully understand your research field, you need to engage in and with it, and generally in the interpretivist/constructivist paradigm there is acknowledgment of the impact of the researcher's own background and experiences (both past and immediate) on the research.

Elaborating on data collection, Rapley (2007) further calls for engagement with "naturally occurring data" based on observation as an important supplement to the other types of data. Rapley argues that a study, which for example only uses participants' own accounts (gained through interviews), would be problematic. To Rapley, gaining access to "naturally occurring data" is not a matter of obtaining data "untainted by the researcher's actions" (which he considers "an impossible dream" (2007, p. 21)), rather it is a matter of ensuring data quality. Gaining access to how people actually interact, rather than merely reporting what they say (think), they do, would according to Rapley (2007) increase the quality of any study. Evidently this depends on the research questions, but again, this point aligns well with the AR approach and its focus on action, observation and reflection. Engaging with different

ways of knowing is, as seen earlier, one main characteristic of AR (Reason and Bradbury, 2009).

In this study, I have generated and collected the materials that constitute my data archive in two distinct ways: through engagement in the four research cycles and through engagement in my Personal Learning Network (PLN). Inspired by the ideas from Rapley (2007) and Larsen (2010) respectively, table 3.3. below provides an overview of this study's data archive.

<table>
<tr><th>Engagement in the study's research cycles</th><th>Engagement in my PLN</th></tr>
<tr><td>4 offline, lectures/workshops</td><td>Online, participant observation in social media</td></tr>
<tr><td>1 online, evaluation survey</td><td>Online, participant observation in SL SIGs</td></tr>
<tr><td>1 online, group interview</td><td>Offline, participant observation in RL SIGs</td></tr>
<tr><td>Online, participant observation in FC</td><td rowspan="2">On-/offline, participant observation in the COMBLE and the UNA-AAU projects</td></tr>
<tr><td>Online, participant observation in SL</td></tr>
<tr><td colspan="2">Engagement on my research blog</td></tr>
<tr><td colspan="2">Engagement with prior and on-going research</td></tr>
<tr><td>Primary data

• researcher-generated</td><td>Secondary data

• already existing or generated by my research findings</td></tr>
<tr><td>Purpose:

Generate specific knowledge related to the study's research questions/field</td><td>Purpose:

Generate general knowledge related to the study's research field/questions</td></tr>
</table>

Table 3.3. Overview of engagement in different research settings.

Following AR's principle of engaging with the field of study, I have spent considerable time as an active participant and as an observer both in the research cycles (the intervention) and in other (mainly online) settings relevant to my study. For simplicity I have chosen to designate my engagement participant observation, but as we shall see

sometimes my role was leaning more towards complete participation and sometimes more towards observation. Whether data has been researcher-generated (as a direct result of my actions) or if the data results from my research findings can at times be difficult to determine. Regardless of how the data came to be, it has distinctive characteristics based on the methods used. However, before turning to an elaboration of the used methods, it should be noted that the majority of the generated data is in Danish[24] (the postings from FC and my field notes from FC/SL), so I had to make some decisions regarding translation. In the case of written data (such as the participants postings) Markham (2004) states that this kind of data should be transmitted to the readers exactly in the way they were written, with no corrections in spelling, grammar or punctuation and with no standardization of fonts. According to Newmark (1988), the central problem of translating has always been whether to translate literally or freely, and he distinguishes between two broad strategies that take into account either the source language author (exemplified via semantic translation) or the target language reader (exemplified via communicative translation).

Given that the translation process in itself is an interpretation, I have tried to stay as faithful to the source language authors, as possible. Semantic translation differs from "faithful translation" only in as far as it must take more account of the aesthetic value (e.g. the beautiful and natural sounds of the source language text), and it may make small concessions to the readership. The distinction between "faithful" and "semantic" translation is that the first is uncompromising and dogmatic, while the second is more flexible, admits the creative exception to complete fidelity and allows for the translator's intuitive empathy with the original (Newmark, 1988, pp. 47-48). Nonetheless, in some cases (especially in terms of word-play or use of idioms), it would have made little sense to the readers, had I not exercised a more free translation. I have, however, kept the original punctuation, abbreviations, and font format (i.e. in terms of capital letters or emphasis). Further, when needed, I have inserted square brackets with explanations to facilitate the communicative function of the translation. Finally, it should be noted that I have chosen to disregard Markham's (2004) recommendations in relation to spelling and grammatical errors or typos because I do not considers such characteristics relevant in the context of my study.

3.3.1. DATA BASED ON ENGAGEMENT IN THE STUDY'S RESEARCH CYCLES

Turning to the data generated through my engagement in the study's four research cycles, table 3.4. next page provides an overview of the methods used and the type of data material it resulted in.

[24] Except from the contribution from one participant in the MIL07 case who is Norwegian.

Method	Duration (Total in 4 research cycles)	Data material
Offline lectures/workshops	12 hours	Post-fact reflections, teaching materials
Online, evaluation survey	-	Written answers, statistics
Online, group interview, synchronous	1 ½ hour	Field notes, interview guide
Online, participant observation in FC, asynchronous	26 weeks	1.104 online postings, field notes, teaching materials
Online, participant observation in SL, synchronous	26 weeks 130 hours of scheduled inworld teaching Numerous hours of unscheduled observation	Field notes, pictures, teaching materials, inworld objects

Table 3.4. Overview of methods and data material.

Offline lectures/workshops

In the beginning of each research cycle, a three-hour lecture/workshop was conducted. These sessions were carried out f2f at one of the MIL university locations, partly as an introductory lecture to the phenomenon of virtual worlds as learning environments, partly as hands-on workshops focusing on basic functions in SL. In research cycles MIL07-MIL09 these sessions were offered to all MIL students and as such the participants were not restricted to the participants of the study[25]. Each lecture/workshop will be described a little more detailed in the chapter concerning the research cycles, but while these sessions were important to the course, only minor changes occurred over the years, and my focus in this study has been on investigating the activities in the online settings. In terms of collecting data from the f2f sessions, my role as complete participant and given the often times highly confusing and stressful

[25] As I will explain in chapter four regarding the context of the study, the MIL course where the intervention took place was optional and all MIL students could choose between different courses. Irrespective of this option, the introductory lecture/workshop was offered to all students regardless of choice. From 2007-2009 the students did not have to make their final choice until after the lecture/workshop, from 2010 this changed.

nature of doing hands-on exercises, meant that observations mainly consisted of post-fact reflections.

Online, evaluation survey

At MIL it is standard to send out online evaluation surveys after completion of courses and modules. This is done by MILs administration without teacher involvement. In relation to research cycles MIL07-MIL09, the surveys were targeting all of the study activities in the module and not this course in particular making the results useless. As an alternative I decided to conduct a group interview in MIL07, and in the MIL08 and MIL09 cycles I designed specific course-related questions for the participants to answer in FC. In 2010 the MIL evaluation practice changed so that evaluations were targeted single courses or modules, which enables me to include the results of one online survey related to the last research cycle.

In general, surveys are used as an easy way to acquire information from a larger number of respondents in a seemingly unbiased manner (Cohen, Manion & Morrison, 2007). There are, however, also some important disadvantages pertaining to especially data quality (low response, quality of the questions, the possibility of respondents being dishonest, risk of misinterpretation etc.). Nonetheless, because I am investigating my own practice, I have found it important to include this type of more objective data as a supplement to my own findings.

Online, group interview

In January 2008, approximately one month after the completion of the first MIL07 research cycle, I decided to conduct an online, synchronous group interview with five students via Skype[26]. In qualitative research, interviews are particularly useful for gaining understanding of peoples experiences and self-understanding about their lived world. As maintained by several authors, (Lindlof & Taylor, 2011; Kvale, 1996; Rasmussen, Østergaard & Beckmann, 2006) a good interview is based on dialogue that leads to shared understanding, and interviewing can therefore be seen as a social construction process:

> Ideally, what emerges is a richly expressive inter-view that neither person could have produced alone. (Lindlof & Taylor, 2011, p. 171 – original emphasis)

As I will explain in chapter five, the online activities and discussions in the MIL07 cycle, mainly took place in the course's asynchronous setting, the FirstClass (FC) platform. By design there were only five scheduled inworld sessions in SL and by the end of the course it became evident that I needed to talk more focused with some of

[26] Given recurring technical challenges and often quite poor sound in SL back in 2008, I decided to conduct the interview in Skype.

the students in order to fully understand what had happened during the course. On January 7th 2008, I posted a message to all the students in the FC environment and asked for volunteers for the interview. The five students who ended up participating all matched the general profile of the MIL students.

In general, qualitative interviews can vary in form (i.e. length and location) and content. The latter is determined by how structured the interview is varying from very structured to completely unstructured and this depends entirely on the issue that is to be examined (Rasmussen, Østergaard & Beckmann, 2006). Besides completely unstructured interviews, most interviews are structured according to a guide, which normally contains a brief overview of themes, possibly with some subsidiary topics. In semi-structured interviews, a guide is prepared but it is sufficiently open-ended to enable the researcher to change sequences, re-order the content, and include new questions (Kvale, 1996). Through participant observation I had gained a preliminary sense of what had happened during the course.

Nonetheless, because this interpretation of mine was based predominantly on asynchronous communication, I wanted to use the interview to present my initial understanding to the students for them to comment on my interpretations. Therefore I prepared a short summary of my initial findings (as a PowerPoint™ presentation) and included a couple of central questions. The presentation focused on the following topics:

- SL as analytical object in relation the curricular goals of the course
- SL as VLE for this particular target group (incl. the students' prerequisites)
- SL and the learning processes (incl. interaction and communication possibilities)
- SL and teacher role/facilitation
- The avatar phenomenon and possible relations to the students' identities

I asked the participants in the interview to study my summary in advance, and during the interview the presentation served as semi-structured guide for the dialogue.

Multi-sited, online ethnographic approach

An important part of my data has been generated through some form of observation. As research method, observation was originally developed within the field of anthropology among ethnographers who often had to settle for observing activities and interactions in foreign cultures until they had learned the native language (Rasmussen, Østergaard & Beckmann, 2006). It is worth noting that observations are not restricted to ethnographic studies, neither are all kinds of observations ethnographic in the strict sense of the word. Ethnography can refer to both the approach and product of the research. In my understanding the latter, an ethnography is a comprehensive, thick description of a culture, whereas my account of the MIL case in this study is

comparatively limited insofar as I restrict in-depth analyses to selected phenomena and the course that I designed, observed and analyse only represents one aspect of the whole MIL culture. The same limitations could be said in terms of studying SL as a culture[27]. For these reasons, I am by no means claiming to have written an ethnography, but I have been inspired by the ethnographic approach in terms of sustained long-term engagement in my field of study (from 2007-).

Online culture, such as it is expressed in virtual (learning) environments, is a relatively new area of ethnographic research, which was initially developed in relation to text-based communication (Hine, 2000; 2008). In recent years, ethnographers have moved on to study online culture in 3D virtual communities, games, and worlds as well (Boellstorff, 2008; Hine, 2008). According to Hammersley (2006, p. 4), ethnography is concerned with the study of "what people do and say in particular contexts". Even though ethnographic research has changed its field of study in terms of materiality, Hine (2008), reminds us that online settings are part of social reality and as such worthy of study. Following the arguments of Hine (2000; 2008), I make no qualitative distinction between on- and offline contexts in my study. In terms of online contexts, I have conducted participant observation in the MIL programme's official virtual learning environment, FC and in SL.

Online, participant observation in FC

In the case of online interaction in FC, the data included all postings in the virtual environment that were automatically archived by the FC system and could be accessed later for analysis. However, the postings could only be accessed online, so I decided to print them, thus enabling me to work offline. Data from FC include the text of each posting, the forum where the message was posted, the date and name of the participants (students, a co-facilitator in MIL09, and I).

In what follows, I have decided to refer to the different forums in which the postings were posted without the participants' names to ensure anonymity. An example could be: (MIL07-FC-discussion-November) - referring to a posting in a discussion forum in November in the MIL07 cycle. Exact dates could also lead to recognition of the authors, and have therefore been left out as well. The design and purpose of the FC-forums is briefly explained in each research cycle, and all the FC forums referred to are listed in table 3.5. next page.

[27] Boellstorff (2008) is an excellent example of such an ethnographic account of the SL culture.

Cycle	FC forums (total)	FC forums (quoted)
MIL07	MIL06 M4 – Second Life MIL06 (m4c1) K-gruppe 2, 3, 4, 5, 8 & 9 Main conference	MIL07-FC-discussion-November MIL07-FC-discussion-December
MIL08	MIL07 (M4C1) Avatarer SL tutorials Urls og SLurls SL besøg SL ressourcer SL Didaktik og Målgrupper, Orientering og navigation, Interaktivitet, Læringsforløb og processer, Audio og visualisering Main conference	MIL08-FC-discussions-November MIL08-FC-discussion-December MIL08-FC-main conference-November MIL08-FC-main conference-December
MIL09	MIL08 (m4k1) SL Didaktiske Diskussioner MIL08 (m4k1) Meta-refleksioner MIL08 (m4k1) Avatarer MIL08 (m4k1) SL in-world MIL08 (m4k1) SL Ressourcer Main conference	MIL09-FC-discussions-November MIL09-FC-discussion-December MIL09-FC-Meta-reflection-November MIL09-FC-Meta-reflection-December MIL09-FC-avatars-November
MIL10	MIL10/11 VM SL Didaktiske Diskussioner MIL10/11 VM SL Motivation og refleksion MIL10/11 VM SL Avatarer MIL10/11 VM SL Ressourcer MIL10/11 VM SL in-world Main conference	MIL10-FC-Didactic Discussion-January MIL10-FC-reflections-January MIL10-FC-reflections-February MIL10-FC-avatars-October

Table 3.5. Overview of FC forums.

Since the course was placed in the second study year, in the FC logic the students belonged to MIL06, which explains the prefix, and why the prefixes throughout this study appears to be dated by one year. It is also important to note, that while I have read all postings, I have not used postings directly from all the forums in my analyses. In the MIL07 cycle for example, I have only used postings from the students' course group forums (K-gruppe). To ensure student anonymity, I have referred to these forums as MIL07-FC-discussion. In the MIL08 cycle, the students discussed designated topics in five forums (SL Didaktik etc.) and these I refer to as MIL08-FC-discussion. During the four courses, my role in FC was predominantly that of a teacher/facilitator. Given that my focus is on SL, my research observations in/from FC were mainly conducted after the courses ended when I started analysing the postings.

Online, participant observation in SL

In the case of online interaction in SL, the data included inworld snapshots, screenshots, and my field notes. My role in SL was double as teacher/facilitator and as researcher. Depending on the type of inworld activity, the students and I were engaged in, my focus oscillated. Some activities, such as inworld lectures, made it almost impossible to escape the participant role leaving no room for synchronous observation. Other activities, such as students' presentations and visits, made it a bit easier to assume the role of an observer. Nonetheless, in almost all of the inworld sessions, there were technical issues to attend to and numerous chats to keep an eye on (with individual students, groups of students, and other SL-users). In general, a high level of multi-tasking is required when being inworld, and therefore my observations from inworld were typically very brief during the sessions, which is why I made it a habit to reflect on the sessions both straight afterwards (typically at around 11 PM) and the following day. Oftentimes these notes and reflections were transformed into blog posts. Below is an example of how this process played out:

On Monday, November 12th, 2008 a group of MIL08-students and I were visiting the so-called Metanomics show, which best translates to a live TV talk show with a host (Professor Robert Bloomfield/Byers Sellers in SL), invited guests, and a live audience. During the show, I took several snapshots, screenshots, and wrote a few keywords:

- multiple residents - lots of lag .. again :-(
- multiple-chats/IMs - students clearly confused
- communication unclear
- students leaving early :-(

After I logged out of SL that evening, I simply added a few lines to my notes:

- cacophony - constructive? not so much!
- remember to address chat-etiquette
- Metanomics probably too confusing for newbies
- multiple chats/IMs = major challenge to the facilitator .. and probably to the students as well

Approximately a week later, and after having visited the Metanomics show once again, I reflected on the challenges of inworld facilitation and this experience on my blog:

> (...) A good feature for this of course is the IM, which makes it possible to text without interrupting the whole group. This is something not possible in real life, and I do think that it is quite smart, but I also have to say that it is fairly demanding on the facilitator. I suppose the ability to text chat with several participants simultaneously is a skill that "just" needs to be learned, but I can't

> help wonder if this rather complex way of communicating would discourage some potential teachers from trying out SL or similar environments.
>
> The last 2 Mondays I've been attending Metanomics meetings with students, and on these occasions I had respectively 10 and 12 active chat windows, so my immediate impression was that I spent most of my time paying attention to the chats rather than the speakers. The main reason for attending these Metanomics meetings, was to show the students this particular way of communicating, "Constructive Cacophony" as Bloomfield calls it, so the content wasn't all that important. I will return to the content issue in another post, but for now I just want to reflect on the possibility of using text and voice simultaneously. At the Metanomics meetings Bloomfield is assisted by moderators, and if we transfer this to an educational setting the solution could be to have more than one teacher or perhaps a TA.
>
> Another option is to limit the text chat and ask participants to use a certain group chat only. This might work well, and we'll experiment with that down the line, but here in the beginning of the course, I believe that it is very important not to limit the students' use of IMs to the facilitator. It's my clear impression that the IMs serve as an invaluable support giving especially less confident students a communication channel where they do not need to "expose" their inexperience and/or insecurity. The trick here – just like in real life – is to create an atmosphere where no questions are too small or too stupid. On the other hand, it is also my impression that the students choose IM because they experience this as being more polite than interrupting the activity with personal /individual questions, and this may be because we have not yet reached consensus on how to communicate in these inworld situations.
>
> Finally, from another perspective this possibility to pose individual questions during group activity may enhance inclusion in a way not possible without technology mediation, and this is truly where I begin to see SL as a strong learning environment … even though it initially challenges both the students and the facilitator :-). (Riis, 2008, November 18th)

While sketchy and oftentimes very messy in nature, my different types of field notes as a whole contributed to new findings that I could use both as a teacher/facilitator and as a researcher. Depending on my research interest (RI) and my problem-solving interest (PSI) in the cycles, the focus and nature of my field notes differed, and my notes also changed over time.

As stated by Hammersley & Atkinson (1995, p. 180), field notes will become "more restricted in subject matter" as the research progresses. Given that a Grounded Theory-approach in terms of generating and analysing data has inspired me, the event of "theoretical saturation" also influenced this process. In the later cycles, phenomena

happening inworld ceased to surprise me, and I could almost predict how and when the students would react, making it much easier to engage in the field as a teacher/facilitator, but less revealing as a researcher. In what follows, I refer to my field notes in terms of "Books" related to each cycle.

3.3.2. DATA BASED ON ENGAGEMENT IN MY PLN

During the course of my PhD-period, I have been active on several social media (Facebook, Twitter, and my blog in particular) in an effort to cultivate my PLN and use it deliberately in my research process. Bennett & Wiebrands (2010, p.2) define PLN as "a group of people who can guide your learning, point you to learning opportunities, answer your questions, and give you the benefit of their own knowledge and experience". Furthermore, a PLN involves an individual's topic oriented goal, a set of practices or techniques aimed at attracting or organizing a variety of relevant content sources, selected for their value, to help the owner accomplish a professional goal or personal interest. Making use of and recognizing the impact that my PLN has had on my research, is part of what Weller (2011) characterizes as the new, digital scholarship.

As mentioned earlier, it can be difficult to distinguish whether data in my study emerged as a result of my actions (researcher generated) or if the data resulted from my findings. For example in the case of blogging, I know that the some of the participants in the study have been active readers of my reflections, and this may have influenced their perceptions and future actions. Similarly, in the case of engaging with prior or existing research, I have occasionally received recommendations from my readers (typically other researchers and/or SL educators, whom I did not necessarily know in advance), and one could argue had I not expressed my research interests publicly, I would not have discovered the data. Thus, what often had an unsettling appearance of pure luck turned out to be serendipitous resulting from my own activity, and this is probably one of the strongest arguments for scholarly blogging as part of cultivating a PLN. Another important argument for blogging has to do with easy retrieval. The ability to "tag" blog posts makes it easier to search and find certain posts, and due to the unlimited amount of tags (or categories as in my case), posts could be marked as interesting in relation to several topics. As already shown, I have made use of my blog posts in many ways.

3.4. DATA ANALYSIS

In this section I present my process of analysing and interpreting the data.

3.4.1. CONTENT ANALYSIS INSPIRED BY GROUNDED THEORY

Content analysis is a method of analysing written, verbal or visual communication (Elo & Kyngäs, 2008). According to White & Marsh (2006) content analysis has its roots in the study of mass communications in the 1950's where it was first used to analyse

hymns, newspaper articles and political speeches. Based on a basic communications model of sender/message/receiver, initially researchers emphasized making inferences based on quantified analysis of recurring, easily identifiable aspects of text content, often referred to as manifest content (White & Marsh, 2006). Since then content analysis has been applied in a range of different research fields (e.g. anthropology, sociology, information studies, business and management studies and nursing). In the literature there is no single, agreed upon definition of content analysis and researchers also disagree on whether it is a method that should be used with either quantitative or qualitative data. As an example of the former Neuendorf (2011) states:

> Content analysis is a summarizing, quantitative analysis of messages that relies on the scientific method, including attention to objectivity/intersubjectivity, a priori design, reliability, validity, generalizability, replicability, and hypothesis testing. It is not limited as to the types of messages that may be analysed, nor as to the types of variables that might be measured (Neuendorf 2002, p. 10 – as cited in Neuendorf, 2011, p. 277).

Quantitative content analysis thus allows a large amount of textual data to be reduced into numbers and frequencies that are suitable for statistical analysis (Pfeil & Zaphiris, 2010). However, as argued by Thomsen, Straubhaar & Bolyard (1998) reducing text into countable categories is at risk of missing the fine nuances, patterns, and meanings of human interaction, and the authors therefore recommend to complement and support with qualitative analysis.

The majority of the data, I have chosen for the content analysis consists of the 1.104 FC-postings mentioned above, and in this study, I consider the online postings as manifestations of social interaction and meaning – phenomena which, according to the paradigm discussion earlier, are best investigated with qualitative research methods. Field notes based on participant observation in SL, especially related to the scheduled 130 hours of teaching (cf. table 3.4), are used to complement and validate findings based on the postings.

As I see it, the choice of either quantitative or qualitative methods depends on the overall research approach and the research question(s). In the context of my study and in alignment with the AR approach and the purpose of my study, I have therefore chosen to use content analysis as a qualitative and inductive method and the rest of this section will focus of the specifics hereof accordingly.

In line with other researchers, Pfeil & Zaphiris (2010) see two main approaches towards content analysis, and they assert that organizing and coding (resulting in specific categories and themes) the data is part of both approaches, but:

> The difference is that quantitative content analysis emphasizes the statistical data (e.g. test hypothesis with quantified measurements), whereas qualitative

> content analysis focuses on the themes and topics of the categories and the distribution, meaning, and relations of them within the data under investigation. (Pfeil & Zaphiris, 2010, p. 7)

White & Marsh (2006) tie qualitative content analysis to a non-positivist, humanistic tradition and find it to be inductive because:

> Qualitative content analysis may yield testable hypotheses but that is not its immediate purpose. Replacing the hypotheses are foreshadowing questions, that is, open questions that guide the research and influences the data that are gathered. (White & Marsh, 2006, p. 34)

From this follows that as the researcher reads through the data and scrutinizes it closely some patterns and concepts may emerge that were not foreseen, but nonetheless will be important to consider. In this respect the process of inductive, qualitative content analysis resembles a hermeneutic loop based on recontextualisation, reinterpretation, and redefinement until some kind of satisfactory interpretation is reached (White & Marsh, 2006). Such an inductive approach moves from the specific to the general where particular instances are observed and then combined into a larger whole or general statement. Hence, the inductive approach is recommended "if there is not enough former knowledge about the phenomenon or if the knowledge is fragmented" (Elo & Kyngäs, 2008, p. 109). As I have previously mentioned, I identified a research gap concerning the use of 3D virtual worlds in distance education, and because I did not know what to expect from the 3D-remediation of the MIL course in my case, the inductive approach suits my research design well.

However, given the challenges regarding the role/use of theory in AR, I have further decided to combine my approach with selected elements from Grounded Theory (GT). Among others, action researchers Baskerville & Pries-Heje (1999) have argued for a combination of AR and GT called Grounded Action Research (GAR). I am, however, hesitant in naming my overall approach GAR. Key to traditional GT (as seen in Glaser & Strauss, 1967 and Strauss and Corbin, 1990) is that theory first and foremost must emerge from empirical data devoid of theoretical pre-understanding and this is one core principle I have been unable (and unwilling) to meet. On the other hand, GT offers a set of techniques to data organisation and analysis that I have found fruitful to apply in my study.

3.4.2. A BRIEF INTRODUCTION TO GROUNDED THEORY

Barney G. Glaser and Anselm L. Strauss (1967) are credited with founding GT. Even so, the notion of what is traditional GT is somewhat problematic, because much to the dismay of Glaser (1992), Strauss & Corbin (1990) made significant changes to the approach that came to be widely accepted. In the context of this study, the term traditional GT will be used when either the original theory of Glaser and Strauss or the

later formulated by Strauss and Corbin is followed to the letter. A common assumption, and often criticism, related to especially traditional GT, is that Glaser & Strauss completely rejected the influence of theory at the onset of research based on GT. It should, however, be noticed what Glaser & Strauss themselves noted in the beginning of their "Discovery of Grounded Theory":

> Of course, the researcher does not approach reality as a tabula rasa. He must have a perspective that will help him see relevant data and abstract significant categories from his scrutiny of the data. (Glaser & Strauss, 1967, p. 3)

According to Glaser & Strauss, their work focused on the "discovery of theory from data systematically obtained from social research", and their wish was to contrast this discovery with "theory generated by logical deduction from a priori assumptions" (Glaser & Strauss, 1967, pp. 2-3). Further, the principal aim of Glaser & Strauss was:

> [to] stimulate other theorists to codify and publish their own methods for generating theory. (Glaser & Strauss, 1967, p. 8 – original emphasis)

Central features of this analytic approach include the general method of concurrent data generation and analysis by means of constant comparative analysis and theoretical sampling, and the process ends with theoretical saturation - all based on the researcher's ability to exercise theoretical sensitivity (Glaser & Strauss, 1967). In traditional GT concurrent data generation and analysis means that data is collected, coded, and categorized simultaneously through constant comparative analysis. Subsequent coding will confirm or refine, extend and modify these categories to fit the new data, and new categories may emerge at this stage. Constant comparative analysis is described as a general method that can be used for social units of any size (Glaser & Strauss, 1967). The purposes of constant comparative analysis are to provide accurate evidence, enable empirical generalization, specify concepts, verify theory, but more importantly to generate theory:

> While verifying is the researcher's principal and vital task for existing theories, we suggest that his main goal in developing new theories is their purposeful systematic generation from data of social research. (Glaser & Strauss, 1967, p. 28)

Further, Glaser & Strauss (1967) emphasize that verification must not become so dominant "as to curb generation":

> Thus, generation of theory through constant comparative analysis both subsumes and assumes verifications and accurate descriptions, but *only* to the extent that the latter are in service of generation. (Glaser & Strauss, 1967 p. 28 – original emphasis)

Theoretical sampling is the process that governs this data collection procedure, in which the coding and analysis done at the initial stages determines the subsequent data to be collected.

> Theoretical sampling is the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyzes his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges (Glaser & Strauss, 1967, p. 45).

Unlike statistical sampling, theoretical sampling is the process of collecting data for comparative analysis, which is especially useful to facilitate theory generation. Again, it should be noted that while the researcher's initial decisions are not based on a preconceived theoretical framework, she might begin the research "with a partial framework of "local" concepts, designating a few principal or gross features of the structure and the processes" in the situation under study (Glaser & Strauss, 1967). Theoretical sensitivity refers to the competence needed to guide the process, and this is a two-part concept first consisting of the researcher's personal level of insight into herself and the area she studies. Second, a researcher's level of theoretical sensitivity reflects the sum of her intellectual history, their ability to think in theoretical terms, and knowing how to use these insights. As the researcher becomes immersed in the data, her sensitivity ideally increases.

Here it should also be noted that potential theoretical sensitivity is at the risk of being lost if the researcher commits herself exclusively to one specific preconceived theory, because "then he becomes doctrinaire and can no longer "see around" either his pet theory or any other" (Glaser & Strauss, 1967, p. 46). Memo writing is the process of documenting the researcher's thinking during the study, both in the field and during the analysis. Memos may vary greatly in terms of subject, intensity, coherence, theoretical content and usefulness, but are considered an integral part of the research.

In regard to the planning of a research study, Glaser & Strauss (1967) stress that beyond decisions concerning the initial collection of data further collection cannot be planned in advance. The emerging theory points to the next steps. As the study continues, data collection and coding are reduced as analysis and theory building become more dominant. Emerging concepts from the data are compared and contrasted with the literature to establish hypotheses, which are then refined and elaborated to develop theory. The research process is brought to a close when theoretical saturation is achieved, meaning that additional data, coding, or sorting would not contribute to the extension of the developed theory. Moreover, it is important to recognize that studying one incident in one group never can attain theoretical saturation:

> What is gained by studying one group is at most the discovery of some basic categories and a few of their properties. From the study of similar groups (or

> subgroups within the first group), a few more categories and their properties are yielded. But this is only the beginning of a theory. (Glaser & Strauss, 1967, p. 62)

Lastly, Glaser & Strauss (1967, p. 62) warn that to actually complete a theory "dozens and dozens of situations in many diverse groups must be observed and analysed comparatively".

As noticed above, at some stage in the process, the researcher starts to compare and integrate received (related) theory. The uncertainty of when (and how) to integrate theory, has been debated for decades, and according to Urquhart, Lehmann & Myers (2010), this has led researchers from other fields to view GT primarily as a way of generating and coding data, rather than a method to generate theory. As I stated in the beginning of chapter two, the confusion about the role of theory in GT in general, has also led to a "contentious debate" concerning the role of the traditional literature review in research and research dissemination, such as dissertations (Giles, King & de Lacey, 2013). In the description of the coding process and theory development in my study below, I will explain when, how and why, I have diverged from the traditional GT process.

3.4.3. THE CODING PROCESS IN THIS STUDY

As already mentioned, after completion of the MIL07 course, I read through the postings and compared with my different types of field notes in order to provide a summary for the interview, but it was not until later in 2008 that I started the more systematic coding process.

Open coding (generating concepts)

Based on my initial reading in the first phase in 2007, it had become obvious that the avatar phenomenon, as intriguing as it were, could not be understood devoid of context (here understood as a combination of the VLE and the pedagogical design), and this had been confirmed through the interview. I decided to print the data afresh and start a new reading. I still searched for references to the avatar, but instead of focusing solely on the topics from the interview I looked more broadly for references relating to the VLE and the pedagogical processes that had happened in SL. Consequently, I ended up structuring the data around three core concepts: participants, virtual environment, and practice. Next reading focused on defining sub-concepts that could inform the core concepts. During this process, I decided to colour code the data to facilitate a visual overview by means of using markers to highlight interesting passages in the text and not least post-it stickers, where I wrote summaries and initial thoughts/questions. Later in the study process, I used the colour coding to organize literature/theory in relation to the data. An overview of the results of this coding process is presented in table 3.5. below.

Open coding concepts and sub-concepts						
Core concept	**A** Participants - Students' responses		**B** Virtual Environment - Students' responses		**C** Practice - Students' responses	
Sub-concept	AA Behaviour	AAA Appearance	BB Resident	BBB User	CC Teaching	CCC Learning

Table 3.5. Overview of open coding concepts and sub-concepts.

As we shall see, the avatar phenomenon heavily influenced the students' experiences with SL throughout the study, and it was therefore quite easy to identify this concept. Core concept A was related to the students' responses to the avatar phenomenon, and included the students' experiences of avatar behaviour and avatar appearance. The next core concept was also quite easy to identify. Core concept B was related to the students' responses to SL, where it is possible to differentiate between experiences as a resident (a habitant of this 3D world) and experiences as a user of SL (a combination of traditional user experience combined with learner experience). Within core concept B, I also included the students' references to the FC environment given that the students often compared these virtual environments.

On the other hand, core concept C was initially far more difficult to define. This concept had to do with the students' responses to what happened in terms of learning in SL, but as we shall see, the pedagogical design of the MIL07 case did not include scheduled designed teaching and learning activities in SL from the start of the course. The lot of the MIL07 data connected to this core concept therefore consisted more of theoretical-analytical reflection, rather that reflection anchored in empirical experience. Based on observations during the MIL07 course, I decided to intervene by proposing a small number of activities. While these activities were not pedagogical by design, they did reveal some of the potential for teaching and learning in SL, and the students did respond to these activities by participating and reflecting on them both in SL and in FC. Furthermore, during the MIL07 group interview, I had been able to question the students about their experiences with learning in SL. Therefore, despite the data being less evident in terms of the teaching and learning practice in SL, I decided that these would still be viable concepts – if nothing else, and as a matter of fact quite importantly, in terms of lacking teaching and learning practice. In each consecutive research cycle, I started the analysis and coding process by organizing the data according to these core concepts and sub-concepts. Figure 3.1. below shows an example of an overview of the data in all four research cycles.

Figure 3.1. Overview of data from the four research cycles – concept coding.

As seen in figure 3.1. there was also a blue code. The blue code consisted of sub-concepts that were either unique to the case or less dominant in the data. For example, in the MIL07 case, the students were quite preoccupied with the commercial aspect related to economy/marketing in SL[28]. While economy and marketing are important issues, I have decided not to pursue them in detail in the context of this study. In the subsequent research cycles, the commercial aspect was more related to the general culture in SL and in particular to the default avatar appearance referred to as the "Ken and Barbie look".

Another example of a less dominant sub-concept would be sex. Sex became an issue of debate in MIL08, whereas it hardly was discussed in the other cycles, and I have thus decided to disregard this aspect, as well.

Selective coding (generating categories)

After organizing the data from the MIL08 case according to the concept coding, I decided to start the process of selective coding. During this process I investigated the MIL07/MIL08 data for categories related to the sub-concepts. As a way of organizing this process, I decided to use a mind-mapping tool[29]. This process resulted in three visual maps reflecting the core concepts, sub-concepts, and the categories. Based on the

[28] This aspect also points to SL's evolution. When SL became mainstream quite a number of RL businesses established in-world presence hoping to attract new customers, and this resulted in numerous commercials and marketing events that dominated some Islands. As the companies failed, this aspect almost disappeared, and in the MIL08-MIL10 cases we hardly noticed it.

[29] Mind Node: http://mindnode.com/

data from MIL09 and MIL10, I repeated the process and thus refined the categories by constant comparison of the data. Figures 3.2., 3.3. and 3.4. on the following pages show the final basic maps, where some of the category names clearly are theoretically inspired.

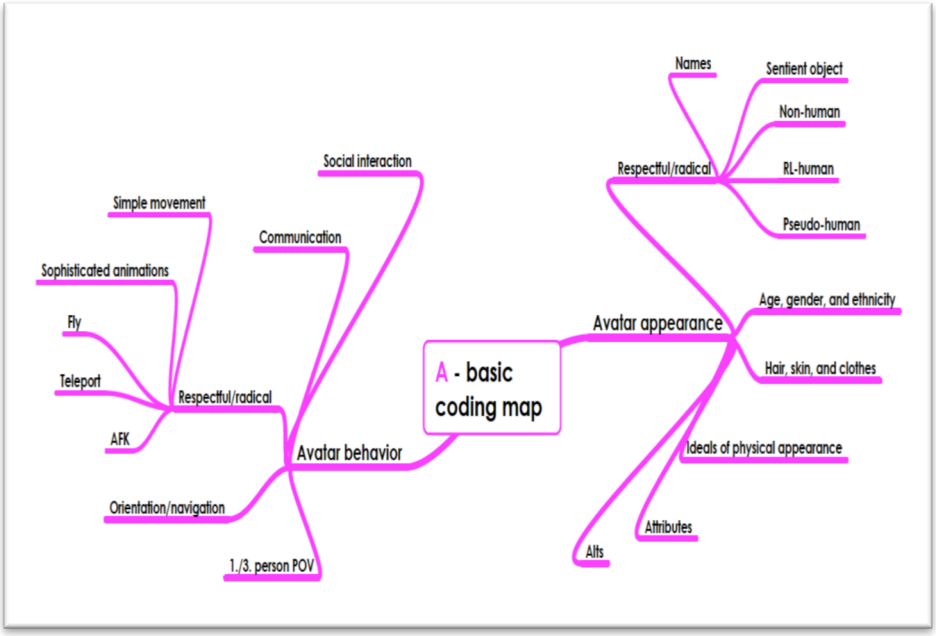

Figure 3. 2. Basic coding map A.

Basic coding map A shows categories identified in relation to the students' experiences of becoming avatars, and the categories are matched with the two sub-concepts (behaviour and appearance) generated from the first research cycle.

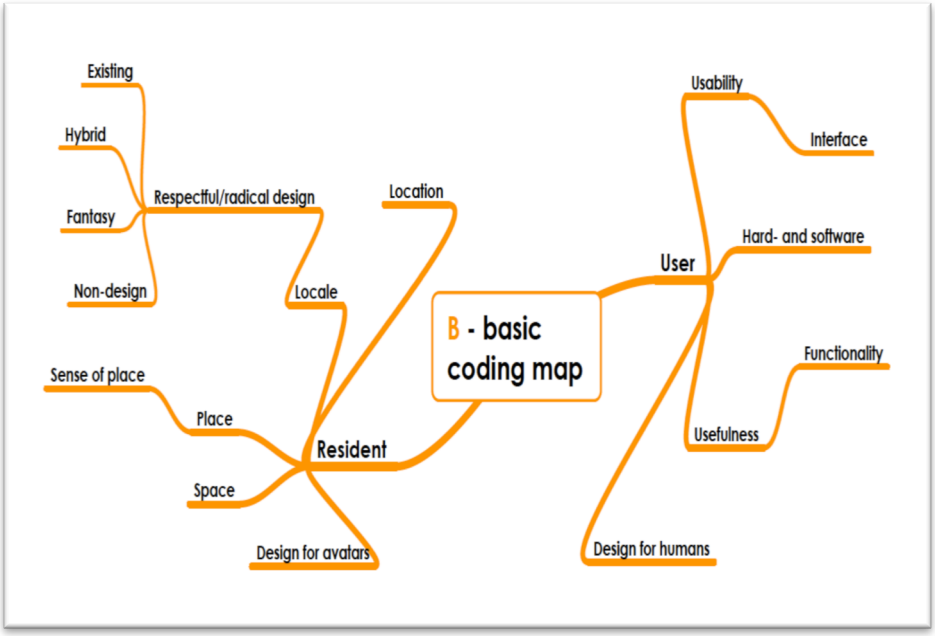

Figure 3.3 .Basic coding map B.

Basic coding map B shows categories identified in relation to the students' experiences with the environment, and the categories are matched with the two sub-concepts (resident and user) generated from the first research cycle.

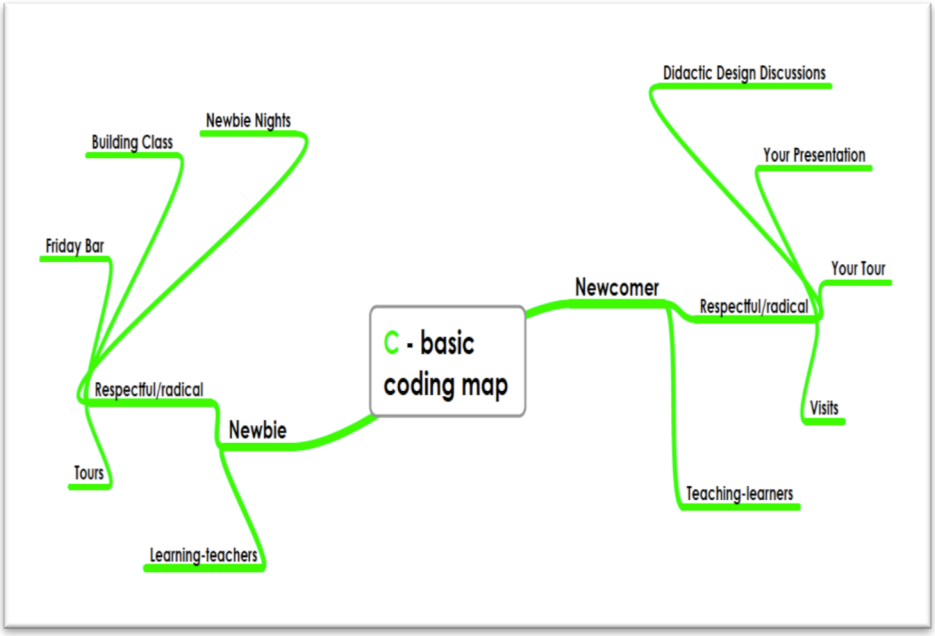

Figure 3.4. Basic Coding map C.

The conception of basic coding map c differs from the two previous maps insofar as it is based on a revision of the initial sub-concepts generated in the first research cycle. In order to tell the story of the students' experiences with participation and reification based on pedagogical activities in SL, I have found it fruitful to do so from the newbie and newcomer perspectives respectively.

Theoretical coding (generating and integrating theory)

The aim of the theoretical coding process in GT is to generate a theory based on the data (Charmaz, 2006), not based on theory (as the name would lead to believe). As I have explained earlier, my approach has not followed the principles of GT strictly, and this is the phase where my approach starts to differ considerably from traditional GT. Not least due to the duration and the context of my study (i.e. working in a research community), it would have been impossible and undesirable to shy away from theoretical inspiration throughout this elongated analytical process. From the onset of my official PhD-period I also became involved in another research project (the COMBLE project – cf. chapter one), and as part of my PhD obligations I started supervising and teaching both on- and off-campus students in subject areas very closely tied to the focus of my research. In essence, this led me to general literature concerning the avatar phenomenon and pedagogical practice in 3D virtual environments, which

undoubtedly shaped my theoretical sensitivity, and thus have influenced my choices in the subsequent research cycles.

Moreover, my project is based on a designed case, and even though I did not design the MIL cases explicitly based on a theoretical framework in order to test its application[30] (this I did in 2010), but tried to let the data guide the design, it would be naive to think that the design was not informed by theory as well. As explicated in chapter one, my pre-understanding is deeply influenced by the theoretical and pedagogical assumptions that permeate the general practice at MIL[31]. Thinking back, I remember feeling that my design choices were based primarily on intuition and grounded data in the MIL08-MIL09[32] cases – and they most likely were. Then again, intuition is based on lived experience and my participation in a community of practice for more than a decade, namely MIL, has clearly shaped my experience. When I started the process of writing this dissertation, I was worried that it would be difficult to justify my design decisions in MIL08-MIL09 theoretically. Because, even though received theory has a different role in GT, one of the challenges for AR projects, as I have stated earlier, is to both integrate and generate theory, and thus demonstrate that this type of research projects, is in fact research and not merely evaluation projects (cf. Reeves, 2000 criticism).

Nonetheless, while I did not deduct and use the whole body of design principles stemming from the theories[33] in the MIL08-MIL09 cases, the data shows that my decisions were in fact very aligned with the theoretical framework. When writing the dissertation, this has enabled me to explain my design choices theoretically, even though only some were explicit, others more tacit/intuitive at the time they actually were made. Moreover, as stated by Baskerville & Pries-Heje (1999) above, AR and GT projects are not fully compatible, and when and where in the research process the theory integration should be done, may well be the point where the two approaches differ the most. Besides the MIL10 case, which intentionally was designed based on communities of practice framework, this theoretical coding phase, was the first of the analytical phases, where I deliberately started using the theoretical framework as a lens through which I analysed and interpreted the data.

According to Baskerville & Pries-Heje (1999), one way of generating theory in this phase is to articulate the story the data tells in relation to so-called core categories.

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30 As mentioned, this is one of the main reasons that I do not label my study as a "Design-based Research" project. Further, a central argument of mine is that the communities of practice framework, as expressed by Wenger himself (1998) and later together with co-authors (Wenger, McDermott & Snyder, 2002; Wenger, White & Smith, 2009), is descriptive, rather that prescriptive.

31 Additionally, so are the students, and their pre-understandings of the theoretical framework also influence the data.

32 The MIL07 cased was based on an existing design, where I did not challenge or alter the design decisions from the beginning of the course. Seeing that the existing design failed during the course, I intervened, but there was not as many design decisions made by me as in the consecutive research cycles.

33 I highly recommend Coto (2010) for a very meticulous and admirable example of how this can be done.

Based on the concepts, sub-concepts, and categories generated in the previous phases, I decided to focus on two core categories or stories to tell corresponding to the study's research questions:

1. Student responses to the avatar phenomenon (linking A, AA, and AAA concepts and categories)
2. Student responses to the design (linking all B and C concepts and categories)

The stories of how the students responded to the design in the courses are mainly told in chapter five, where I present the four MIL cycles, the actions that I took, and how I interpreted the students' reactions to the design. In this respect, chapter five provides much of the answer to my research question (RQ2) regarding the design. The students' reactions to the design are, however, dependent on their reactions to the avatar phenomenon, given that it was through the avatar they experienced it all, and this story is told in chapter six, thus proving much of the answer to my first research question (RQ1).

3.5. ETHICS

According to Bryman (2012) social studies always involves reflection on ethical issues. The Steering committee behind MIL granted me permission to conduct the study, and I also asked the participants for informed consent. The courses, I have used as cases (cycles) in this study were optional to the students, and before the students made their choices, they were informed about the study. In connection to starting each course, I spoke with students about my research trying to make sure they understood the purpose, how and why I did the study, and what participation would mean to them and their education. From MIL08 cycle and onwards, I also showed the students examples of how I had generated data and how I intended to use the data. To ensure voluntary participation, I also made it clear that the students could enrol in the course even if they did not wish to participate in the study, and that it would be possible to withdraw from the study at any point in time. All enrolled students in the four courses (MIL07-MIL10) accepted to participate, and all students (with the exceptions mentioned in chapter one) were guaranteed anonymity. Seeing that the context of my study is educational with an inherently uneven power balance, I also tried to ensure the students that my role in the courses first and foremost would be as teacher by explaining the dual imperative of AR. Furthermore; I made a habit of discussing my pedagogical design reflections and decisions with the students as many of these were relevant to their study as well.

CHAPTER 4.
CONTEXT OF THE STUDY

In this chapter, I present the context of the study, and a conceptual design model. In the first section, I describe the Master programme on ICT and Learning (MIL) where one particular online course was used as case for this study. The section highlights central elements of the MIL programme such as its background, its pedagogical foundation, its structure, and a description of the course setting. The programme's technology adoption is discussed, and the students of the programme are profiled

In the second section, I present the development of a conceptual design model, and different sets of design principles based on central elements from situated learning, the communities of practice framework, and remediation theory. As already mentioned, even Glaser & Strauss (1967) acknowledge that as researchers we do not enter the field devoid of pre-understanding. Since I had been involved in the MIL programme for almost seven years prior to commencing my research, the theoretical backdrop underpinning MIL naturally influenced my entrance in and pre-understanding of this particular field. My initial research interest in this study was to understand the avatar phenomenon and not to study whether or not a particular theoretical framework could be a viable design strategy for avatar-mediated teaching and learning. The research interest in using elements from the mentioned theories emerged throughout the research cycles and was based specific findings in each cycle. The presentation of the conceptual design model and principles thus serve two purposes: 1) it enables me to present central theoretical elements important to the reader's understanding of the actions taken in the research cycles, and 2) the model provides a structure for the presentation of the findings in the research cycles (forthcoming chapter five).

4.1. EDUCATIONAL CONTEXT - THE MIL PROGRAMME

In this section, I describe the Master programme on ICT and Learning (MIL) where one particular online course was used as case for this study. The section provides information on the MIL programme's background, its pedagogical foundation, its structure, and a description of the course setting. The programme's technology adoption is discussed, and the students of the programme/case are profiled.

4.1.1. MIL – BACKGROUND

The MIL programme was created in 2000 by a steering committee consisting of researchers from five Danish Universities; Aalborg University, Aarhus University, Copenhagen Business School, The Danish School of Education, and Roskilde University. The members of the steering committee had been working together in a Danish research network on Learning and Multi-media since 1994, and based on their successful collaboration they decided to try to establish an online educational programme, and to date, this cross-institutional collaboration remains unique in the Danish educational system (Riis, 2009; Sorensen et al., 2006 & Fibiger et al., 2004). Though based on a formal cooperation between the five universities, the MIL programme is administratively and legally based at Aalborg University in the Department of Communication.

The cross-institutional organization also led to a cross-disciplinary approach towards the curriculum insofar as the members of the steering committee and the rest of the researchers/teachers represent five different departments each contributing with specific perspectives on the field of ICT and learning. The different research perspectives on the field of ICT and Learning are further enhanced by different pedagogical cultures in the five institutions. Roskilde University and Aalborg University are known as "new" universities with fairly open-ended curricula, both founded in the early 1970's in opposition to the more traditional universities. Evidently, finding common ground between different pedagogical cultures has been a challenge, but it has led to the development of a common pedagogical framework that seeks to put forward and combine the best principles from each tradition as well (Sorensen et al., 2006 & Dirckinck-Holmfeld, 2002a & 2002b).

4.1.2. MIL – PEDAGOGICAL FOUNDATION

The pedagogical foundation of the MIL programme has been thoroughly researched and described by several authors (e.g. Dirckinck-Holmfeld et al., 2009; Riis, 2007; Sorensen et al., 2006; Fibiger et al., 2004; Dirckinck-Holmfeld, 2002 & Sorensen, 2002). Of particular interest for this study are a few core principles guiding the pedagogical activities throughout the programme; problem orientation and project work, self-directed, but collaborative learning and the notion of creating knowledge through participation and negotiation meaning and identity. All educational programmes at Aalborg University are founded on a local variation of Problem Based Learning called the Aalborg PBL model (Kolmos, Fink & Krogh, 2004), which puts in forefront students' own responsibility of defining relevant practice-related problems implying a high degree of student control over both content and learning processes.

The combination of traditional Problem Based Learning (Kolmos et al., 2004) and project work (Illeris, 1974; 1981; 2001) based on social theories has led to the development of a pedagogical approach called Problem Oriented Problem Pedagogy

(POPP). According to Dirckinck-Holmfeld (2002b), the fundamental difference between traditional PBL and POPP lies in the starting point for the learning processes. In POPP, the starting point is directed by the students' interests, the students define and "own" the problem, which is in opposition to a more traditional teacher or textbook led PBL approach. The open-ended problem orientation ideally calls for an open-ended curriculum. In practice, the study activities at MIL oscillate between a more traditional PBL approach in the course modules and a POPP approach in the dedicated project periods, where the students work with truly self-defined problems.

At the MIL programme, arguments for collaborative work are based on a socio-cultural perspective on learning, with the ideas of Lave & Wenger (1991) and Wenger (1998) on situated learning, legitimate peripheral participation and communities of practice as main inspiration. Research has documented that this approach facilitates the creation of communities of practice at MIL (Sorensen, Tackle & Moser, 2006; Sorensen & Murchú, 2006; Sorensen & Tackle, 2005; Dirckinck-Holmfeld et al., 2004). Speaking of a socio-cultural perspective is actually somewhat disingenuous and should mainly be seen as a way of creating consistence. The theories attributed to this perspective stem from various contexts in both humanities, social science and natural science, and there exists no single, uniform theory of socio-cultural learning. The complexity of modern life calls for a need to draw on multiple disciplines when investigating phenomena such as human learning and development and according to Dyste (2001a), interdisciplinarity is the first characteristic of what she refers to as socio-cultural theories on learning.

Dysthe (2001b, p. 62-72) identifies five theoretical directions that encompass socio-cultural perspectives on learning:

1. Cultural psychology - represented by Jerome S. Bruner, Barbara Rogoff & Michael Cole
2. Activity Theory - represented by Alexander R. Luria, Aleksia N. Leontiev & Yrjö Engeström
3. Socio-cognitive theories - represented by neo-Piagetians, Peter L. Berger, Thomas Luckmann & Kenneth J. Gergen
4. Situated learning/Communities of practice – represented by Jean Lave & Etienne Wenger
5. Dialogism – represented by Ragner Rommetveit, James Wertsch & Michail M. Bachtin

A couple of important points are worth remarking concerning Dysthe's "classification". First of all, the influence from Lev S. Vygotsky and the Russian cultural-historical psychology combined with ideas from John Dewey and the American pragmatism is more or less dominant in all of these theoretical directions, and secondly several of the theorists mentioned above oscillate between the directions. Michael Cole for example labels himself "cultural psychologist" (Cole, 1996), but he has also worked extensively with Activity Theory together with Yrjö Engeström (e.g. Engeström & Cole, 1997).

Despite the simplification of the variety of the theories mentioned, the common ontology behind this type of theories is emphasised by using the prefixes socio and cultural; humans are social beings who relate to and engage in interaction with other humans anchored in a cultural-historical context. This fundamental ontological belief naturally affects the epistemological assumptions underlying these theories:

> Socio-cultural perspectives build upon a constructivist view of learning, but put crucial emphasis on the fact that knowledge is constructed through interaction and in a context, and not primarily through individual processes. (Dysthe, 2001a, p. 48 – my translation)

Notwithstanding the fact that no single socio-cultural theory exists, a range of characteristics common to these theories in relation to learning can be identified, as shown in table 4.1.below.

General characteristics of learning in a socio-cultural perspective	
Learning is constructed	A socio-cultural perspective on learning builds on constructivist theories wherein learning is seen as a process of knowledge construction as opposed to a process of knowledge transfer.
Learning is social	A socio-cultural perspective on learning emphasises learning as a social process where knowledge first is constructed socially and then internalized.
Learning is situated	A socio-cultural perspective on learning focuses not only on the participants, but on the context (time, space, situation, culture) in which they interact as well
Learning is mediated	A socio-cultural perspective on learning focuses on the tools participants use for their interaction, and language is considered the most important tool.
Learning is distributed	A socio-cultural perspective on learning sees knowledge not only as something that is located in the individuals, but also in between participants and artefacts.
Learning is coming to be	In a socio-cultural perspective, learning is seen as more than mere epistemic construction. Learning is a process of becoming, of forging identities in activities in the world.

Table 4.1. Learning in a socio-cultural perspective (modified after Riis, 2002)

Depending on which theory one chooses to work with within this perspective, focus on the above mentioned characteristics would vary. The theorists' preconceptions are influenced by their underlying philosophical assumptions (theory), and their academic affiliation within different fields of study (practice). An important note should be made concerning the relationship between constructivism and socio-cultural theories. While both move beyond the metaphor of learning as transfer, constructivism refers to learning as acquisition, whereas especially theories building on the notion of situated learning (Lave & Wenger, 1991; Wenger, 1998) are based on a participation and reification[34] metaphor.

According to Packer & Goicoechea (2000), this dissimilarity stems from different ontological assumptions, and the authors posit that constructivism is founded on a dualist view, whereas socio-cultural theories are founded on a non-dualist, dialectical view. The difference has significant consequences. The constructivist perspective tells us what happens if we act as mind independent from world, where a socio-cultural perspective focuses on the interdependence between the world and us. Then again, one perspective does not rule out the other, because:

> The mental processes and schemata of cognitive activity that constructivism emphasizes are formed in and through participation in specific social practices, culturally and historically situated. (Packer & Goicoechea, 2000, p. 234)

Learning then, becomes a complex reconstruction of both the subject and the world, as highlighted by Packer together with Lave:

> Learning, in the conceptualization that is made possible by notion of the constitutive every day, is no longer viewed simply as a change in an autonomous subject's knowledge of an objective world. Learning is construed as the reconstruction of the way a subject is engaged in the world, so that the subject herself or himself is reconfigured, and at the same time there is a reconfiguration of the production and reproduction of objects, whether they be texts, other persons, social events, or institutions. (Lave & Packer, 2008, p.43)

Constructivism and socio-cultural theories thus provide different, yet compatible perspectives on learning with the latter applying a broader, more inclusive view as Packer & Goicoechea so powerfully conclude:

[34] The metaphor related to Situated Learning and learning in Communities of Practice is often described as "participation" only (e.g. Paavola & Hakkarainen, 2005). I regard this as a misinterpretation of Lave & Wenger's ideas, and my claim is that if "reification" is left out, an important part of learning is lost.

> What constructivists call learning is only part of a larger process of human change and transformation, the process called learning by socioculturalists. Whether one attaches the label "learning" to the part or to the whole, acquiring knowledge and expertise always entails participation in relationship and community and transformation both of the person and the social world. (Packer & Goicoechea, 2000, p. 239)

In summing up the pedagogical foundation of the MIL programme, I will argue that it is based on a combination of socio-cultural characteristics applied in an overall POPP setting. Depending on particular programme activities (course or project modules), and on the specific teachers/researchers involved in such activities, different characteristics will dominate, thus reflecting the cross-institutional organization, and the cross-disciplinary approach towards the curriculum.

4.1.3. MIL – PROGRAMME STRUCTURE AND COURSE SETTING

From its initiation in 2000 until summer 2010, the MIL programme had the same curriculum, and the overall structure is shown in figure 4.1. next page. MIL is a two-year, half time study programme based on a student workload equivalent to 60 ECTS credits. In this version of the curriculum, there was a distinction between Course Modules (module 1-4, and ICT-tools) and Project Modules. The fourth course module "ICT and Educational Design" is where the course used in this case study was situated. This module consisted of two courses;

1. **Educational design, ICT based learning products and virtual learning environments; theory and analysis**, and
2. Educational design, ICT based learning products and virtual learning environments; concept and implementation (MIL studieordning, 2007).

It was the first course that was used for this study, and the expected workload for the students was 110 hours throughout the course.

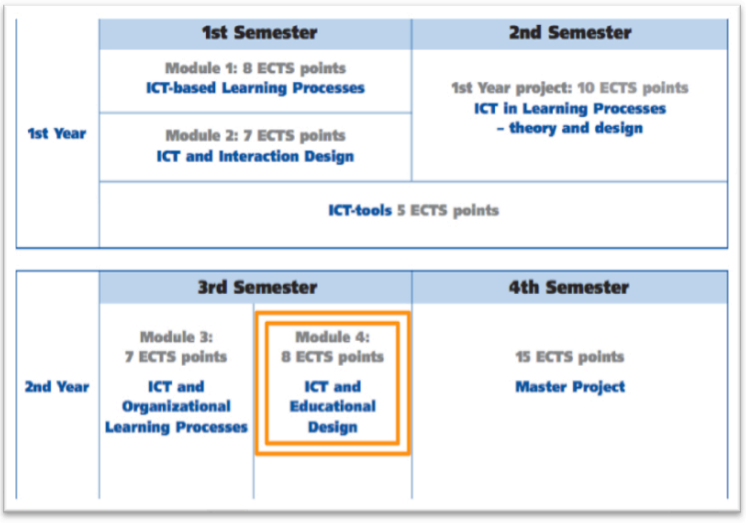

Figure 4.1. Structure of the MIL programme until summer 2010.

Though separate, the two courses should be regarded as connected, in the sense that the learning outcome of the first course to some extent was expected to be applied in the second course. The purpose of the first course was to introduce to the discipline Didactic Design, and to define central concepts within the field of Didactics. The expected outcome was that the students would gain a theoretical and analytical understanding of how didactic theory and didactic elements could influence different types of teaching and learning processes. In the first course, the students were usually provided with two optional technologies between which they were asked to choose one as analytical object. Between 2007-2009, SL was one of the options in this course, whereas the other option was a serious game called Global Conflicts Palestine. Throughout the MIL programme, the students are introduced to different technologies covering a wide range of mainly conventional 2D asynchronous and synchronous examples. The technologies chosen for this course always represented the more unconventional (in an educational setting) trends, since it has been our experience that these often provide rich and radical settings, which can stimulate nuanced reflections.

Regardless of choice, the students were expected to conduct a so-called Didactic Analysis of the chosen analytical object. In the German Didaktik tradition, Wolfgang Klafki developed Didaktische Analyse [Didactic Analysis] as "a reflective method for preparation of instruction"[35] in 1958 (Klafki, 2000), and the method, based on five core questions, has since become one of the most widely known and used methods within classical Didaktik studies (Hopmann, 2000).

[35] Quoted in Klafki, 2000, footnote 1: Didaktische Analyse als Kern der Unterrichtsvorbereitung. *Die Deutsche Schule* (1958), pp. 450-471.

At the MIL programme, we have abandoned Klafki's original questions, and let our students formulate relevant didactic questions (based on theory and practice) on their own. Nevertheless, the core of the Didactic Analysis that the MIL students are expected to conduct, still constitutes a critical and reflective approach to didactic theory and pedagogic-didactic elements that are presumed to influence planning, implementation, and evaluation of teaching and learning. In the 2007-2009 courses, five central discussion themes were identified to ensure that the students' work would cover the curricular intentions, which I will return to when presenting the research cycles. In 2010, the revision of the curriculum resulted in the following structure:

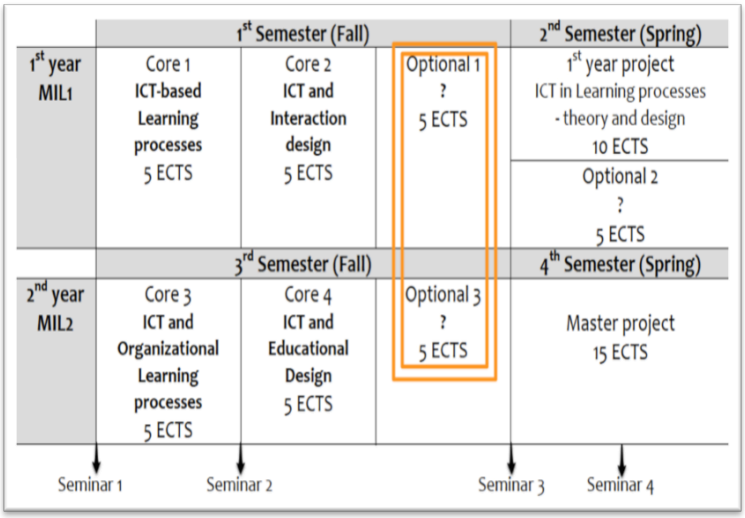

Figure 4.2. Structure of the MIL programme as of fall 2010.

In this new version of the curriculum, the modules are designed so that each module can be divided with 5 ECTS, making it easier for students to transfer between study programmes, and there is a distinction between Core Modules, Optional Modules, and Project Modules (MIL studieordning, 2010). The "ICT-tools" module was dissolved and integrated into existing modules, and the creation of Optional Modules (based on a generic "ICT and Learning" content) has made it possible to design and implement modules better covering the latest developments within the field, especially with regard to emerging technologies. In all Optional Modules, the student workload is set to 137, 5 hours. Since 2010, an optional module based on SL has been offered. The change in curriculum influenced the design and the outcome of the fourth research cycle, conducted in 2010, in several ways, and therefore this change is something I will return to.

4.1.4. MIL – GENERAL STUDENT PROFILE

Documented information about the general profile of MIL students is limited. An internal investigation, based on desktop research conducted in 2004, showed that a typical MIL student was in his/her forties, and married with two children in the teens (Sorensen et al., 2006). For most of the students their primary education was more than ten years old, which often meant that many of them had no or little experience with distance learning. Furthermore, the investigation also showed that the PBL/POPP concept was new to the majority of the students. All of them were relatively competent regarding general ICT-skills, and nearly 20% were very competent technicians. About 5% of the latter had never been professionally engaged in teaching and learning (Sorensen et al., 2006, p.4).

In 2007, the MIL program conducted a survey among MIL alumni as part of the programme's accreditation process (MIL Akkrediteringsrapport, 2010). Seventy-eight Masters responded, and based on this data it is possible to give a tentative profile the MIL students in relation to work, educational background, and motivation for entering the program. The study showed that 74% were employed in the public sector, 19% in the private sector, 4% were self-employed, and finally 3% were unemployed. In terms of educational background, 39,1% had completed a Bachelor degree, whereas 35,4% already had a Master's degree before entering the programme. The remaining 25,3% listed other types of education (e.g. Teacher Education). As for motivation, none of the Masters listed a demand from their employer as sole reason, 56% of the Masters marked their motivation as being personal, 38% listed a combination of personal and employer based demands, and finally 6% listed other reasons for entering the programme (MIL Akkrediteringsrapport, 2010, pp. 34-37).

In this study, I did not investigate the students' backgrounds in detail, but despite the data mentioned above is somewhat dated, my impression was that the students participating in the four research cycles fit the general profile. My main concern was whether the students had any prior experience with virtual worlds/games, which will be described in relation to each of the research cycles.

4.1.5. MIL – TECHNOLOGY ADOPTION

As a distance education programme MIL has since the beginning in 2000, deployed different technologies that can be divided into two main areas of use: a) core technology framing the ICT infrastructure of the study programme, and b) technologies used as analytical objects. In line with the general technological development, MIL's use of technology has changed over the years (Riis, 2009), and these changes have also been affected by the revision of the programme's curriculum in 2010 as described above. In terms of technology deployment and its influence on the teaching and learning activities, it is possible to talk about three phases in MIL's history.

1. Phase (2000-2005)

From 2000-2005, the core technology at MIL was a virtual learning environment called, Virtual-U. This environment was characterized by a very strong focus on asynchronous communication, which also has been the predominant delivery mode of the programme's teaching and learning activities since the beginning. As new, synchronous technologies (such as Skype and Windows Live Messenger) started to hit the market36, especially the students slowly started to use these in their study work and project management. Among the MIL teachers, experiments with new synchronous technologies were conducted, but mainly as analytical objects.

Outside MIL, this is the period when the Web 2.0 phenomenon starts appearing. According to boyd & Ellison (2007), Social Networking Sites (SNSs) started to hit mainstream in 2003, this however, mainly refers to North America, and the now most used SNS in the Western world, Facebook was still restricted to certain users.

2. Phase (2006-2009)

In 2006, the MIL programme decided to change the main virtual learning environment, and started using FirstClass (FC) as core technology. FC offers different features than Virtual-U, but the main delivery mode of the teaching activities was still based on asynchronous communication. The use of new, synchronous technologies at MIL were still mainly as analytical objects, but in relation to supervision of the students (in the project periods) it became common to offer synchronous meetings via VoIP telephony (such as Skype), or via desktop computer conference systems (such as Adobe Connect).

In this period, the technological development outside MIL started to permeate the habits and general practices of the students, and in line with the general Danish population, MIL students became used to using Web 2.0 technologies, incl. SNSs. In January 2008, Danish SNS-researcher, Marlene Charlotte Larsen argued that Facebook was starting to become mainstream in the Danish population (Larsen, 2008). In the spring of 2008, two MIL alumni created MIL related groups in Facebook, and these groups slowly replaced the previous use of FC for extra-curricular activities.

3. Phase (2010 –)

As mentioned in the previous section, in 2010, the MIL programme revised its curriculum, and one of the consequences was that the use of technology became more integrated in the various teaching and learning activities. To date, the main delivery mode is still based on asynchronous communication, and the core ICT infrastructure has changed to Moodle. Furthermore, all modules are now supplementing the Moodle environment with other technologies, and especially in the Optional modules, more

[36] Skype was introduced on the market in 2003, whereas Messenger was introduced in 2005.

synchronous technologies are used. According to Statistics Denmark's 2010 report on Internet Usage, 54% of the population between 16-74 were using SNSs, with a 94% preference for Facebook (Danmarks Statistik, 2011). In 2010, MIL also became officially represented on Facebook, and in 2011 on LinkdIn.

In relation to technology appropriation and integration, two important points relevant to this study should be noted. First, the predominant delivery mode for the teaching and learning activities at MIL is asynchronous, and besides the learning potential believed to be connected with this mode (i.e. amplified critical reflection as described in Sorensen, 2004), another important argument for maintaining this communication strategy is to ensure flexibility. Given that the majority of the MIL students are fulltime employed, a high degree of flexibility in terms of time and space for the study activities is necessary to ensure programme completion. Consequently, as SL mainly is a synchronous medium, this circumstance obviously posed a design challenge in this study. Secondly, I will argue that the general acceptance of SNSs, such as Facebook with a dominant focus on online identity, has had a positive influence on the MIL students' perception and appropriation of SL over the years covered in this study. As such, I have noticed a shift in the students' initial perceptions of identity-focused media from 2007 to 2011, and this I believe has to do with a change in the general ICT skills and online habits of the students.

4.2. DEVELOPMENT OF A CONCEPTUAL DESIGN MODEL

In this section, I describe the development of a conceptual design model. It should be noted that this model emerged throughout the research cycles based on the different findings. Only in the last research cycle, did I use the complete model to guide the design. I also present different sets of design principles that guided the design process from the second research cycle and forward. The design model and the principles are based predominantly on the communities of practice framework, and thus also provide an opportunity to present important theoretical aspects significant to the reader's understanding of the actions taken in the research cycles.

4.2.1. LEARNING IN COMMUNITIES OF PRACTICE

According to Ito et al. (2009) the theory of situated learning and communities of practice is part of a "social turn" emerging in the 1980's within different academic fields such as literacy studies, new media studies, and learning theory. The social turn represents a relatively new set of paradigms for understanding learning and literacy that emphasize the importance of social participation and cultural identity. Moreover, this line of thinking moved away from the previously dominant focus on individual

cognition and knowledge acquisition. Lave & Wenger (1991) originally developed the notion of communities of practice out of an empirical interest in situated learning in apprenticeship as an alternative to American school-based learning. Lave & Wenger (1991) drew on five studies of apprenticeship in western and non-western societies[37]. While these empirical choices to a large extend shape their further theorizing about knowledge creation and learning, it is important to notice that the theoretical framework has evolved in seemingly subtle, but important ways. Whereas the notion of learning in 1991 appeared to be almost exclusively linked to participation, Wenger (1998), in my opinion, places an equal emphasis on reification as an essential part of the learning experience.

Another interesting evolvement of the theory has to do with the role of the individual learner, where both Wenger (1998) and Lave (1999) stress the importance of identity formation through personal learning trajectories. Both the notion of reification and the focus on individual learning are examples of theoretical developments that has made it easier to utilize the framework in institutionalized school-based settings, such as in this study. Although I will return to some of the theoretical developments, in what follows I have chosen a highly selective approach pinpointing primarily theoretical ideas and elements necessary to explaining my specific conceptual design, rather than a complete presentation of the framework. This also means that I will be drawing on the literature based on appropriateness, sometimes disregarding the chronological evolvement of the theory.

Lave & Wenger (1991, p. 31) characterize learning as "legitimate peripheral participation in communities of practice". The notion of legitimate peripheral participation is used to explain how learning presupposes accepted participation in a community, and that acceptable participation need not be that of an experienced old-timer, but also can be that of an inexperienced newcomer learning in the periphery of the practice. In this line of thinking, participation is seen as both the context in which learning occurs and as an important part of the content of the practice. Wenger (1998) defines a community of practice along three dimensions as depicted in figure 4.3. next page.

[37] Vai and Golan Tailors in Liberia, Mayan Midwives in the Yucatan, US navy quartermasters, non-drinking alcoholics, and US supermarket meat cutters.

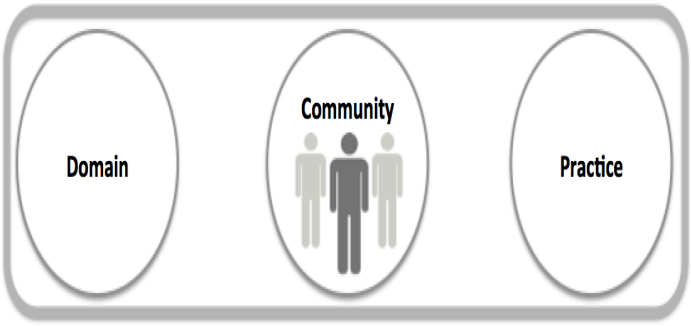

Figure 4.3. The three dimensions of a community of practice.

These dimensions are:

1. **A domain** of knowledge that creates a common ground and sense of common identity.
2. **A community** of people who are engaged in the domain and create the social structure that facilitates learning.
3. **A practice** that the community shares, develops, and maintains to be effective in its domain.

Different theories of learning address different aspects of learning, and while Wenger (1998) does not see his theory as a replacement for other theories, he emphasises that his primary focus is on learning as social participation:

> Participation here refers not just to local events of engagement in certain activities with certain people, but to a more encompassing process of being active participants in the *practices* of social communities and construction of *identities* in relation to these communities. (Wenger, 1998, p. 4 – original emphasis)

Important in the context of this study is the fact that, in Wenger's perspective participation not only shape what we do (our practice), but also who we are (our identities), meaning that learning is not seen just as an accumulation of knowledge, but rather as identity formation. Based on these fundamental assumptions, Wenger puts forward four central ways of learning in a community of practice:

1. **Learning as doing**, related to practice, is identified as "a way of talking about the shared historical and social resources, frameworks, and perspectives that can sustain mutual engagement".

2. **Learning as belonging**, related to community, is identified as "a way of talking about the social configurations in which our enterprises are defined as worth pursuing and our participation is recognizable as competence".
3. **Learning as becoming**, related to identity, is identified as "a way of talking about how learning changes who we are and creates personal histories in the context of our communities".
4. **Learning as experience**, related to meaning, is identified as "a way of talking about our (changing) ability – individually and collectively – to experience our life and our world as meaningful". (Wenger, 1998, p. 5)

A key point in Wenger's theory is that learning is an on-going and dynamic process, and this also translates to Wenger's way of using active instead of passive verbs[38] when describing learning. Based on these initial theoretical elements of the framework, it is possible to illustrate the central components of learning in a community of practice as in figure 4.4. below.

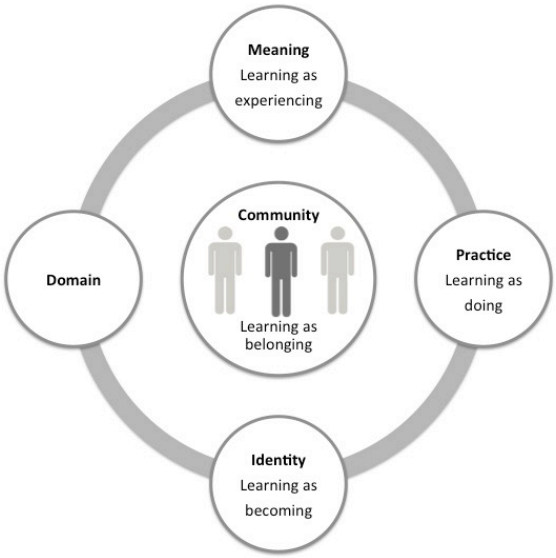

Figure 4.4. Central components of learning in a community of practice.

[38] There is, however a small inconsistency in relation to experience, which Wenger in his model (1998, p.5) describes in passive voice. Wenger acknowledges the inconsistency and points to the "awkwardness" of using experience without an object (which otherwise is common when using active voice). It should be noted that experience is the only component of the four that also can be described as a homonymous noun, and this could explain why active voice in relation to experience seems more awkward than in relation to the other components. The important point here is that while use of passive voice may seem linguistically more natural when describing experience, it does not imply a view of experience as a static product only (Wenger, 2012 – personal communication).

In viewing the central components of learning in a community of practice it should be noted that these are highly interconnected and mutually defining (Wenger, 1998, p. 5), which means that changes in one of the components would influence the others. So far, the development of a conceptual design model takes its point of origin in learning, which is in full accordance with Wenger, who states that his theory is a social theory of learning (Wenger, 1998, p. 3). While learning is quintessential in any institutionalized pedagogic endeavour, my interest in this study is equally concerned with teaching. Again, it is important to remember that Lave & Wenger (1991) originally developed this theoretical framework as an alternative to school-based learning:

> We should emphasize, therefore, that legitimate peripheral participation is not itself an educational form, much less a pedagogical strategy or teaching technique. It is an analytical viewpoint on learning, a way of understanding learning. (...) Indeed, this viewpoint makes a fundamental distinction between learning and institutional instruction. (Lave & Wenger, 1991, p. 40)

Such a statement may seem disconcerting for an educator wishing to use the framework, and the authors are aware of this as they go on to hoping that this particular perspective on learning will "(...) inform educational endeavours by shedding a new light on learning processes, and by drawing attention to key aspects of learning experience that may be overlooked" (Lave & Wenger, 1991, p. 41). Thus, Lave & Wenger (1991) do not rule out that the concept on communities of practice can be useful in institutionalized settings, but they maintain that there is no prescriptive value attributed to the concept and no proposal of ways of implementing or operationalizing it for educational purposes.

It should be noted though, that at this point in time the authors describe their work as being at an initial stage, and in 1998 Wenger devotes three chapters to design for learning targeted at organizations and educational institutions, which enables us to take a closer look at the teaching aspect in terms of design for learning.

4.2.2. DESIGNING FOR LEARNING IN COMMUNITIES OF PRACTICE

Essentially teaching is about creating or rather designing opportunities for people to learn something (the domain), and in Wenger's 1998 theory, he proposes a so-called learning architecture based on four design dimensions and accompanying principles, as summarized in table 4.2. next page.

Communities of Practice design dimensions and principles	
Design dimension	**Design principle**
1. Participation and reification	Design for practice is always distributed between participation and reification - and its realization depends on how these two sides fit together.
2. The design and the emergent	There is an inherent uncertainty between design and its realization in practice, since practice is not a result of design, but rather a response to it.
3. The local and the global	No community can fully design the learning of another. No community can fully design its own learning.
4. Identification and negotiability	Design creates fields of identification and negotiability that orient the practices and identities of those involved to various forms of participation and non-participation.

Table 4.2. Design dimensions and design principles. (Based on Wenger, 1998, p. 231-235)

Even though, or perhaps because I consider myself an experienced teacher, I found these design dimensions and principles quite difficult to operationalize in my own teaching practice in this study. As a teacher, I have been used to work on the basis of more descriptive principles and models, and so in further developing my own conceptual design model, I relied on my prior experience from the field of Didactics. Well aware that Wenger and Lave (1998; 1991) set out to propose an alternative to "schooling" and institutionalized instruction (didactics), I decided to try to stay as faithful as possible to the original framework by means of using Ernest's (1995) four levels of an educational paradigm[39] in order to determine the fundamentals of the communities of practice framework. Ernest (1995, pp. 465-466) identifies the following four levels:

1. **Ontology** - a theory of existence concerning the status of the world and what populates it
2. **Epistemology** - a) a theory of the nature, genesis, and warranting of subjective knowledge, including a theory of individual learning, and b) a theory of the nature, genesis, and warranting of knowledge (understood as conventional or shared human knowledge), as well as a theory of the truth
3. **Methodology** - a theory of which methods and techniques are appropriate and valid to use to generate and justify knowledge, given the epistemology
4. **Pedagogy** - a theory of teaching - the means to facilitate learning according to the epistemology

[39] As we witnessed earlier in this chapter, situated learning and the theory of communities of practice can be regarded as a paradigm - cf. Isto et al. (2009).

As Ernest notes, adding pedagogy to traditional science theoretical concepts may be considered problematic because pedagogy is "inescapably, if tacitly, value laden" and there is the possibility of "overlap between methodology and pedagogy" in some paradigms (Ernest, 1995, p. 466). I do, however, agree with Ernest that when looking at educational paradigms it makes sense to include pedagogy, even though there clearly is an overlap between methodology and pedagogy in the communities of practice framework. In fact, I consider this to be strength and a matter of consistency, rather than a problem.

While Wenger (1998) does not describe his theory in traditional science theoretical terms, he does list four premises for his theory:

1. We are social beings. Far from being trivially true, this fact is a central aspect of learning
2. Knowledge is a matter of competence with respect to valued enterprises - such as singing in tune, discovering scientific facts, fixing machines, writing poetry, being convivial, growing up as a boy and so forth
3. Knowing is a matter of participating in the pursuit if such enterprises, that is, of active engagement in the world
4. Meaning - our ability to experience the world and our engagement with it as meaningful - is ultimately what learning is to produce (Wenger, 1998, p. 4).

When studying these premises, I do believe that it is possible to identify aspects all four of Ernest's levels. At the ontological level we learn, that we are social beings, and as Wenger (1998) states, this is not a trivial fact - not least compared to other paradigms. In terms of epistemology we learn that the nature, genesis, and warranting of both individual and shared knowledge stems from participation and engagement with the world. The methods and techniques related to generate and justify knowledge are also closely tied to participation insofar as knowing is a matter of meaningful experience and engagement. From this it is also possible to conclude that at the pedagogical level we must prioritize the learners' participation in meaningful activities. Based on this, I decided to identify core questions that would be posed at the epistemological level in a communities of practice framework and to try to translate these into more operational pedagogical questions that could specify pedagogical categories as shown in table 4.3. next page.

Overview of core questions and categories		
Communities of practice core questions	**Pedagogical core questions**	**Pedagogical categories**
What is the community practice about?	What is the teaching and learning about and why (purpose)?	Pedagogic domain
When is the community gathered and what is the physical community setting?	When does the teaching and learning process run? Where are participants situated in physical space?	Time and space
Who are the community members?	Who are the participants?	Participants
In what virtual environment do the community members unfold their practice?	In what virtual environment does the teaching and learning take place?	Virtual learning environment
What activities support members' learning through doing, experiencing, becoming, and belonging?	What are the teaching and learning activities that support the purpose and learning goals?	Learning activities
What are the members' experiences of learning through doing, experiencing, becoming, and belonging?	What are the teaching and learning experiences?	Learning experiences
What are the outcomes of the members' learning through doing, experiencing, becoming, and belonging?	What are the teaching and learning outcomes?	Learning outcome

Table 4.3. Overview of core questions and categories.

In the field of Didactics, pedagogic categories are used to plan and later analyse pedagogic design as a way of operationalizing theory. Since this framework is based on a theory of learning, I have decided to name the categories, and thus direct the attention towards learning[40], except in terms of the domain.

[40] Readers familiar with Hiim & Hippe's (1998) so-called "Didatic Relation Model", may recognize some of the pedagogic categories. The work of Hiim and Hippe also falls into the category of learning theoretical didactics (as stated in Keiding, 2013), and they too stress the interconnectedness and mutually interdependence between the elements, thus, in my opinion, making it a didactic model compatible with Wenger's ideas.

As Wenger states, participation in communities of practice does always result in learning, but this may not be apparent or even the purpose for joining the community (Wenger, 1998). In institutionalized communities of practice, such as the university setting in this study, the character of the community shifts from being voluntary to intentional, and the participants join in order to learn something specific in terms of the curriculum and subject matter. Further, in this study I focus on learning in a virtual environment, and I have therefore chosen to split the community setting into two separate categories; one concerned with temporality and the physical environment, and one concerned with the virtual learning environment.

I did not include the pedagogic categories directly in my conceptual design model, but used them as guidelines in terms of planning and later analysis. Whereas, I found Wenger's aforementioned design dimensions and principles difficult to use, Wenger with colleagues later developed principles for cultivating communities of practice, which I did find very useful.

4.2.3. CULTIVATING COMMUNITIES OF PRACTICE

As Wenger pointed out in one of the principles above, there is "an inherent uncertainty between design and its realization" (Wenger, 1998, p. 233), because practice is a response to design, rather than a result. In fact, according to Chotto (2010, p. 51) "there is an on-going debate among researchers on whether a community of practice can or cannot be designed". In this respect, it is important to notice the crucial difference between "design …" and "design for…".

> *Learning cannot be designed*: it can only be designed *for* – that is, facilitated or frustrated. (Wenger, 1998, p. 229 - original emphasis)

Another possible explanation for the disagreement among researchers may stem from the emphasis Wenger and colleagues originally put on the voluntariness of participating in communities of practice (Wenger, McDermott & Snyder, 2002), because neither organizations, nor educational institutions signal voluntary participation. However, here it becomes important to follow the line of arguments, Wenger, McDermott & Snyder put forward in terms of aliveness as the motivating factor for participating in any kind of community of practice:

> Because communities of practice are voluntary, what makes them successful over time is their ability to generate enough excitement, relevance, and value to attract and engage members. Although many factors, such as management support or an urgent problem can inspire a community, nothing can substitute for this sense of aliveness. (Wenger, McDermott & Snyder, 2002, p. 50 – original emphasis)

Consequently, the question becomes how we can design for aliveness:

> Certainly you cannot contrive or dictate it. You cannot design it in the traditional sense of specifying a structure or a process and then implementing it. (Wenger, McDermott & Snyder, 2002, p. 50)

Still, the authors stress, that aliveness does not always happen automatically - neither in natural, nor in intentional communities. Regardless of constitution, communities need to invite the interaction that makes them alive, and this can, if fact, be facilitated by design:

> Even though communities are voluntary and organic, good community design can invite, even evoke, aliveness. (Wenger, McDermott & Snyder, 2002, p. 50)

For communities of practice to thrive then, organic growth and aliveness become paramount design goals, and based on their experiences, Wenger, McDermott & Snyder (2002) present seven design principles for cultivating communities of practice. Table 4.4. next page provides an overview of the principles and their key components. These design principles are targeted any kind of community of practice, whether it be voluntary or intentional, co-located or virtual. However, when designing for virtual communities of practice other aspects may come in to play. In the continuing development of the community of practice framework, and following the general socio-technical changes, Wenger started focusing on what happens when a community becomes virtual. In the book "Digital Habitats - stewarding technology for communities", Wenger, White & Smith (2009) developed a framework for thinking about technology as an integral component of the life of communities of practice. Further, they proposed the role of a "technology steward":

> Technology stewards are people with enough experience of the workings of a community to understand its technology needs, and enough experience with or interest in technology to take leadership in addressing those needs (Wenger, White & Smith, 2009, p. 25).

Design principles for cultivating Communities of Practice	
Principle	Components
1. Design for evolution	Communities usually develop from pre-existing personal networks, and the dynamic nature of communities is essential to their evolution. Design elements should be catalysts for a community's natural evolution. "Alive" communities reflect on and redesign continuously, therefore community design often involves fewer elements to start off, than traditional organizational design. Social and organizational structures can facilitate the evolution of a community.
2. Open a dialogue between inside and outside perspectives	Good community design requires an insider's understanding of the community's potential to develop and steward knowledge. However, bringing an outsider into a dialogue with the community can allow insiders to see new possibilities.
3. Invite different levels of participation	People participate in communities for different reasons and expecting all community members to have the same level of participation is unrealistic. Three levels of participation will usually differ between a core group, an active group, and peripheral group who rarely participate. Members can move between these various levels. The key to good community participation and a vigorous degree of movement between levels is to design community activities that allow participants at all levels to feel like full members.
4. Develop both public and private community spaces	Dynamic communities are rich with connections that occur in both public and private parts of the community. Communities are much more that scheduled events. The key to designing community space is to orchestrate both public and private activities, and to facilitate formal as well as informal meetings.
5. Focus on value	Communities thrive because they deliver value. Frequently, early value mostly comes from focusing on the current problems and needs of community members. Moreover, value evolves with the community and need not be fully determined in advance. A key element in designing for value is to encourage community members to be explicit about the value of the community throughout its lifetime.
6. Combine familiarity and excitement	Lively communities combine both familiar and exciting so members can develop the relationships they need to be well connected as well as generate the excitement they need to be fully engaged and challenged. The key element is finding a balance between routine and adventure.

Continues next page ...

7. Create a rhythm for the community	There are many rhythms in a community: the syncopation of familiar and exciting events, the frequency of private interactions, the ebb and flow of people from the side-lines into active participation, and the pace of the community's overall evolution. There is no right beat for all communities, but finding the right rhythm at each stage is key to a community's development.

Table 4.4. Design principles for cultivating communities of practice. (Wenger, McDermott & Snyder, 2002, pp. 51-63)

Wenger, White & Smith also identify some of the challenges communities of practice may experience in a digital or virtual environment, and they describe these challenges in terms of polarities (2009, p. 56-59):

- **Rhythm** - which entails the relationship between togetherness and separation.
- **Interaction** - which entails the relationship between participation and reification.
- **Identities** - which entails the relationship between individual and group.

While the polarities are not design principles as such, I have used them in my analysis as a way of determining whether the community was thriving and alive. The work of Wenger, White & Smith is very useful on a pragmatic level. However, in terms of studying what actually happens in the relationship between the participants and the technology, I felt the need to further scrutinise one of the characteristics of socio-cultural learning, namely that of learning being mediated by artefacts (such as language and technical tools). Wenger does speak of artefacts, but the concept of mediation is not at the fore of his thinking. Therefore, I decided to study mediation as it has been conceptualised by other socio-cultural theorists, and combine this with findings from media studies, which eventually contributed to the overall design strategy in the research cycles.

4.2.4. REMEDIATION AS OVERALL DESIGN STRATEGY

Inspired by early last century cultural-historical psychology, Kaptelinin & Nardi (2006) state that all human activity is object-oriented and mediated. Human activities are directed towards something in the world, and a way of understanding these objects of activities is to look at them as "objectives, that give meaning to what people do" (Kaptelinin & Nardi, 2006, p. 66 - original italics). When looking at the subject-object relationship a direct reaction is often presupposed as expressed in the S → R formula, implying a direct causal link.

However, according to Vygotsky (1978) an intermediate link needs to be drawn into this operation when humans engage in higher psychological processes such as learning.

This means that the stimulus-response is replaced by a much more complex mediated act in which the direct impulse to react is inhibited by means of integrating an auxiliary stimulus (Vygotsky, 1978, p. 40) in the shape of signs or tools.

Both psychological signs and technical tools possess the ability to alter the flow and determine the structure of the mediated act. As artefacts the tools contain historically collected experience and are likely to change themselves, all elements in the practice influence each other, and introduction of a new tool often result in unforeseen changes (Wertsch, 1998). Subsequently, to fully understand this complexity, it is beneficial to look at the mediated subject-object relationship in its entirety – one could say as situated in a given, historical practice. Furthermore, when the tools in question are defined as digital media it seems only natural to draw elements of media theory into the considerations.

In 2008, I discovered an interesting place in SL called The Okapi Island. This island was designed by a team of anthropology researchers who had recreated a famous excavation site called Çatalhöyük, a 9000 year-old Neolithic village located in present day central Turkey. The island was used to teach students about anthropology, and the project was led by Professor Ruth Tringham, from the Department of Anthropology at UC Berkeley, USA.

Figure 4.5. Standing at the entrance of the Çatalhöyük excavation site in SL.

Based on experiences from this project, Tringham, Ashley & Mills (2007), wrote an article in which they introduced and used the concept of remediation to explain their design approach and their findings. As it happened, the concept of remediation turned out to make good sense in relation to my study as well, and in the spring of 2010, I was fortunate to be invited as a visiting scholar at UC Berkeley with Professor Tringham and her colleagues (cf. chapter one). During my visit, I worked on the concept of

remediation, trying to refine it in relation to different aspects of a remediated user-experience, including the user herself, the places, the practices, and the culture in general. I introduced the concept of remediation to the students already in the MIL08 cycle, and as we shall see, it became a key concept in terms of trying to make sense of our experiences in SL.

The concept of remediation was introduced by Bolter & Grusin (1999) in their book "Remediation. Understanding New Media", where they explore and exemplify the concept as means of explaining the design and use of new media e.g. like film, computer games, digital art, VR and the World Wide Web. In general, media are seen as technological agents that emerge from within cultural contexts, and along with the concepts of immediacy and hypermediacy, remediation is one of three traits of Bolter & Grusin's genealogy of new media. Throughout the book, remediation has several meanings, but it is defined as "the formal logic by which new media refashion prior media forms" in the glossary (Bolter & Grusin, 1999, p. 273). An example of this could be the way a word processing program on the computer remediates pen and paper. Refashioning handwriting not only affects the media in question, but also the practice.

A defining characteristic of new, digital media is that they oscillate between immediacy and hypermediacy, between transparency and opacity. Immediacy is seen as remediation aimed at diminishing the user's awareness of the media/the remediation; the media are hidden, thus providing the user a sense of transparency in relation to the experience of the "real". Conversely, hypermediacy is aimed at enhancing the user's awareness of the media/the remediation; the media are visible and provide the user with a sense of opacity in relation to the experience of the "real". A main claim is that the underlying premise of digital remediation is our "insatiable desire for immediacy": to go past the representation to achieve the real, not in a metaphysical sense, but as an emotional experience (Bolter & Grusin, 1999, p. 50). This refers to the following paradox of what Bolter & Grusin denote as the double logic of remediation:

> Our culture wants both to multiply its media and to erase all traces of mediation: ideally it wants to erase its media in the very act of multiplying them. (Bolter & Grusin, 1999, p.5)

The paradox also means that the authors do not see the two forms of logic as contradicting, but rather as mutually dependent, and the oscillation becomes central to understanding the process of remediation (Bolter & Grusin, 1999, p.19). Elaborating on remediation strategies Bolter & Grusin identify a number of ways based on different emphasis on either immediacy or hypermediacy by which digital media remediate their predecessors (Bolter & Grusin, 1999, pp. 44-50). Representing, borrowing, refashioning, absorbing, incorporating, and repurposing are all said to be strategies of remediation, and Bolter & Grusin end up suggesting that these strategies can be conceived of as a spectrum of strategies ranging from respectful to radical remediation (Bolter & Grusin, 1999, p. 200). Within this spectrum, one could argue that remediation

is fundamentally aimed at either reproducing without any apparent critique, called respectful remediation, or at reinventing based on critique called radical remediation.

During my visit with Professor Tringham, we discussed the terms respectful and radical on many occasions seeing as none of us were completely satisfied with this rather categorical way of describing these processes. Especially the term respectful seems to evoke associations toward processes that could be understood as simply reproducing prior practice without any critical reflection whatsoever. We did, however, decide to stick with these terms, not least because in our experience the terms were easy to understand and apply for both our students. Nonetheless, the terms are not unproblematic, and I will return to the usefulness of the remediation concept in chapter six.

As media theorists, Bolter & Grusin (1999) do not include an explicit educational perspective on remediation, nor do they make explicit reference to Vygotsky's original notion of mediation. Nonetheless, in Danish educational research the concept of remediation has gained influence as a way of discussing and analysing specific pedagogical practices mediated by new, digital media (Sørensen, Audon & Levinsen, 2010; Riis, 2010; Meyer, 2008; Hanghøj, 2007; Bo-Kristensen & Meyer, 2007), but also as a common way of describing the general process of redesigning and integrating new media in education (Sørensen & Levinsen, 2014). In other words, the inclusion of remediation into the pedagogical discourse has provided an opportunity to rethink, reframe, and reform pedagogical practice in specific, and education in general. Summing up the ideas from Bolter & Grusin (1999), and combining them with findings from my study it is possible to talk about two overall strategies for remediation of pedagogical practice (Riis, 2010):

- **Respectful remediation**. Main objective is to reproduce prior practice with no apparent critique – often focusing on a quantitative outcome. Other media are represented without manipulation in the mediation. In general, this type of remediation enhances the authenticity and enforces the authority of the original media and practice. Tradition, familiarity, and certainty are keywords in this strategy. Changes are experienced as minor, evolutionary modifications and typically only involve change in modality, not specific activities.
- **Radical remediation.** Main objective is to reinvent prior practice based on critical review – often focusing on a qualitative outcome. Other media are represented manipulatively in the mediation. In general, this type of remediation challenges both authenticity and authority of the original media and practice. Innovation, alienation, and uncertainty are keywords in this strategy. Changes are experienced as major, revolutionary transformations, and typically involve change in both modality and activities.

In both remediation strategies the aims of immediacy/hypermediacy can come into play, but the boundaries between immediacy and hypermediacy are nonetheless indistinct due to their oscillate and paradox nature. As an example of this, figure 4.6. below shows two physically distributed participants (avatars) that are engaged in writing collaboratively in a shared document (an Etherpad) from within SL (Riis, 2010, March 17th).

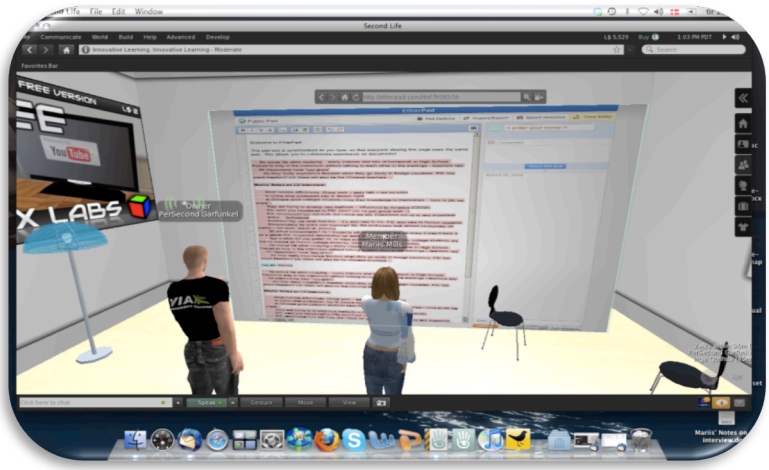

Figure 4.6. Two avatars collaborating in a shared document.

The connection to the world outside SL is established through "windowed" hypermediacy in the sense that the participants are aware of the medium that enables this connection. On the other hand, this hyper-mediated act also has the potential of resulting in immediacy insofar as the participants forget about the medium because the act reinforces the participants' experience of working together in common time and space despite physical distribution in the world outside SL. In this respect, there is an interesting resemblance between immediacy and immersion, and between hypermediacy and augmentation (cf. chapter two), which I will return to, as well.

In this study, I have used the concept of respectful and radical remediation to describe my overall design strategy in the research cycles, and as a way of thinking and talking about different types of re-mediation throughout the study.

Combined with the earlier mentioned elements from the communities of practice framework, this has resulted in a conceptual design model, figure 4.7. below, which will be used to describe the design strategy in the research cycles in the next chapter:

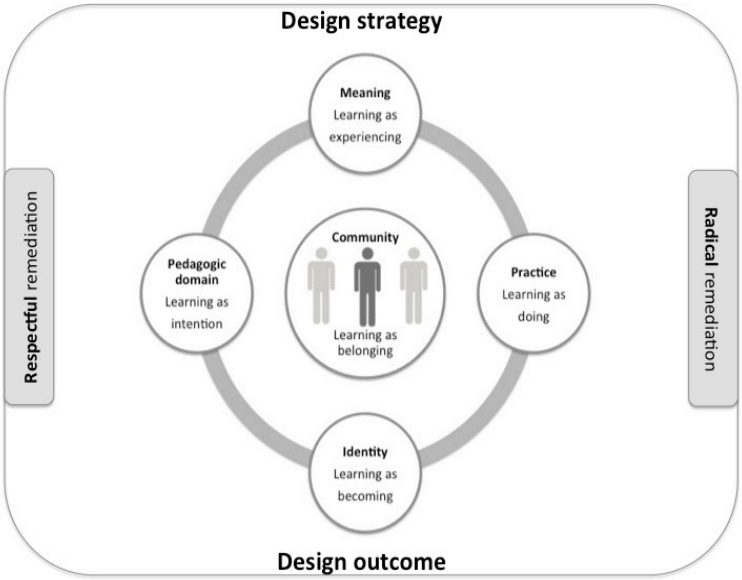

Figure 4.7. A conceptual design model.

CHAPTER 5.
TRANSFORMATION OF PRACTICE

In this chapter, I present the first part of my empirical work by describing the four research cycles, MIL07-MIL10. Each cycle is described in terms of: research interest and design strategy, pedagogical domain, time and space, participants, virtual learning environment, learning activities, learning experiences, and learning outcome. The design model, presented in the previous chapter, is used to describe the design strategy in each cycle. I conclude each cycle with reflections and point to design consequences for future iterations. In the final section, I summarise the design actions taken in all four cycles, and make recommendations for design.

5.1. PRESENTATION OF THE RESEARCH CYCLES

The descriptions of the four research cycles are presented in narrative format, communicating a series of related events, the context, and the pedagogic intentions that drove the design and the actions. The narrative format is inspired by Carr (1986), who describes storytelling as a way of giving phenomena, such as communities, existence:

> At whatever level of size or degree of complexity, a community exists wherever a narrative account exists of *a we,* which has continuous existence through its experiences and activities. When we say such an account "exists", we mean to say that it gets articulated or formulated, perhaps by only one of a few of the group's members, in terms of the we and is accepted or subscribed to by the other members. (Carr, 1986, p. 163 – original emphasis)

In other words, the four stories are my way of articulating and documenting the existence of the communities that emerged throughout the research cycles, and again, since practice is a response to design, these are the stories of how the design evolved and how the students responded. By way of using the words of the students (in terms of quotations), I am hoping to convey *a we* as opposed to an exclusive *I*, and to provide the reader with a better account of the meanings of the students' experiences.

These stories are not to be seen as definitive theoretical analyses, as I will return to the findings in chapter six, but rather as critical reflections based on grounded evidence. The reconstruction of the stories is based on data from my engagement in the research cycles as well as engagement in my PLN, and includes both failures and successes to enable a better understanding of the connection between the grounded data and the actions taken. Decisively, the intention of these stories is to report the emergence of the design and the actions in a way that can be traced by others, enabling the reader to

understand the subsequent findings presentation, and to evaluate by himself/herself their potential appropriateness for similar settings.

5.2. THE MIL07 CYCLE

In this section, I present the actions taken in the first research cycle, where the research interest was to explore Second Life (SL) as virtual learning environment (VLE), and its impact on the community.

5.2.1. MIL07 RESEARCH INTEREST AND DESIGN STRATEGY

The first research cycle was conducted in the late fall of 2007, and as summarized in table 5.1. below the research interest (RI) in the MIL07 cycle was to explore SL as VLE and its general impact on this pedagogic community of practice. Since the research interest was highly exploratory, no problem solving interest (PSI) was identified at the offset of the cycle.

Research cycle	**Research interest (RI)**	**Problem solving interest (PSI)**
MIL07	Explore SL as VLE and its general impact on the MIL community.	- none (at the offset)

Table 5.1. MIL07 Research interest.

In terms of design strategy, I wanted to gain experience with SL before making any decisions. My initial expectation was the MIL community would thrive in SL, just as they usually did in FC, and I paid no special attention to any of the particular elements in the community of practice. Therefore, only the respectful remediation element is highlighted in the design model, in figure 5.1. next page.

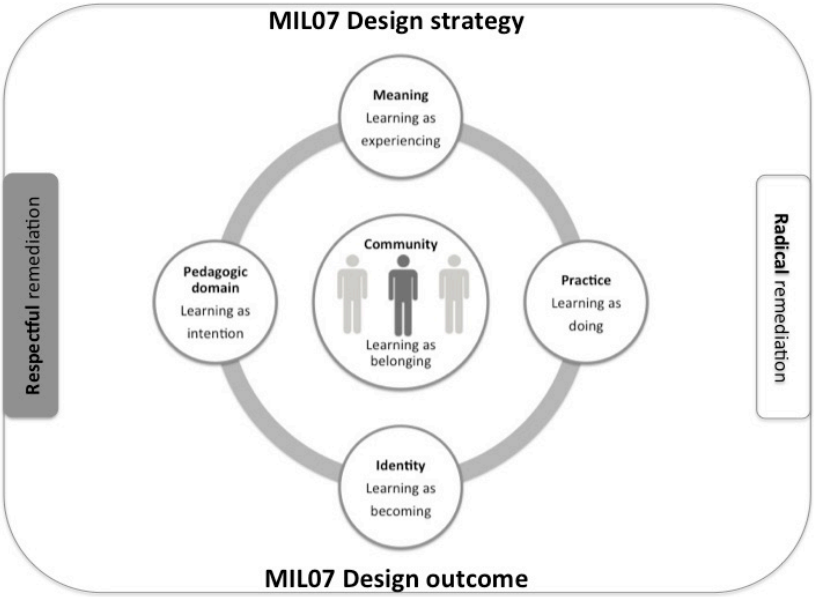

Figure 5.1. Design in the MIL07 cycle.

5.2.2. MIL07 PEDAGOGICAL DOMAIN

As previously mentioned, the course was one out of two courses in the MIL programme's module 4. In this first course entitled "Educational design, ICT-based learning products, and virtual environments; theory and analysis", the students were expected to conduct a Didactic Analysis of the chosen technology as a virtual teaching and learning environment, and as the title indicated, focus should be on theory and analysis.

In this cycle, the learning goals remained unchanged, and the assessment criteria from the original course were maintained as well. To pass the course, the students were expected to write a minimum of three postings individually thus contributing to the didactic discussions and reflections in the asynchronous 2D environment FirstClass (FC), and the sum of the students' postings would constitute their didactic analyses. In other words: the assessment criteria and method were tied to the FC-environment, and not to SL.

A print compendium of texts concerning ICT in relation to Didactic theory and design covering all of the module's topics was provided. The compendium was aimed at covering general didactic topics independent of technology, so that it could be used

regardless of chosen analytical object[41] in the course, and later for the study activities in the subsequent course two of the module, which focused on design and implementation. I suggested a few optional texts on SL, and the students were given a written guide on how to get off to a good start in SL. The guide covered the most basic functionalities and featured relevant places, mainly focusing on educational purposes. As the course progressed, both the students and I shared SL related resources from the blogosphere and the Internet in general.

5.2.3. MIL07 TIME AND SPACE

The course ran from November 5th through December 17th 2007. The week from November 5th through November 11th was considered as preparation period, because the students were finishing other study activities and they were expected to start reading for the upcoming module. Furthermore, the preparation week also included a two and a half-day face-to-face seminar. In effect, this meant that the course ran online for five weeks. At the seminar, I conducted a three-hour workshop that was a blend of a lecture, which covered 3D virtual worlds in general, and a hands-on part focused on basic features in the SL viewer. All students enrolled in MIL's module 4 attended the lecture, and they were not asked to make their final choice between analytical objects until after the lectures on the two available analytical objects. Regardless of choice, the course would be credited with four ECTS, meaning that the students were expected to study for 110 hours.

The study activities took place in three different locations: at the seminar, at the participants' workplaces, and in the participants' private settings. Optional activities inworld, implemented during the course, took place between 8-10 PM. The seminar was located at Roskilde University, and I had arranged for a computer room with the SL clients installed on the machines. However, because the company behind SL, Linden Labs Inc., had made restrictions on the number of accounts possible per IP address, I had asked students, who were certain about their choice, to create their accounts prior to the seminar. This would also enable the students to check if they were in fact able to run SL satisfactory on their private computers, and eventually the students who chose this SL course preferred to use their own computers for the hands-on part.

5.2.4. MIL07 PARTICIPANTS

One teacher (me) and twenty-two students participated in the course. The profile of the students matched the general profile of MIL students. The majority, nineteen students, worked in the educational sector, and three students worked in the business sector. All students were working with teaching or training at some level in their organisations.

[41] As mentioned in chapter four, the students could also choose the 3D game "Global Conflicts" as analytical object instead of SL in this course.

Seventeen students were following a regular study mode meaning that they had completed the previous four modules (1, 2, 3, and the first year project) before entering the course. Four students were full-time students meaning that they were also following another course in another module simultaneously with this SL course. One student returned from a study break, and thus did not belong to the community in the same way as the rest of the students. All participants were considered to match the profile of being relatively tech-confident in terms of general ICT, the majority did, however, not have any experience with SL or other virtual worlds and games.

As it had been the case in previous courses in this module, the students were organized in smaller course groups, and they were mainly committed to these groups, but the students were encouraged to engage in the discussions in other groups as well. The role of the teacher was to facilitate and moderate the asynchronous discussions in FC, whereas the role of the teacher in SL was less clear.

5.2.5. MIL07 VIRTUAL LEARNING ENVIRONMENT

The virtual learning environment used in the course consisted of a combination between FC and SL with the vast majority of the study activities happening in the former. The arguments for maintaining the use of FC were both technical and pedagogical. From a technical point of view, I knew SL to be highly unstable and therefore wanted to ensure we had a teaching and learning space regardless of how SL would perform. From a pedagogical perspective, I wanted to maintain a possibility for asynchronous communication, partly to allow me to communicate messages of a more organizational character that would be stored, and partly to support the students' reflections and analyses through asynchronous discussions.

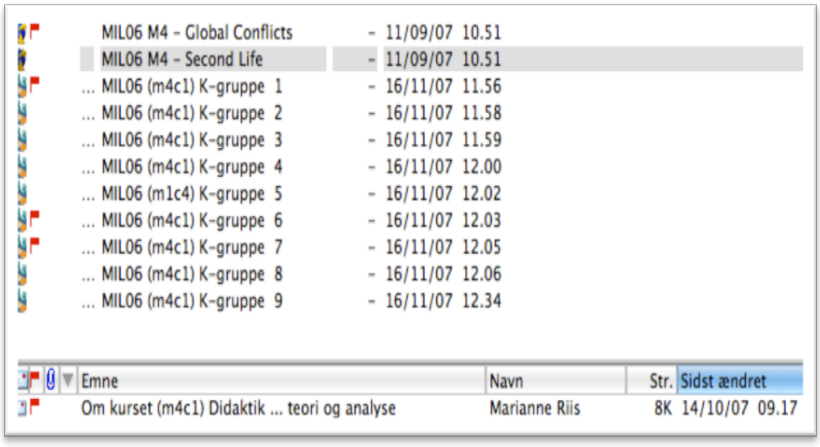

Figure 5.2. FC in the MIL07 cycle.

In FC, there were three forums for study activities organized as in previous MIL courses:

- MIL06[42] M4 – Second Life – main conference for the SL course used for general communication between the teacher and the students
- MIL06 (m4c1) K-gruppe 2, 3, 4, 5, 8 & 9 – were the students' own conferences used for their group discussions
- Main conference (below the bar) – the overall conference for the course that was used for general communication regardless of the students' choices of analytical objects

In view of the fact that the MIL programme did not have a dedicated place in SL when the course started, the students were recommended to visit a friendly place, an island called Wonderful Denmark (WD), and to make this their home position. On this particular island, the students could expect to meet other Danish users as it was an island with high traffic, and they could expect to find help and tips on places to explore and events to participate in.

5.2.6. MIL07 LEARNING ACTIVITIES

The main objective of the course was for the students to conduct a written, didactic analysis of SL. In order to ensure that these analyses covered curricular elements, the students were (as in prior courses) asked to discuss and analyse SL based on five predefined sub-topics:

- Didactics and target groups
- Orientation and navigation
- Interaction
- Learning processes
- Audio-visuals

Furthermore, the students were encouraged to address self-chosen didactic questions and elements and to relate their reflections to practical use in their work settings. As seen from the perspective of the curriculum, the purpose of the course was not for the students to learn about SL per se, but to learn how to conduct a satisfactory didactic analysis. Given the chosen design strategy, the students were expected to engage in self-directed learning individually and in their study groups. In previous courses, MIL students were also expected to explore and analyse virtual learning environments on their own, whereas the teacher typically would focus her attention on moderating the asynchronous discussions in FC.

[42] Since the course was placed in the second study year, in the FC logic the students belonged to MIL06, which explains the prefix, and why the prefixes throughout this study appears to be dated by one year.

No scheduled or mandatory activities were planned in SL at the outset of the course. The students were encouraged to "friend" the teacher inworld to get help in mastering the medium, and to meet for informal activities. The students were also encouraged to connect with four experienced SL users, who had agreed to meet with the students and show them how they used SL in their particular practices.

5.2.7. MIL07 LEARNING EXPERIENCES

The design strategy quickly proved to fail. In the first couple of weeks, student activity in both environments was limited, and the majority of the asynchronous posts in the FC-environment were based on theoretical argumentation with almost no relation to SL. Further, hardly any of the groups worked collaboratively in FC or SL. In FC, most groups decided to delegate responsibility so that each student was in charge of one of the sub-topics. In terms of initiating contact with other SL users, the majority of the MIL07 students preferred to go to the WD Island, where the main language was Danish, and about a dozen of the students joined an inworld group affiliated with WD. Because there were no communal pre-scheduled activities in SL, the majority of the students decided to log in on their own. Consequently, several students expressed confusion with regard to especially orientation and navigation in SL, and not least lack of meaningful inworld activities, as these quotes illustrate:

> The second time I logged in, I was in a bit of a crisis! I couldn't figure out how to proceed from Orientation Island[43]. There was a sign indicating that you could move in to the real SL, but I didn't really succeed. Our first meeting was approaching, so I started to panic. But suddenly I was there, I was curious and found it very funny to teleport, search for gardens and fly through tree tops. But at the same time, I was wondering: What am I supposed to do here? (MIL07-FC-discussion-November)

> When you arrive in the different universes, it is often difficult to get an overview and find answers to questions like "where am I?", "where have I been?", "where can I go from here?", and not least "why should I?". The motivating factor based on assignments and visible indicators of a job well done is absent. Therefore, SL is often reduced to a piece of social software, where people chat and wander pointlessly around. (MIL07-FC-discussion-December)

[43] When students in MIL07 first logged in to SL, they were - per default - located on a so-called Orientation Island, where they had to learn basic SL skills before they could enter the public grid, where the real action was.

> Despite the many hours, [student's avatar name], has spent exploring SL since he was born on November 11th 2007, it is still difficult to say something about the value of using SL. It seems very cumbersome to create objects and surroundings. But I do see exciting potential. However, the system has to be further developed so that it becomes more simple and user-friendly. (MIL07-FC-discussion-December)

> I've been in many places where I was really unsure about the "purpose". (MIL07-FC-discussion-December)

Interventions were necessary and resulted in five scheduled, but optional inworld activities facilitated by the teacher. At this point in the course, I did not find it realistic or reasonable to implement mandatory activities. As previously mentioned, one of the hallmarks of the MIL programme is the flexibility in time, and a sudden change in this, could mean that several students would not be able to meet such new demands. The implemented activities included:

- Two visits to meet experienced SL users/educators, Kip Yellowjacket & Inge Qunhua,
- A tour to hear public talk by Vilen Shepherd[44] arranged by a Danish library,
- An exploratory tour to see a university consortium remediated into SL (this was recommended by one of the students, who had discovered the place), and finally
- A social event to finish off the course inworld (Christmas celebration)

Summing up, there were five scheduled activities, and with 31 attendees out of 110 possible, the overall attendance was 28%. A detailed overview of the student attendance[45] in the scheduled MIL07 inworld activities is shown in table 5.2. next page.

[44] Vilen Shepherd is Stine Gotved RL, independent Danish researcher, and consultant with a PhD in cyber-sociology.

[45] Sessions in SL typically ran for two hours, but not all students attended from the beginning and/or throughout the sessions. Numbers are based on attendees in the first half hour, and should be regarded as an estimate.

MIL07 – Student (n=22) attendance in inworld activities		
Activity	Number of students (total)	Attendance
Vilen Shepherd talk (n=1)	9	40%
Visit to Kip Yellowjacket's place (n=1)	6	27%
Visit to Inge Qunhua's place (n=1)	4	18%
Visit to U21 Global University (n=1)	4	18%
Christmas celebration (n=1)	8	36%

Table 5.2. MIL07 – Student attendance in inworld activities.

Another important intervention was the establishment of a shared inworld place in the third online week of the course. Not having a designated MIL location in SL clearly contributed to the students' lack of orientation and lack of belonging to a particular community. A friendly Danish user, the owner of the WD Island, Doctor Asp, helped by lending us a place which included references to the MIL programme in the shape of a picture from the programme's web-site and a programme brochure lying on one of the "tables" as shown in figure 5.3. below.

Figure 5.3. The MIL07 holodeck.

The dubbed "MIL holodeck"[46], contributed to the tentative establishment of an inworld community space, as it quickly became the place to be. From that on forward, the students used the holodeck as point of departure, a place to change avatar appearance (e.g. hair or clothes), and a place to try out and train different SL functionalities such as to sit on or to open objects, or to adjust camera and voice settings. Finally, it also became a place to meet and engage in subject matter discussions and reflections on inworld experiences when the students and I met ad hoc.

Notwithstanding, that the interventions came too late for all students to fully profit, these activities did have a positive impact on the remaining part of the course. One of the students who participated in the first scheduled activity, the tour to the U21 Global University Consortium, had been to this particular location twice on his own. After being there together with fellow students and me, he reflected on how this influenced his experience:

> It was an exciting experience to walk around with [avatar names]. Completely different from walking around alone in there. (…) One of the things I found nice on this third tour to U21 Global, and something that was missing the two other times where I was there alone, was that by moving around with others you had the opportunity to share your experiences e.g. via speak, chat, note cards, or post cards. In addition you could share information about the good places where you could go together, and that created a shared learning narrative. Also, you were able to create a shared repertoire that you could use the next time you met in the virtual world. My experience was that this third time resembled a learning community of practice where the more experienced helped the newcomers. (MIL07-FC-discussion-December)

Another student also highlighted the promotion of community feeling when using SL together with other users in her final reflection on the potential of the medium:

> I wonder if Wenger has an avatar? I think he would be impressed by how much SL supports the creation of communities. I think you quickly realise that SL is too complicated for you to learn all features on your own. Hence, you seek contact and community with other more experienced users. These experienced users are mostly very helpful and readily help by sharing knowledge and practical skills. (MIL07-FC-discussion-December)

One student, who participated in a visit to Kip Yellowjacket's place for English teachers in SL (figure 5.4.), described how meeting someone who actually used SL in his practice inspired her and gave rise to questions regarding learning activities:

[46] A holodeck is a product/technique used to save different forms of content (e.g. furniture settings or even an entire environment), similar to "holodecks" used in various sci-fi television shows and movies. A SL holodeck allows for a large variety of rooms or scenarios to be loaded/rezzed in an easy way using limited space.

It was really interesting to hear about Kip's experiences with language learning in SL and to watch his demonstration of some of the particular teaching facilities. Among other things, there was a "building" – a big arena – where Kip like a magician could bring forward different teaching contexts, e.g. he showed us a courtroom and a hotel foyer[47]. As I understood it, he didn't use these facilities himself since he preferred to be in open spaces. He also demonstrated another function (a bit game-like) that was a sort of a "multiple choice" test. This possibility of doing tests in SL surprised me a bit, didn't think that kind of activity was "politically correct". (MIL07-FC-discussion-December)

Figure 5.4. MIL07 class visiting Kip Yellowjacket.

In the second visit, we met Inge Qunhua, an experienced SL teacher, and designer from Denmark. During the meeting with Inge, we had an interesting discussion about technology adoption, and again meeting someone who actually used SL, inspired the students' reflections, as in this example:

> Whether you look at formal or informal learning processes in SL, a common objection is that the learning curve is (too) steep, and this holds true for both the learners and the teacher, who has to plan the didactic design. However, as Inge Qunhua mentioned during the MIL visit in SL on Wednesday 12/12, there will always be barriers towards technology appropriation, and she mentioned the VLE Fronter™ as an example, and this is something I can relate to judging from many of my colleagues who still don't feel comfortable using that system. (…) After a somewhat sceptical reluctance during my first visits in Second Life (SL), I'm little by little convinced that of course SL and similar 3D-environments have a future. Presumably, it will be for a small

[47] What the student is describing here is in fact a holodeck.

> academic elite in the beginning – just as it was the case with the Internet. (MIL07-FC-discussion-December)

Besides contributing to the students' sense of belonging to a community, meeting SL users who were able to "show and tell" how they used SL in practices relevant to the course's subject matter/domain clearly inspired the students and informed their reflections. Furthermore, during these meetings the students were forced to employ different SL skills such as movement, camera control, and communication, and this contributed to their mastery and understanding of the medium in a more grounded manner. In hindsight, none of this was surprising. However, having experienced how MIL students previously had approached other technologies as analytical objects, I was admittedly surprised by just how complex and alienating these MIL07 students perceived SL.

Figure 5.5. MIL07 class participating in Vilen Shepherd's talk at Info Island DK.

Technical challenges were contributing factors to the difficulties perceived by the students in all four research cycles. Especially in the MIL07 and MIL08 cycles, SL was highly unstable and required regular updates. Both the students and I experienced several instances of lag slowing down activities such as movement and communication, and frequent crashes resulting in disruptive and unpleasant experiences, as exemplified in these statements:

> I wasn't really impressed by the graphics in the program. Furthermore, the program – inexplicably – often crashes resulting in the game characters' delayed reaction to navigation. (MIL07-FC-discussion-November)

> There are frequently problems with audio, not background sounds; music, parties, or nature sounds, as these are part of the program, the audio problems occur when avatars have to talk to each other. Either you cannot hear anything

> or there is an echo. When you teleport to a new place, you need to be patient because it takes time for the surrounding environment such as trees, waterfalls, furniture etc. to become visible and until then, you are standing in an empty landscape. (…) It's the technology that creates the limitations. (MIL07-FC-discussion-December)

Many technical challenges and difficulties were also caused by insufficient hard- and software, and lack of knowledge about especially audio settings. While the technology in itself should not be underestimated, I will not go into details regarding technical requirements in this study. Suffice to say that some of these challenges can and should be addressed in the design of the course, as we shall see in relation to design consequences below.

5.2.8. MIL07 LEARNING OUTCOME

Despite difficulties, all 22 students passed the course. For three students this only happened after they were asked to further elaborate on their analyses in order to meet the qualitative demands. There were 358 postings in FC, 221 directly related to the subject matter. The main goal of the course was for the students to learn how to conduct a Didactic Analysis, and the students managed to learn this. The students also learned about SL, but their analyses reflected the poor course design insofar as for the majority of the students, their approach to SL remained cautious revealing a lack of knowledge grounded in inworld practice.

As mentioned in chapter three from 2007-2009, the students evaluated the modules through anonymous surveys upon completion. However, since these surveys did not distinguish between the different courses in the modules, the results cannot be used. Instead, in the MIL07 case, I chose to conduct a group interview with five students concentrating on critical elements in the course design and a focus on how the avatar phenomenon had affected the students' learning. Based on the interview, eight points related to SL and the general design of the course are emphasized here:

1. *SL as analytical object and the curricular goals of the course.* In general terms, SL was regarded as an excellent analytical object because the richness of the medium provided the students with numerous examples in relation to the designated topics in the course, i.e. rich visualization to support the students' reflections on the role of visualization in design for teaching and learning. However, the respondents also mentioned the richness of the medium as a major challenge to adoption, insofar as the many features of the medium added to the overall complexity.
2. *SL and the students' prerequisites.* None of the respondents had any prior experience with virtual worlds in general, and none of them were gamers. The respondents were all surprised by how much time they had felt it was necessary to spend to get a sense of mastery of the medium.

3. *SL and the target group*. Despite their own personal difficulties, the respondents felt that SL could match the target group (adult learners) very well providing the general course design was changed to putting more emphasis on mastery of the medium and more emphasis on relevant activities inworld.
4. *SL and the learning processes*. Since there had been no planned activities from the beginning of the course, the respondents had been forced to reflect upon and evaluate their personal learning processes in the course, and this was regarded too abstract and too difficult to truly evaluate the potential of the medium. The interventions (in which all respondents had participated in at least one) were mentioned as better examples of learning processes that could be analysed.
5. *SL and general possibilities of interaction*. The respondents were all impressed by the many possibilities of interaction offered in SL, and the ability to construct things was highlighted. Even though only one of the respondents had actually experimented with building and scripting, they all felt that this was one of the most important features that would set SL apart from other types of (2D) virtual learning environments. The ability to meet people from around the globe was also mentioned as an interesting potential. The interaction between avatars was considered as one of the challenges, partly because new skills were needed, and partly because the culture (in terms of social interaction) in SL was considered as something that needed to be learned as well.
6. *SL and different modes of communication*. The fact that the majority of communication in SL is synchronous was greatly appreciated and seen as a nice "break" from FC discussions and as a better way to quickly clear misunderstandings. On the other hand, the respondents were also critical of the lack of asynchronous possibilities in terms of facilitating reflection. Note cards[48] were mentioned, but were not considered a viable alternative to more traditional, 2D written discussions.
7. *SL and teacher facilitation/role*. In the FC discussions before the interview, one of the respondents had mentioned that he would prefer "a more old-fashioned pedagogical approach" to learn about SL (MIL07-FC-discussion-December), and during the interview, I asked him to elaborate on this. Despite being used to self-directed learning in other MIL modules and courses, the respondents agreed that the richness and complexity of SL called for more traditional instruction from the teacher to ease the adoption and mastery of the medium.
8. *Avatar representation and student identity*. All respondents were highly surprised by how they had reacted to being represented as avatars. For better and for worse, the avatar phenomenon had challenged the respondents throughout the course, and the avatar had clearly been an ontological and professional challenge. For all respondents but one, the mere idea of being represented by a virtual figure had been provoking and had forced the respondents to reflect on issues of reality: what was real and what was not? Professional identity was

[48] Note cards are written inworld documents that can be shared and stored.

mentioned as another explanation as to why it had been so difficult to accept being avatars. The respondents mentioned that they were not used to being clumsy, helpless, and out-of-control – especially not in teaching and learning contexts. In spite of shattered self-images, the respondents all pointed to the benefits of being forced into the roles of newbies and learners, and this was mentioned as one of the crucial parts of the course that had changed their views on ICT-based teaching and learning significantly. As learners, they were not used to being forced to ask for help and guidance as often as they had felt the need in SL, and it was considered very enlightening in terms of reflection upon student and teacher identity, roles, and responsibilities. Finally, when asked what sets SL apart from other virtual learning environments, the avatar phenomenon was considered the most different feature, because "in other virtual learning environments we don't have to re-learn to speak, walk, dress, and behave before starting the learning process." (MIL07-Interview-January).

Many lessons were learned from this first research cycle both in terms of the course design and the use of SL in a pedagogic setting. Even though, FC also played a part in the course, my reflections and the design consequences I derived from this research cycle, will primarily focus on SL because of its relevance to this study's research questions.

5.2.9. MIL07 REFLECTIONS AND DESIGN CONSEQUENCES

The research interest in the MIL07 case was to explore SL as virtual learning environment and its general impact on this pedagogic community. Based on a respectful remediation strategy, I decided to re-use the existing design that previously had worked very well with other types of technologies as analytical objects in this course. Yet, as noted, this strategy quickly proved unsuccessful due to the complexity and unique affordances of SL. The use of SL, gave rise to ontological challenges for the students, mainly due to the avatar-mediation and the general nature of the 3D environment. These challenges are described and analysed in chapter six. Furthermore the use of SL, gave rise to pedagogical challenges due a combination of the medium and the course design. One of MIL's core principles, namely that of self-directed learning, proved too difficult for the MIL07 students in relation to SL. Technical challenges, as well as a general lack of purpose for inworld interaction and not least lack of meaningful inworld activities, were identified as the major obstacles for engagement and participation in SL.

As mentioned in chapter four, Wenger, White, and Smith (2009) have identified three pairs of polarities (rhythms, interactions, and identities), which can be used to focus attention on inherent technological tensions that a community of practice likely will face in its adoption of a new technology. I have already stressed several times that practice, in the words of Wenger (1998) can be seen as a response to design. By means

of using the three polarities, it is possible to describe and reflect upon how the MIL07 students responded to the design of the course and the adoption of SL.

MIL07 students' responses in relation to rhythms (togetherness and separation)

Overall, the MIL07 students (and I) never succeeded in establishing a productive rhythm and balance of togetherness and separation in time and space in SL. Formation of a community of practice requires sustained mutual engagement over time, but due to the shortcomings of the course design, the MIL07 students never managed to create sustained "community time" inworld. As evidenced, the interventions came too late for the majority of the students, but on the other hand, these interventions revealed the inherent potential for communities of practice in SL. Similarly, due to the course design, the MIL07 students felt separated in terms of having a "community space" in SL, and though the establishment of the MIL holodeck came too late as well, it demonstrated the importance for the members of this community to have a place inworld they could consider "home". Ironically, in this MIL07 course, togetherness was by large based on participation in the asynchronous FC discussions, and not in the social world of SL.

It should be noted that technological challenges, such as crashes, often contributed to the students' impressions of inworld separation (in all four research cycles). While crash of any technology evidently will create tensions between feelings of togetherness and separation, other technological challenges particular to SL (e.g. functionality) that also created tensions, will be dealt with in the subsequent chapters.

MIL07 students' responses in relation to interaction (participation and reification)

A combination of participation and reification is fundamental to the process of meaning making and learning in any community of practice. In MIL07, the course design did not promote inworld participation, and the possibilities for reification inworld were absent insofar as the majority of the students never realized how to create virtual objects. Due to the lack of possibilities to participate with fellow students inworld, the MIL07 students were by design left to negotiate the meaning of their experiences of SL in the FC-environment. In should, however, be noted that the few communal gatherings we did have, always initiated intense negotiations revealing a potential.

MIL07 students' responses in relation to identities (individuals and groups)

While togetherness through participation with others is a property of communities of practice, it is experienced individually, and this can cause a tension between the individual and the rest of the community. The MIL07 cycle only provided limited

opportunities for togetherness in SL, and it is therefore difficult to reflect on and more so to conclude on such tensions. However, another identity related tension occurred due to the avatar-mediation, which clearly challenged the MIL07 students to reflect on identity matters, and as we shall see in chapter six, the students' experiences with the avatar were very diverse. Even so, and again due to the poor course design, these reflections remained largely of a private character. As a result, only few students managed to bring these reflections to the next level by connecting the meaning of avatar identity to its influence on learning and the community.

In effect, the three polarities revealed little in terms of SL as learning environment, but then again, they highlighted how the pedagogic design (or lack of) influenced the limited adoption of SL in MIL07. One could ask why limited adoption of SL posed a problem, especially since the purpose of the course was not to learn to master, but to analyse SL as virtual learning environment? The answer to this can be found in the epistemological backdrop of the course (and of this research project) in terms of the warranting of subjective knowledge (cf. Ernest, 1995). In the communities of practice framework learning, and thus also generation of subjective knowledge, happens through an intertwined process of belonging, becoming, experiencing, and doing. Yes, all students passed the course, but some of their reflections were quite speculative (and sometimes wrong), which in hindsight is not surprising: how can you analyse e.g. a learning process in SL, if your experience with such has been highly limited?

The communal activities that we did engage in further revealed the complexity in terms of the role of the teacher in such an environment. The students' had numerous question regarding both technological issues and pedagogical possibilities, and as such these questions illustrated the scope of the knowledge needed to be able to teach in SL. During the course of this research cycle, it became quite evident that I myself needed to learn more about SL in order to facilitate more meaningful learning processes inworld.

As a researcher, this was my first experience with structured participant observation in SL. Again; the lack of designed activities posed a problem. In the beginning of the course, my encounters with the students were random and the activities we happened to participate in (often by chance) were diverse ranging from a casual conversation in the town square on the WD Island to trying out specific technological features of SL. While there is an inherent learning potential in all such activities they did not in any structured way reveal much about the pedagogical potential of SL. Looking back my field notes were one big unfocused mess.

Summing up, the findings from the MIL07 cycle clearly showed that a revised design strategy, with a stronger focus on design for cultivating the inworld community, was needed. Consequently, I decided to continue the study of SL's general impact, but also to develop, implement, and evaluate a range of inworld activities in the next research cycle.

5.3. THE MIL08 CYCLE

In this section, I present the actions taken in the second research cycle, where the research interest was to study SL as VLE, and the impact of different activities on the community. The problem solving interest in this research cycle was to design, implement, and evaluate inworld activities as a means to solve the problem of lacking participation in SL. The chosen design strategy was still based on a respectful remediation, but with minor radical alterations based on the experiences from the MIL07 cycle. Further, the design was guided by principles for cultivating communities of practice (Wenger, McDermott & Snyder, 2002). In this research cycle, I added two new design principles targeted specifically at the avatar phenomenon and inworld participation.

5.3.1. MIL08 RESEARCH INTEREST AND DESIGN STRATEGY

The second research cycle was conducted in the late fall of 2008, and the research interest in the MIL08 cycle was to study SL as virtual learning environment and to study specific activities' impact on this pedagogic community. Based on the experience from the MIL07 cycle a specific problem solving interest (PSI) was identified as summarized in table 5.3. below.

Research cycle	**Research interest (RI)**	**Problem solving interest (PSI)**
MIL08	Study SL as VLE, and the impact of activities on the MIL community.	PSI1: How can design of inworld activities solve the problem with lacking engagement and participation in SL?

Table 5.3. MIL08 Research interest and problem solving interest.

Since the curriculum was unchanged, the design remained respectful to some of the fundamental elements of the course. Hence, the purpose and the learning goals remained unchanged, and so did the assessment criteria. Once again, to pass the course students were expected to write a minimum of three postings individually thus contributing to the didactic discussions and reflections in FC, but I decided to organize the students differently as one big group or community instead of in separate smaller groups. In the MIL07 cycle, there was a tendency for the students to stay relatively isolated in their course groups. The new organization was chosen to facilitate a stronger sense of community with joint enterprise and responsibility among all members. Nonetheless, I also aimed at implementing more radical elements in the design. Figure 5.10. next page shows the highlighted elements in this cycle.

The most radical changes were related to the design of numerous inworld activities. Yet, based on how alienating and different the MIL07 students found SL, I decided to employ a respectful strategy in terms of the majority of activities in SL, i.e. by respectfully remediating RL lectures (called Didactic Design Discussions), whereas more radical activities (i.e. such as exploring a simulation of a human testis as part of the so-called Tours) were limited. In the beginning of the course, I tried to design activities that were as similar to the students RL experiences and expectations as possible. Even so, as the course progressed, I did try to challenge the respectful remediation by showing the students activities and places not possible in real life (NpIRL) to demonstrate and discuss some of the unique affordances of this kind of virtual environment.

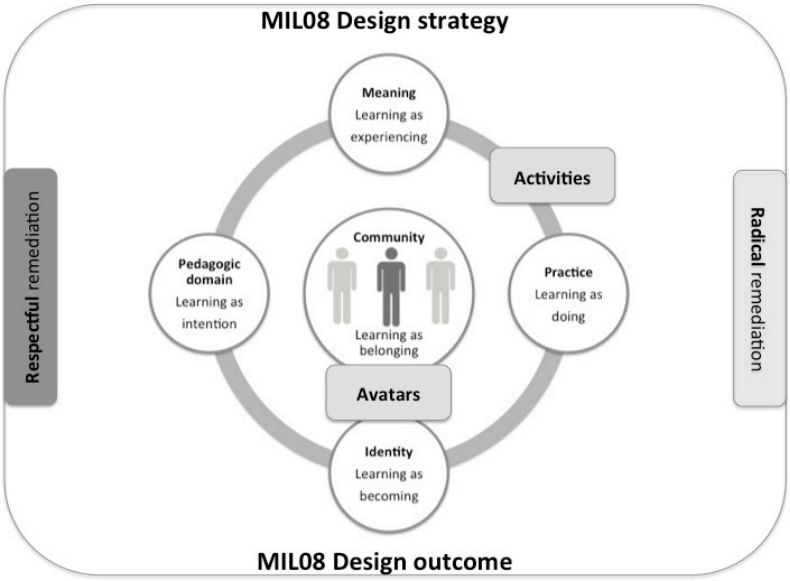

Figure 5.10. The MIL08 cycle.

In the MIL08 cycle the design strategy was inspired by design principles derived from Wenger, McDermott & Snyder's (2002) ideas about cultivating communities of practice. In practice, the principles are highly intertwined and interdependent, and the separation here simply serves to provide overview. The following principles summarise the overall MIL08 design strategy:

1. **Design for evolution** – as we shall see below, the activities I designed for MIL08 were aimed at facilitating the students' mastery of both the medium and of the subject matter/domain, and these activities were designed to facilitate a progression in the course. Further, I decided to offer the students an opportunity to design and lead activities on their own, so that they could

share their findings and perspectives regarding SL with the rest of the MIL08 community.

2. **Open a dialogue between inside and outside perspectives** – based on the positive experiences from MIL07, several activities were designed to meet other professional SL users – both from the educational and the business sector to match the student profiles.
3. **Invite different levels of participation** – the students were encouraged to participate in as many activities as they liked (note principle 9 below). Further, on a very pragmatic level, the students were told that they could join inworld activities at any time, meaning they did not have to be present in the beginning of a session to be able to participate.
4. **Develop both public and private community spaces** – as mentioned, the MIL holodeck was used as our community "home" from the onset of the course, and even though it was not closed for the public, its location high up in the air above the WD Island, did provide a sense of privacy. Additionally, the creation of an inworld MIL group (see below) enabled us to chat privately when we were out exploring the public grid.
5. **Focus on value** – the activities were designed to add value to the students' mastery of both the medium and the subject matter, and the overall course design was naturally aligned with the curricular goals.
6. **Combine familiarity and excitement** – the focus on both respectful and radical remediation in relation to places and practices inworld were designed to facilitate both familiarity and excitement in terms of new perspectives on the domain.
7. **Create a rhythm for the community** – inworld activities were designed not only to support negotiation and creation of meaning, but just as important to promote a sense of liveliness, a rhythm of participation.

Furthermore, based on the experience from the MIL07 cycle, I decided to employ two more design principles. Based on the MIL07 students' considerable attention on the avatar phenomenon, I added a principle focusing on identity. Even as, Wenger's four central aspects of learning in a community of practice (identity, meaning, community, and practice) arguably are inherent in the original seven design principles, the avatar and the identity issues raised hereby constitute a unique property of SL. Hence, when designing for cultivation of a community of practice in SL, it makes sense to make identity an explicit focal point.

8. **Support avatar and identity exploration** – besides focusing more explicitly on the avatar phenomenon in the introductory f2f-workshop, I created a conference for presentation of the students' avatars in FC, thus signalling its relevance. The designed Get-off-to-a-good-start sessions dealt not only with manipulation and creation of objects, but also with altering the avatars appearance and learning how to control the avatar's behaviour. Further, aspects related to the avatar were included in the didactic discussions inworld.

Finally, I added a principle focusing on inworld participation. As mentioned, the PSI-interest in this research cycle was to try to solve the problem with lacking engagement and participation in SL. While Wenger, McDermott & Snyder (2002) do address participation in the third principle; I wanted to ensure that all students actually experienced a designed teaching and learning situation, and therefore I decided to make one inworld activity mandatory.

9. **Promote inworld participation** - the students were asked to participate in one, mandatory activity. Since one of the qualities of the MIL programme is flexibility, I did not want to force the students to participate in any particular activity, but left it up to the students to choose among the 25 designed activities/sessions.

As part of the development and implementation of different learning activities, I also decided to invite two Danish inworld colleagues to facilitate so-called "building classes" aimed at enhancing the students' skills and understanding of reification inworld. Based on these overall guiding principles, changes were made in relation to all the pedagogic categories, as will be further explained below.

5.3.2. MIL08 PEDAGOGICAL DOMAIN

The curricular context for the MIL08 case remained unchanged. The course was still one out of two courses in the programme's module 4, and again the students were expected to conduct a Didactic Analysis of SL with focus on theory and analysis. Again, a print compendium of texts concerning ICT in relation to Didactic theory and design covering all of the module's topics was provided, however, more optional texts on SL than in the first course were suggested. The guide to SL was replaced by smaller more targeted written instructions, a Picasa directory with links to approx. 100 locations inworld covering a variety of places and purposes, and a Google calendar with 25 scheduled activities. Once more, as the course progressed both the students and I shared SL related resources from the blogosphere and the Internet in general.

5.3.3. MIL08 TIME AND SPACE

The course ran from November 10th through December 15th 2008, and I offered the students scheduled, but optional activities from November 6th, which meant that there were online activities for six weeks. As in MIL07, the preparation week included a two and a half-day face-to-face seminar, and at the seminar, three hours were dedicated to introducing the pedagogical potential of SL and the course. Contrary to the MIL07 cycle, the lecture did not cover 3D virtual worlds in general[49], but was mainly focused

[49] The MIL07 lecture had been recorded and offered to the MIL08 students as part of the general resources.

on SL drawing on the experiences that the students and I had in the MIL07 case. The hands-on part focused on the avatar phenomenon and basic skills in the SL viewer. Once again, the students had to choose between two analytical objects, and regardless of choice, the expected student workload would be 110 hours.

As previously, the study activities took place in three different locations: at the seminar, at the participants' workplaces, and in the participants' private settings. Scheduled activities inworld took place between 8-10 PM, except for Fridays and Sundays between 3-5 PM. The time slots were based on my experience from MIL07, and already in September 2007, I asked potential MIL08 students to comment on these[50]. I explained how sessions in the evenings would better enable us meeting my inworld colleagues, but I also offered to hold a couple of sessions during the day, if the evening slots proved to be difficult for some students. At the seminar, I repeated this offer, but all agreed that evening slots were preferable. This time around, I also asked the students to bring their own computers for the hands-on part, but maintained that they would have to create the SL account in advance. Further, based on the confusion some of the MIL07 students had experienced on the Orientation Island (OI), I created an alternative[51] avatar, Siiram Savira, and left her on OI, so that I could help there if needed. In effect, I only met one MIL08 students on OI, and I quickly helped her to teleport onto the main grid (MIL08-Obs-09/11-2008-Book2).

5.3.4. MIL08 PARTICIPANTS

One main facilitator (me), two guest teachers, and twelve[52] students participated in the course. As in the previous course, the profile of the students matched the general profile of MIL students, with ten students working in the educational sector, and two students working in the business sector. All students were working with teaching or training at some level in their organisations. Eight students were following a regular study mode, and two students were enrolled full-time. One student returned from a study break, another student enrolled into the programme for the first time, and therefore they did not belong to the community in the same way as the rest of the students. Once again, all participants were considered to match the profile of being relatively tech-confident in terms of general ICT, the majority did, however, not have any experience with SL or other virtual worlds/games.

[50] I asked through an online posting in the FC-environment.

[51] Once avatars left the OI, they were not able to go back. Hence, the need for a new avatar.

[52] Four students, who had chosen to follow the course on the other analytical object, Global Conflicts Palestine, were interested in SL as well, and they participated in some of the activities ad hoc. However, they have not been included in the data used in this study.

5.3.5. MIL08 VIRTUAL LEARNING ENVIRONMENT

Again, the virtual learning environment consisted of a combination between FC and SL. However, contrary to the MIL07 case there were numerous study activities in both environments. The arguments for maintaining the use of FC were the same as in MIL07, but in the MIL08 cycle, I also chose to design the FC-environment differently, as depicted in figure 5.7. below. In MIL08 the FC forums were:

- MIL07 (M4C1) Avatarer – conference used for presentation of the participants' avatars
- SL tutorials – folder with tutorials
- Urls og SLurls – folder with links related to SL information, journals and links pointing directly to places inworld (so-called SLurls)
- SL besøg – folder with information regarding planned visits
- SL ressourcer – folder with resources, mainly research papers and other texts on SL
- SL – Didaktik og målgrupper, Orientering og Navigation etc. (blue speech bubble icons) – conferences for discussion of the five mandatory sub-topics
- Main conference (below the bar) – the meta conference for the SL course used for general communication between the teacher and the students

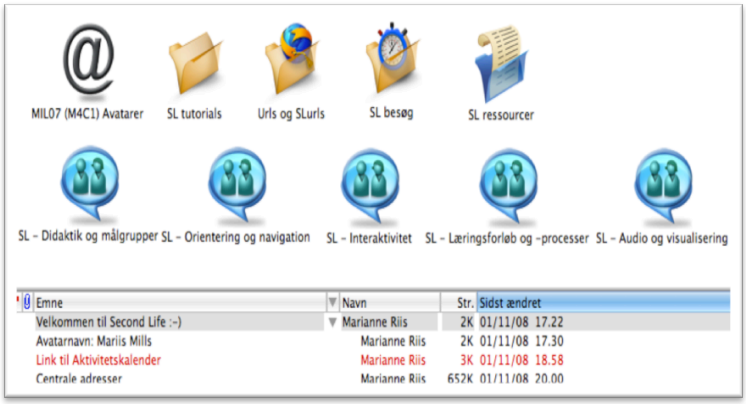

Figure 5.7. FC in the MIL08 cycle.

From January 2008, the MIL programme started renting an office space and the holodeck from the MIL07 cycle on the Danish WD Island. Whereas the office, hardly ever was used, the holodeck was used as inworld "home" from the onset of the MIL08 course. The holodeck was placed high up in the air above the WD Island to ensure some privacy, and I asked the landowner, Doctor Asp to develop an additional setting making it possible to shift between four settings as depicted in figure 5.8 and 5.9.

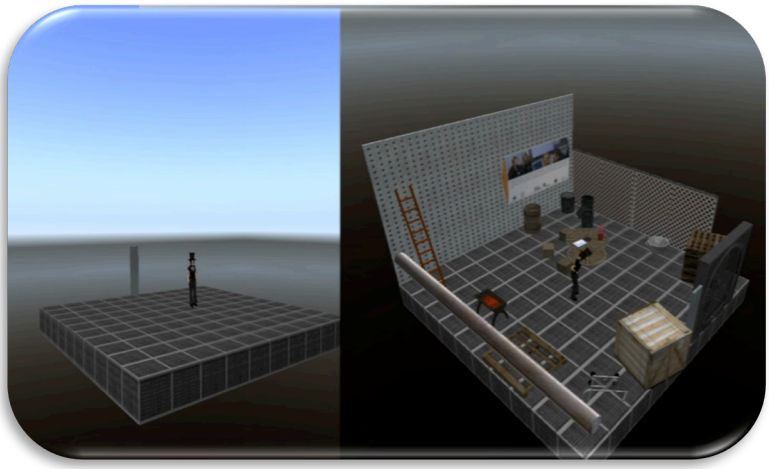

Figure 5.8. MIL08 holodeck – setting 1 and 2.

Figure 5.8. left shows setting 1, which was empty, and this was used for demonstrations mainly. Setting 2 on the right shows the "default" setting, which was used on a daily basis as a place to meet and hang out.

Figure 5.9. MIL08 holodeck – setting 3 and 4.

Figure 5.9. left shows setting 3, which was a meeting room setting, and this was mainly used for didactic design discussions. Finally, a bar type setting for socialization, is shown on the right. As in the MIL07 cycle, the holodeck was also used as a "safe haven", whereto the students could teleport in case they wanted to get away from some

unwanted situation, and the place was used to change avatar appearance and practice different skills.

As previously mentioned, I decided to organize the students as one big group having them all committed to discuss the mandatory sub-topics on a collaborative basis. As in the MIL07 cycle, the role of the teacher in FC was to facilitate and moderate the asynchronous discussions, but in SL, the role of the teacher changed to that of a facilitator and technology steward.

5.3.6. MIL08 LEARNING ACTIVITIES

As seen from a curricular perspective, the objective of the course was still not for the students to learn about SL per se, but based on the findings from the MIL07 cycle, I decided to develop different types of activities to enhance inworld engagement and participation. As we saw in chapter three, Wenger (1998) identifies four central components of a community of practice that each point to a way of learning. While these four components are inherent in the abovementioned design principles, I decided to amplify these different ways of learning through design of specific activities in order to accommodate the research cycle's problem solving interest (PSI). Additionally, the MIL07 cycle had documented that the students had been struggling with SL as medium, and difficulties in mastering SL could pose a general barrier to learning.

Accordingly, the activities were designed to meet a threefold objective:

1. Support the students' mastery of the medium/VLE
2. Support the students' mastery of the subject matter
3. Support the cultivation of an inworld community of practice

An overview of the activities is shown in table 5.4. below.

MIL08 – overview of inworld activities		
SL activity	**Description**	**Main objective**
Get-off-to-a-good-start (n=7)	Sessions focused on learning basic SL skills such as movement, communication, orientation, camera control, change of appearance, and the use of objects.	Mastery of the medium Facilitate development of inworld identity and community Support inworld practice and negotiation of meaning

Continues next page ...

Didactic Design Discussion (n=4)	Sessions focused on discussion of subject-matter topics based on course literature and the students' FC-discussions	Mastery of the subject-matter Facilitate development of professional identity and community Support inworld practice and negotiation of meaning
Tour (n=7, included in Get-off-to-a-good-start)	Sessions focused on exploring SL, discovering places and potentials relevant to the subject-matter and the students' work-related interests	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Visit (n=5)	Sessions focused on meeting experienced SL users: show & tell, discussing their particular SL practices related to the subject-matter	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Your tour (n=2)	Sessions initiated and facilitated by the students focused on the subject-matter and their particular, work-related interests	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Building Class (n=4)	Sessions focused on learning how to build and manipulate inworld objects	Mastery of the medium Facilitate development of a professional inworld identity Facilitate inworld practice and negotiation of meaning
Friday Bar (n=2)	Sessions focused on socializing and exploring some of the more fun features of SL	Contribute to the development of the community
Christmas Celebration (n=1)	Session focused on socializing and evaluation of the course	Celebrate our joint enterprise and evaluate the course

Table 5.4. Overview of SL activities implemented and studied in the MIL08 cycle.

Get-off-to-a-good-start sessions were designed to remedy the challenges the students were facing as newbies focusing on the mastery of the medium and the establishment of inworld identity and community. The MIL07 cycle, had, however, also revealed that the students were challenged by several topics related to the subject matter, especially ideas and concepts that were particular to this kind of virtual learning environment, e.g. presence, immersion, and embodiment.

The *Didactic Design Discussions* were designed to address such issues, and to facilitate the students' participation and reification as newcomers in this particular domain.

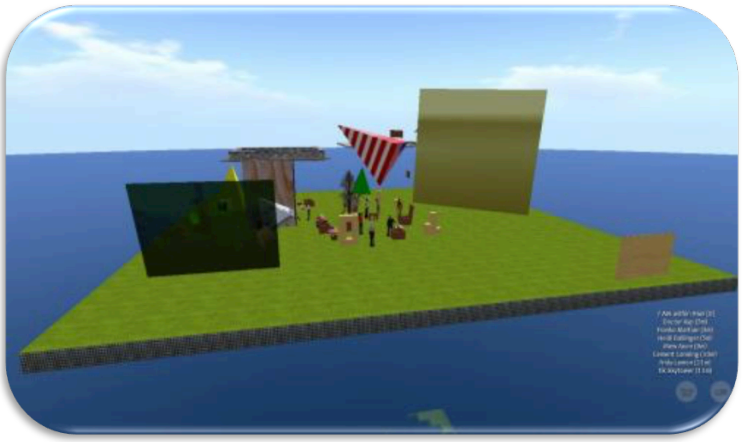

Figure 5.10. MIL08 Building Class.

Tours were aimed at enhancing the students' awareness of the possibilities and places inworld. Tours were typically the last activity in the Get-off-to-a-good-start sessions, and these tours also provided for more informal and fun conversations and activities, thus playing an important role in the community building. As part of the tours, two particular venues were recommended as additional activities: Science Friday (a RL American radio talk show streamed live into SL once a week) and Metanomics (a SL-based American TV show streamed live out on the web once a week). Both venues were known for their very active, text-chatting audiences.

Visits were field trips to meet some of my inworld colleagues, to see their places and hear about their inworld practices. In the MIL08 case the visits included:

- Claus Uriza – Danish music editor, metadata specialist, and owner of SL based Pop Art Lab
- Phelan Corrimal – Canadian President of Rockcliffe University Consortium and one of the lead figures behind the annual Virtual Worlds Best Practices in Education conference
- Gunhild Soderstrom & Bitterleaf Menges – Danish Professor of Philosophy from University of Southern Denmark and her in-world technician/builder
- ArminasX Saiman – Canadian entrepreneur and owner of the SL based company Electric Pixels
- Dera Kit – Israeli Professor and Head of the Information Systems Program at the School of Management and Economy, Tel-Aviv-Yaffo academic college

The purpose of the visits was to show the students other professional uses of SL, discuss cross-cultural and in most cases international differences in education and business, and provide a sense of the global community situated in SL.

Your Tour was my encouragement to the students to facilitate tours on their own, based on their specific, work-related interests. The Building Class sessions were designed and facilitated by two Danish inworld colleagues, Doctor Asp and Heidi Ballinger, and these sessions were aimed at giving the students insight into basic building techniques and an enhanced understanding of the reification possibilities in the medium. *Friday Bar* is a well-known activity for on-campus students, and my goal was to recreate these informal gatherings to support the formation of the community. Finally, the *Christmas Celebration* provided an opportunity to wrap up the course in a relaxed and fun way.

Figure 5.11. MIL08 class discussing embodiment.

As already mentioned, all 25 activities, but one, were optional. To allow for flexibility most activities were repeated several times, and were placed on different weekdays, and as many dates possible were announced from the beginning of the course enabling the students to manage their time[53]. I asked the students to participate in minimum one activity to ensure that they experienced the sense of a designed activity and of "being together". Based on the experience from MIL07, all sessions were set for two hour duration to allow for plenty time to start with audio and other technical rehearsals. To further enhance the sense of community, an inworld MIL group was created, and the students were asked to join it. The communal group would allow for private group chat (figure 5.12. below), and provided a means for me to send shared inworld messages and note cards that would be stored.

[53] One planned visit was cancelled and replaced on another date, and since "Your Tour" was based on the students' voluntariness, these were announced ad hoc.

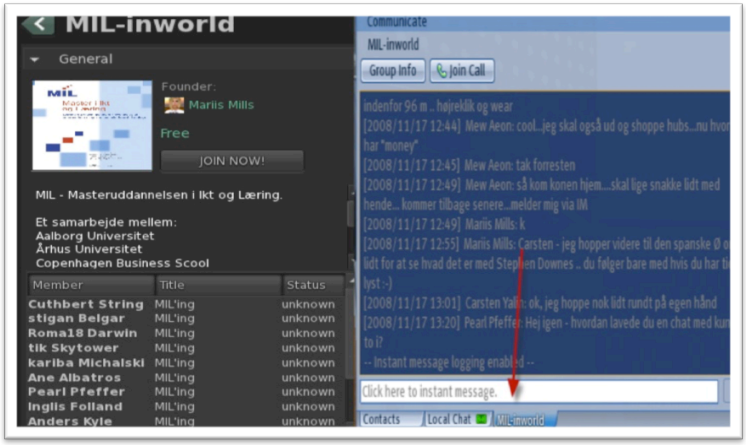

Figure 5.12. MIL08 group and chat.

Typically, note cards contained brief activity descriptions and landmarks to places, and these stored messages also allowed for students, who were unable to participate in the actual session, to catch up later at a time of their convenience[54]. Moreover, joining and activating the group would mean that each participant got the tag "MIL'ing" showing affiliation[55] to the programme over the avatar's name as shown in figure 5.13. below.

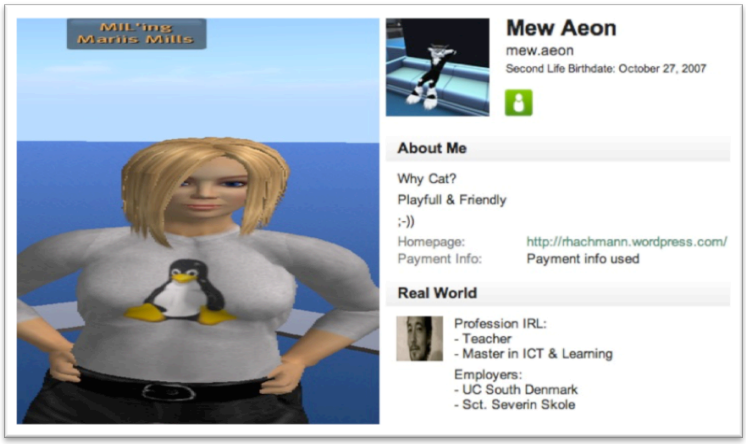

Figure 5.13. MIL tag and user profile.

[54] The SL system only allows for group messages to be stored for 14 days, however, once the user opens a message it is automatically stored in his/her inventory.

[55] The tag "MIL'ing" is an affectionate Danish nickname, we generally use for enrolled students, especially newcomers.

Additionally, the group enabled us to voice-chat privately, and messages sent to the group would be forwarded to the e-mail account the students had signed up with. All students were asked to "friend" the teacher and each other. "Friending" each other inworld, would enable participants to see each other online, initiate private chats, and to locate each other. Further, all students were given the sum of 500 Linden Dollars[56], and were encouraged to fill out their inworld profiles with photos of their avatars (figure 5.13. right side).

Finally, as mentioned, when my PhD process officially commenced in January 2008, I decided to maintain a research blog, and in the MIL08 cycle I blogged about several of our inworld experiences. These blog-posts also allowed the students to catch up on events and activities they had been unable to attend.

5.3.7. MIL08 LEARNING EXPERIENCES

In MIL08, there were 25 scheduled activities, and with 144 attendees out of 300 possible, the overall attendance was 48%. Detailed student attendance[57] in the scheduled MIL08 in-world activities is shown in table 5.5. next page, and despite the fact that all 25 activities, but one, were optional, it shows that the MIL08 students chose to participate in several of the activities.

The most popular activities were the Didactic Design Discussions and the student-led Tours – both activities with a clear focus on subject matter content. Especially, in relation to the discussions, the students had to learn a new way of communicating while "in class". In the beginning of these sessions, I used voice and asked the students to use the text-chat to comment and pose questions while I was talking. Later in the sessions, I would "open the mic" for everyone. For the majority of the students, it seemed highly impolite to interrupt even by writing, and very confusing to follow two different modes of communication simultaneously (MIL08-Obs-27/11-2008-Book2; MIL08-Obs-30/11-2008- Book2). Only after I stressed that the text-chat was my best way of sensing their active participation while talking, did the students start to use the text-chat beyond mere affirmative statements such as yes or no. Once the students became more confident with this new way of communicating, it became the best way to handle the problem of turn taking in this kind of environment (MIL08-Obs-04/12-2008-Book2; MIL08-Obs-07/12-2008-Book2).

[56] Uploading photos, i.e. of the avatar for the user-profile, costs money in SL.

[57] Again, sessions in SL ran for two hours, but not all students attended from the beginning and/or throughout the sessions. Numbers are based on attendees in the first half hour, and should be regarded as an estimate.

MIL08 – Student (n=12) attendance in inworld activities		
Activity	Number of students (total)	Attendance
Get-off-to-a-good-start, incl. Tours (n=7)	23	27%
Didactic Design Discussion (n=4)	42	87%
Visit (n=5)	37	62%
Your tour (n=2)	16	67%
Building class (n=4)	14	29%
Friday Bar (n=2)	2	8%
Christmas celebration (n=1)	10	83%

Table 5.5. MIL08 – Student attendance in inworld activities.

Visits to meet other inworld educators and entrepreneurs were also quite popular. In relation to mastery of the medium, it is interesting to observe that relatively few of the students chose to participate in the Get-off-to-a-good-start sessions. When asked specifically about this, in an inworld session by the end of the course, the students explained that a) some of these sessions collided with other activities in the previous module 3, and b) they had not fully realized, in the beginning of the course, how difficult and time consuming it would be to learn to master the medium (MIL08-Obs-14/12-2008-Book2).

Two students chose to conduct tours: one student planned a tour to an island called Genome Island to discuss the use of SL in relation to teaching genetics, and one student chose to show us his workplace's inworld presence, the Danish cement company FLSmidth[58].

As for the Building Classes, only one student participated in all four sessions. Some of the other students explained that while learning how to build was a positive feature of SL, they had chosen to prioritize other activities mainly because there seemed to be little point in acquiring this kind of skills (MIL08-Obs-14/12-2008-Book2).

[58] The mention of the RL company name is used with permission from the student in question.

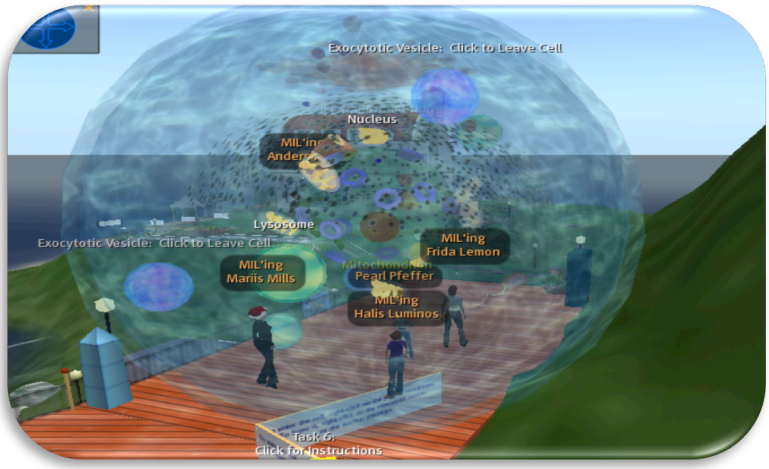

Figure 5.14. MIL08 on Genome Island as part of Your Tour.

Friday Bar sessions were a complete failure, and after the second session, I decided to cancel the remaining two. When asked about this, the explanation from the students was quite clear: "Beer tastes better in RL", but other than this humours aspect the students clarified that their priorities were to favour subject-matter related activities over the more social (MIL08-Obs-16/12-2008-Book2). In spite of the MIL08 class' reluctance to participate in the more social oriented Friday Bar sessions, the class was in general highly social. The students often went inworld together, they helped and supported each other with different features and skills inworld, they participated actively in the inworld discussions, and for the Christmas celebration they collaboratively rewrote a Danish Christmas carol, so that it matched their course experience. In fact, as we shall see in the following section, the MIL08 students highlighted the social aspect of the course and SL many times in their course evaluations.

Even though there still were problems with the technology, and the learning curve still was considered very steep, the implementation of various inworld activities was a success in terms of increased inworld student engagement and participation. On the other hand, because the MIL08 students were equally active in the FC-environment, consensus by the end of the course was that despite this success, the overall level of activity had been too high, and it was suggested that future iterations of the course should reduce the number of activities. To this end it is worth noticing that while almost all inworld activities were optional, many of the students expressed frustration if they were unable to attend certain sessions because they felt they missed out on "important stuff", and furthermore it is important to remember that the students spent many hours inworld besides the scheduled sessions (MIL08-Obs-16/12-2008-Book2).

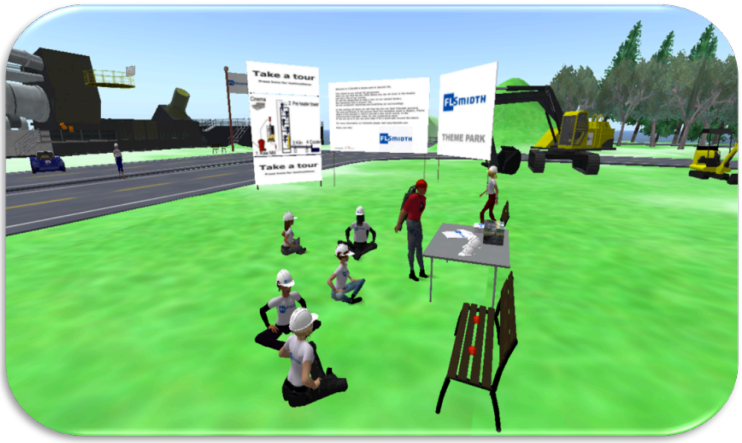

Figure 5.15. MIL08 visiting FLSmidth as part of Your Tour.

Moreover, the students pointed to the paradox of being expected to spend time inworld, while the dissemination of their efforts was expected to take place in FC. In other words, the students called for better opportunities to use SL in relation to all aspects of their study work such as it had been the case in the Your Tour sessions (MIL08-Obs-16/12-2008-Book2).

5.3.8. MIL08 LEARNING OUTCOME

All 12 students passed the course, but for one student this only happened after he was asked to elaborate on his analysis in order to meet the qualitative demands. Even though there were fewer students in this course than in MIL07 cycle, and there were many more activities in SL, the number of postings in FC increased by 10 to 368. However, the majority of these postings were placed in the main conference and were mainly of organizational character such as stating whether or not a student expected to participate in an activity. Nonetheless, 119 postings were directly related to the subject matter, which shows that the mean for participation in FC discussions for MIL08 students was higher than for MIL07 students. The main objective of the course was for the students to learn how to conduct a Didactic Analysis, and again the students managed to learn this. The students also learned about SL, and their analyses reflected the changes in the course design insofar as for the majority of the students, their approach to SL indicated knowledge better grounded in inworld practice compared to MIL07.

By the end of the course, I repeated the curricular learning objectives and encouraged the students to reflect upon their learning outcome and the course. One student suggested that they also tried to answer three specific questions:

1. What is the most important thing you learned?
2. Has it been hard?
3. How has this course been different from other MIL courses? (MIL08-FC-main conference-December)

Nine students chose to reflect on their leaning outcome, and besides agreement on having learned the curricular goals, it is interesting to observe, what the students referred to as most important, and often unexpected (to the students) outcomes. The avatar and the general course design were mentioned in relation to learning:

> I think the most important gain has been that we have been active and participating – we have tried what it means on our own body/avatar. (MIL08-FC-main conference-December)

> I've really learned about the importance of the social aspect in learning. In SL you can do a lot on your own (…), but it is the moment when you meet other "living" avatars in there that you really start to reflect upon the medium and the content of the virtual world. Something happens in terms of real interaction and creation of meaning, the meeting with the virtual world becomes meaningful. (MIL08-FC-main conference-December)

> Usually I approach an assignment from theory to practice. As a new experience, I have learned to deduct from practice to theory. And what has made this possible? Is it because SL is action oriented, is it because the design is dialogic, is it because I've been augmented? Probably all three. (MIL08-FC-main conference-December)

The students also reflected on the role of the teacher in an environment such as SL:

> I have learned how an educator can use SL. By being a student and feeling on my "own body" how different learning activities work. From apprenticeship in the building class, our social contextualized dialogues in the holodeck, to single cognitive learning processes at Metanomics, where knowledge simply "floats on to your hard-disc". What surprises me is that they all work. (MIL08-FC-main conference-December)

> The course has given me a good impression of what it takes to be a teacher in a virtual world and how you can use it as a learning environment. In this way, the course has been exemplary in its didactic design with goals and a frame for activities, and that has been an important precondition for my positive experience of SL. (MIL08-FC-main conference-December)

Further, there were important insights in relation to future possibilities of approaching and using technology and SL:

> The most important thing I've learned is to never dismiss anything as "not fit for teaching" until I've tried every aspect of it. (MIL08-FC-main conference-December)

> I have gained many ideas to possible learning environments, but I have also realized that a lot is still lacking before it becomes an environment, I would use in my own teaching. (MIL08-FC-main conference-December)

The second question on whether the course had been hard, may strike an outsider as being somewhat peculiar, however, in this context it made perfect sense. As previously mentioned, up until this course, the students had been accustomed to asynchronous teaching and learning in the MIL programme. The change to a synchronous environment affected the students' individual study habits, and not least, the way they interacted with fellow students and the teacher(s). In this respect, this question became closely connected to the third question on the difference compared to other MIL courses. All students were struck by the steep learning curve and by how this affected them personally and as learners. The amount of time, the students had been using in the course, especially in relation to their mastery of SL, was frequently mentioned:

> The entry barrier in SL is high. It takes a lot of time before you feel safe in the environment, to learn to navigate, to understand features and the interface, to begin to understand the world on its own premises – and it takes time to gain experiences. (MIL08-FC-main conference-December)

> As you all know, this course has been very time demanding, but the worst part has been the complete impotence in terms of your own technical shortcomings. I've experienced an almost infantile temper whenever the navigation didn't work as intended and you missed following the others in the class or when you ended up wildly floundering and stuck inside a wall of some sort. But there have been lots of motivating factors to continue the struggle. (MIL08-FC-main conference-December)

> The disadvantage of SL is as already mentioned that it takes quite a lot of time to become confident in navigating, buying new hair and new clothes etc. If Mariis hadn't guided us, I think, I would have given up. Therefore, one lesson learned is that people like us who are already very busy, need a guide – or we will lose our patience. If we had done this for leisure, then things would probably be different, and if we were 30-40 years younger, everything would probably be more intuitive. (MIL08-FC-main conference-December)

On the other hand, the social aspect of the course had played an important role:

> The SL course has more explicitly put social interaction in play. There is no doubt that the sense of community has been the frame for the activities in SL. (MIL08-FC-main conference-December)

> I've been motivated and engaged in a different way than usual. I think the explorative, the social, and the visual parts play a huge role here. It has been a really good experience to meet in the Holodeck to discuss theory with each other – instead of just writing about it as we usually do. The course has had more of a social character and that has been a good way to initiate dialogue and joint experiences with other students that your "regular group members". (MIL08-FC-main conference-December)

Further, the dialogic perspective and the role of the teacher were highlighted in relation to the course design:

> For me the biggest difference has been the continuous dialogue. Personally, I learn best through conversation and by listening to others. To have the theory elaborated, and the talks Marianne made in the holodeck, has been really good and inspiring in terms of investigating theory and inworld. In contrast to other courses where we spend much time in our groups, it has been really good that we have been so many to discuss different theories and topics. (MIL08-FC-main conference-December)

> The difference is not just the amount of time, it is also about the way she [Marianne] communicates – you can goof around as much as you want to – there is tolerance, care, humanity, and you sense that both in fc and in sl. (…) And the course has been very oriented towards practice. You have been able to fool around with technical facilities and play with the medium. That has fit a practitioner like me really well. (MIL08-FC-main conference-December)

> It has been nice to feel "taken care of" as a student. I've been thinking about it, and here is what I think: The more interest from the teacher, the more activity from the students. You feel obligated as a student, when the teacher spends so much time. This opens for a discussion of how much time a teacher needs to be able to "nurse" his/her students? (MIL08-FC-main conference-December)

Once again, new lessons were learned from this second research cycle both in terms of the course design and the use of SL in a pedagogic setting.

5.3.9. MIL08 REFLECTIONS AND DESIGN CONSEQUENCES

The research interest in the MIL08 case was to further study SL as virtual learning environment and specific activities' impact on this pedagogical community. Based on a more radical remediation strategy, I decided to reform the design that had been used in

the MIL07 cycle. The main change was a design of eight different types of activities that resulted in 25 scheduled inworld sessions. The activities were designed to facilitate the students' mastery of the medium and the domain, and to promote the cultivation of an inworld community. The results were very positive insofar as the degree of inworld participation increased considerably compared to MIL07. Subsequently, the quality of the students' experiences with SL improved, and so did the quality of their Didactic Analyses, because they reflected knowledge better grounded in inworld practice.

However, while the design strategy proved very successful in terms of amplifying the students' engagement and participation both inworld and in FC, the general activity level had paradoxically been too high for the community, mainly because it challenged the flexibility of the study programme. Further, the dominant role that the FC-environment still played in the course was criticized and the students called for better use of SL in relation to all study activities, incl. dissemination and assessment in future iterations of the course.

Again, by means of using the three polarities by Wenger, White & Smith (2009), it is possible to describe and reflect upon how the MIL08 students responded to the design of the course and the adoption of SL.

MIL08 students' responses in relation to rhythms (togetherness and separation)

In this MIL08 course, the students and I clearly succeeded in establishing a rhythm, and there were many indications of sustained mutual engagement during the course. The community we created was very vibrant, and the interactions oscillated between SL and FC. Nonetheless, the community beat was too fast, and the students reported of feelings of being overwhelmed. There seemed to be a tendency for the "community time" to take over the individual time necessary to process all the interaction and to read the assigned literature. Other design features such as the use of the MIL holodeck and the creation of the MIL group with the "MIL'ing" tag contributed positively to the promotion of "community space" inworld. By design, in this MIL08 course, both togetherness and the general lack of separation were based on the combination of asynchronous FC discussions and synchronous activities in SL.

MIL08 students' responses in relation to interaction (participation and reification)

Despite the fact that there were plenty of opportunities for inworld participation in the MIL08 course, the possibilities for inworld reification was less appealing to the students. Reification through the production of virtual and conceptual artefacts can manifest itself in many different forms (e.g. words, concepts, documents), and in SL there is a unique possibility of creating 3D virtual objects. Contrary to MIL07, the MIL08 course included two types of activities designed specifically with 3D object

reification in mind: the Get-off-to-a-good-start sessions and the Building classes. However, as we have seen, the attendance in those sessions was low compared to the attendance in the more conventional dialogue-based sessions. In effect, the MIL08 students mainly chose to reify their shared experiences in the FC environment. Nonetheless, the students' feedback indicated that their practice reflected the course design (in terms of dissemination through three written posts in FC) rather than the technological possibilities.

MIL08 students' responses in relation to identities (individuals and groups)

The MIL08 cycle provided many opportunities for togetherness in SL, and as a consequence the avatar-mediation – both as an individual and social phenomenon - was discussed vividly throughout the course in both FC and SL. As we shall see in chapter six, the students' impressions of and experiences with the avatar continued to cause both ontological and pedagogical challenges in MIL08.

In the MIL08 cycle, the three polarities revealed more in terms of adoption of SL, and again they highlighted the influence of the pedagogical design. Summing up, the findings from the MIL08 cycle showed that a revised design strategy, with a stronger focus on design for cultivating an inworld community of practice, in many ways was a success. Paradoxically, the successful adoption of SL became a problem in terms of flexibility, and new design challenges called for action. Consequently, I decided to continue the study of SL's general impact, reduce and further refine the activities, but also to develop, implement, and evaluate a new assessment method better aligned with the virtual learning environment in the next research cycle.

5.4. THE MIL09 CYCLE

In this section, I present the actions taken in the third research cycle, where the research interest was to study SL as VLE, the impact of different activities, and a new assessment method. The problem solving interest in this research cycle was to design, implement and evaluate an inworld assessment method as a means to solve the discrepancy between participation and reification in SL. The chosen design strategy continued to be respectful, but with more radical elements, the inworld assessment method being the most radical. Again, the design was guided by principles for cultivation communities of practice, and as we shall see, I developed two more principles in this research cycle.

5.4.1. MIL09 RESEARCH INTEREST AND DESIGN STRATEGY

The third research cycle was conducted in the late fall of 2009, and the research interest was to continue the study of SL as virtual learning environment, and different activities and their general impact on this specific community. Furthermore, I decided to implement and study a new assessment method, and finally I invited a co-facilitator, Mew Aeon, for some of the activities. My main argument for inviting Mew as co-facilitator was to see if we could ease the students' newbie experiences by offering more individual guidance as technology stewards. Based on the two previous research cycles, I had experienced how difficult and time consuming it was to act as both facilitator and technology steward when running the course alone. Additionally, Mew had previously shown a strong interest in SL, especially in terms of building inworld learning designs and activities, and he is highly inspired by situated learning and the communities of practice framework in his work as an educator.

Figure 5.16. My co-facilitator Mew Aeon.

Based on the experience from the MIL08 cycle a specific problem solving interest (PSI) was identified as summarized in table 5.6.

Research cycle	Research interest (RI)	Problem solving interest (PSI)
MIL09	Study SL as VLE, and the impact of activities, and a new assessment method on the MIL community.	PSI2: How can design of an inworld assessment method solve the problem of discrepancy between participation and reification in SL?

Table 5.6. MIL09 Research interest and problem solving interest.

Figure 5.17. below shows the highlighted elements in the design model for this cycle.

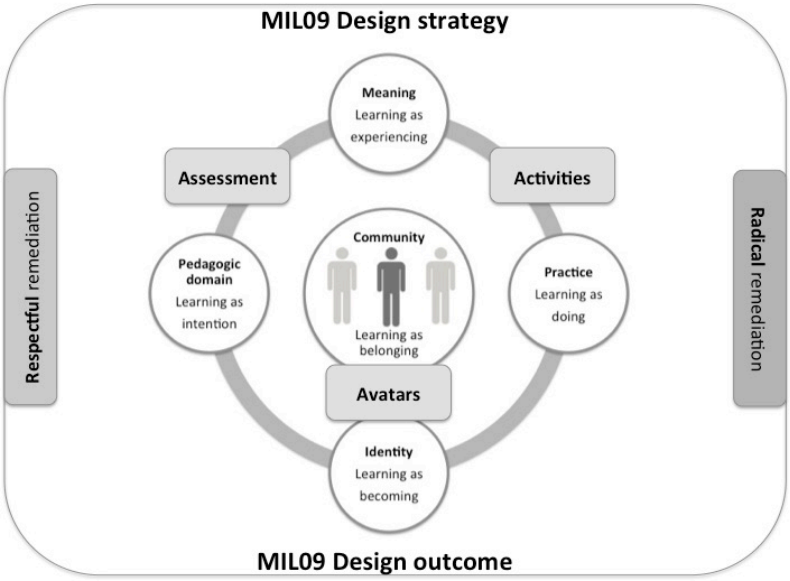

Figure 5.17. The MIL09 cycle.

As in MIL08, the deployed design strategy was aimed at reforming prior practice, and in the MIL09 cycle, this mainly concerned the development of new assessment method despite the fact that the main learning objective (and goals) remained unchanged.

Hence, to pass the course, the students could now choose between:

1. writing a minimum of three posts reflecting their Didactic Analysis as in previous courses, or

2. presenting their Didactic Analysis synchronously inworld

Furthermore, presenting their avatars and reflecting on their learning outcome also became part of the assessment criteria. Activities developed in MIL08 were either abandoned or refined, and again I choose to put emphasis on respectfully remediated activities in the beginning of the course, while focusing more on the NpIRL aspects when the students had gained more overall confidence with the medium.

Once again, based on Wenger, McDermott & Snyder's (2002) ideas about cultivating communities of practice and my additions, the following principles summarises the overall MIL09 design strategy:

1. **Design for evolution** – the activities I designed for MIL09 were once more aimed at facilitating the students' mastery of both the medium and of the subject matter/domain, and these activities were designed to facilitate a progression in the course. However, in this case, I decided to reduce the number of inworld activities, and there were qualitative changes as well.
2. **Open a dialogue between inside and outside perspectives** – while there were positive experiences in both MIL07 and MIL08 in terms of meeting other professional SL users, the attendance in these sessions in MIL08 had shown that the students prioritized other activities, so I decided to reduce the number of visits. Meanwhile, inviting Mew to co-facilitate can be seen as another way of opening up for new perspectives.
3. **Invite different levels of participation** – again the students were encouraged to participate in as many activities as they wanted and at any time.
4. **Develop both public and private community spaces** – in MIL09, we had an entire island at our disposal, and the MIL holodeck was hardly used. Again, creation of an inworld MIL group enabled us to chat privately when we were out exploring the public grid.
5. **Focus on value** – the activities were clearly designed to add value to the students' mastery of both the medium and the subject matter. The overall course design was naturally aligned with the curricular goals, but by changing the assessment method, I aimed at creating a stronger connection between the medium and the subject matter/the domain.
6. **Combine familiarity and excitement** – as in MIL08, the focus on both respectful and radical remediation in relation to places and practices inworld were designed to facilitate both familiarity and excitement in terms of new perspectives on the domain.
7. **Create a rhythm for the community** – inworld activities were designed not only to support negotiation and creation of meaning, but just as important to promote a sense of liveliness, a rhythm of participation. Compared to MIL08, in MIL09 I aimed for a more focused participation in SL, thus hoping the community rhythm would find a more acceptable level.

8. **Support avatar exploration** – besides focusing more explicitly on the avatar phenomenon in the introductory f2f-workshop, I also added presentation of the students' avatars (in FC) to the course requirements, thus signalling its importance. The Newbie Night inworld sessions dealt not only with manipulation and creation of objects, but also with altering the avatars appearance and learning how to control the avatar's behaviour. Finally, focus on more theoretical aspects related to the avatar was included in the didactic discussions.
9. **Promote inworld participation** - in this MIL09 cycle, I increased the number of mandatory in-world sessions with one. At the same time, I made it clear that the students were not expected to spend significant time in the FC-environment.

To further support inworld activities in this cycle, I developed two new design principles.

10. **Promote inworld reification** - I offered the students the choice of dissemination and assessment through SL. Further, to scaffold the students' mastery of the medium and thus their abilities to disseminate though SL, Mew and I focused on designing the different activities, and our different learning spaces with this purpose in mind.
11. **Support newbies through inworld stewarding** – Mew and I focused on creating a safe learning environment where the students were fully accepted as legitimate peripheral participants, also in relation to technological mastery. As such, one of the two activities, the students were required to participate in had to be a so-called "Newbie Night" in this cycle.

5.4.2. MIL09 PEDAGOGICAL DOMAIN

The curricular setting had not changed. Even so, after consultation with the coordinator of the module, Professor, Birgitte Holm Sørensen, and based on the findings from the previous research cycles, I decided to maintain the objective of the course (to learn how to conduct a Didactic Analysis), but more importantly, I decided to change the assessment method, making it possible for the students to disseminate their findings by performing their didactic analyses in SL, instead of in the FC-environment.

The print compendium of texts related to ICT in relation to Didactic theory and design was revised so that it also included literature relevant to virtual worlds, and again many optional SL texts were suggested. A small written guide on how to get off to a good inworld start was provided. However, the students were also told that newbie guidance would take place inworld, and the students were required to participate in minimum one of the sessions called "Newbie Nights" and in one of the "Didactic Design Discussions". The Picasa directory was replaced with inworld note cards focused on

educational places. The Google calendar was also abandoned and replaced with a calendar in the general course syllabus.

5.4.3. MIL09 TIME AND SPACE

The course ran for six weeks from November 2nd through December 16th 2009, and one of the main changes in comparison to the previous courses was that my co-facilitator, Mew joined us at the face-to-face seminar. Again the students had to make their final choice regarding analytical object at the seminar and they were still expected to study for 110 hours. I conducted a short lecture on the educational potential of SL, while Mew spoke of his personal experience with education in SL, and we both focused on the avatar phenomenon and basic skills in the hands-on part of the three-hour workshop. Before the seminar, the students had been asked to create their accounts, and they were given specific information about the avatar creation and how to proceed on the Orientation Island (OI). I had also created yet another alternative avatar, Riis Novelli, who resided on OI, but he was never used in that context. As previously, the study activities were situated in three different locations: at the seminar, at the participants' workplaces, and in the participants' private settings, and again scheduled activities inworld took place between 8-10 PM, except for Sundays between 3-5 PM.

5.4.4. MIL09 PARTICIPANTS

One facilitator (me) and one co-facilitator, Mew, and eight students participated in the course. In MIL09, the profile of the students changed insofar as all eight students were working in the educational sector. Six students were following a regular study mode, whereas two students were full-time students. Again all participants were considered to match the profile of being relatively tech-confident in terms of general ICT, and while the majority still did not have any experience virtual worlds/games, one participant had experimented a bit with SL before the course in relation to his job.

5.4.5. MIL09 VIRTUAL LEARNING ENVIRONMENT

As in the previous research cycles, the virtual learning environment consisted of a combination of FC and SL, but contrary to the two previous research cycles, the MIL09 course prioritised activities in SL. In anticipation of less activity in the FC-environment due to the changed assessment method, I decided to reduce the number of forums in FC. This decision was also based on the MIL08 students' critique of discussing in predefined topic-related forums[59].

[59] In MIL08, there were no postings in the forum called "Interactivity". Nonetheless, they did discuss interactivity; they just chose to do so in relation to some of the other topics.

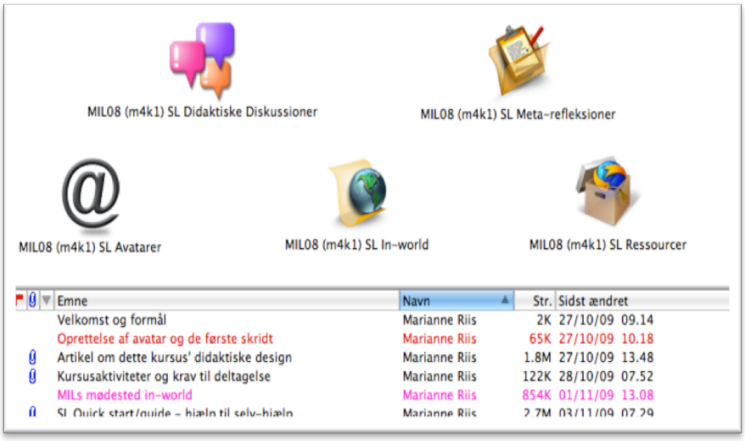

Figure 5.18. FC in the MIL09 cycle.

In the MIL09 case, the forums for FC activities were:

- MIL08 (m4k1) SL Didaktiske Diskussioner - dedicated to discussions
- MIL08 (m4k1) Meta-refleksioner – dedicated to the reflections the students were asked to do by the end of the course
- MIL08 (m4k1) Avatarer – dedicated to presentation of participants' avatars[60]
- MIL08 (m4k1) SL in-world – dedicated to information and questions regarding in-world activities
- MIL08 (m4k1) SL Ressourcer – a folder containing information and SL literature
- Main conference (below the bar) – dedicated to general communication between the teachers and the students

In the MIL09 cycle, colleagues from the Polish Maria Curie-Sklodowska University, with whom I had collaborated in the COMBLE project (cf. chapter one), kindly let us use their auditorium and sandbox on their island, Second UMCS, and this meant that the MIL holodeck was hardly used. The new location provided Mew and I with better opportunities to experiment with the "classroom" setting. Figure 5.19. below shows the auditorium as it looked when my COMLE colleague, Heilyn Camacho (AAU) and I first arrived on the Second UMS Island in the summer of 2009.

[60] In MIL08, the students voluntarily shared their avatar names, and some added a little background information. In MIL09, I decided to make reflection about the avatar mandatory, partly to stress its importance, partly to collect data.

Figure 5.19. The UMCS setting before we changed it.

Both in the COMBLE case, and in this MIL09 cycle, we decided to change the setting radically as to better reflect our pedagogical understanding and the anticipated activities. Figure 5.20. next page shows the auditorium as it looked when Mew and I started the MIL09 course.

Figure 5.20. MIL09 general "classroom" setting.

For some of the didactic discussions, I set up a mobile classroom in the air to highlight the NpIRL potential, but also to train the students' avatar movements.

Figure 5.21. MIL09 discussion in the mobile "classroom" up in the air.

The availability of space and prims (building blocks), enabled us to set up all sorts of relevant objects related to the progression and topics in the course, as exemplified in figure 5.22. next page showing posters with newbie tips. Furthermore, the space allowed me to design for the Christmas season and create a cosy ambiance as of December 1st.

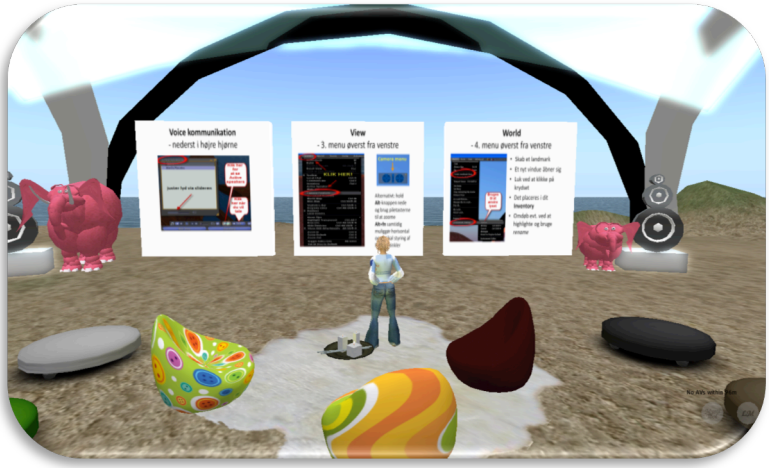

Figure 5.22. Posters with newbie tips in the MIL09 setting.

Based on the positive experience from the MIL08 cycle, I organized the students as one big group, however, in relation to their inworld presentations the students were free to split up in minor groups. Again, my role and that of Mew, was to facilitate and moderate discussions in FC, but we also let the students know that we expected the

majority of activities to happen in SL. Further, both Mew and I assumed the roles of technology stewards.

5.4.6. MIL09 LEARNING ACTIVITIES

As in MIL08, the activities were designed to support the students' mastery of the medium and the subject matter, and to facilitate cultivation of the community. The total number of activities was reduced to 20 and there were qualitative changes. Building Class and Friday Bar were not implemented again. Elements from the building classes, such as learning how to manipulate and design inworld objects were instead integrated in other sessions.

Figure 5.23. MIL09 students "writing" MIL on the ground.

Get-off-to-a-good-start sessions were now called *Newbie Nights*. At the f2f-workshop my co-facilitator, Mew and I stressed the importance of learning the basic skills, and as previously mentioned the students were now required to participate in minimum one of these sessions. In one of the Newbie Nights, Mew, planned a session, where the students had to "write" the programme's abbreviation, MIL, on the ground with their avatar bodies, as depicted in figure 5.23. and the purpose of this session was to train avatar navigation and camera control in a fun and informal manner.

Tours were now mostly included in Newbie Nights. *Christmas Celebration* was maintained and used to evaluate the course. The *Didactic Design Discussions* were maintained as well to facilitate discussions of subject matter related topics. One of the Didactic Design Discussions was facilitated by Mew, where he chose to focus on communities of practice's possibilities for design in virtual learning environments and on different degrees of immersion.

Another of these discussions featured two Canadian researchers, Terguy Tairov and Zak Zephaniah[61], with whom I have been collaborating in a small research project regarding the Community of Inquiry (COI) model (cf. chapter two). The purpose of inviting Terguy and Zak was twofold, partly to discuss the model in relation to education in virtual worlds, partly to show the international potential to the students.

Figure 5.24. MIL09 attending Mew's class.

In the MIL09 case, there were only two *Visits* that included meeting:

- Haunil Stine – Danish educator and former MIL student involved in an inworld project called CaseConnexion aimed at educating nurses
- Esme Qunhua – American technology training consultant, college instructor, doctoral student, and ISTE[62] inworld tour guide

Once again, the purpose of the visits was to show the students other professional uses of SL, and to discuss cross-cultural and international differences in education thus contributing to the sense of the global community situated in SL.

The MIL08 activity *Your Tour* had been very well received both by those presenting and by the students participating. This kind of more direct student influence inspired me to design a new activity called Your Presentation. Instead of doing their discussions and reflections, about SL as teaching and learning environment as part of their didactic

[61] Terguy Tairov and Zak Zephaniah are Terry Anderson and Ross McKerlich RL.

[62] ISTE is the The International Society for Technology in Education. The organization represents more than 100,000 educators and leaders throughout the RL world, and ISTE has been very active in SL for years.

analyses in the FC-environment, I wanted to give the students the opportunity to do this inworld. In other words, *Your Presentation* was the dissemination possibility b. Students who chose this option were still asked to reflect on the mandatory sub-topics in relation to a self-chosen target group, but they were also encouraged to include tours and use inworld objects as part of their presentations. An overview of the activities in MIL09 is summarized in table 5.7. below.

MIL09 – Overview of inworld activities		
Activity	**Description**	**Main objective**
Newbie Night (n=7)	Sessions focused on learning basic SL skills such as movement, communication, orientation, camera control, change of appearance, and the use of objects.	Mastery of the medium Facilitate development of inworld identity and community Support inworld practice and negotiation of meaning
Didactic Design Discussion (n=4)	Sessions focused on discussion of subject-matter topics based on course literature, experience from the two previous research cycles, and topics emerged inworld	Mastery of the subject-matter Facilitate development of professional identity and community Support inworld practice and negotiation of meaning
Tour (n=7, 5 included in Newbie Nights)	Sessions focused on exploring SL, discovering places and potentials relevant to the subject matter and the students' work-related interests.	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Visit (n=2)	Sessions focused on meeting experienced SL users; show & tell, discussing their particular SL practices related to the subject matter.	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Your Presentation (n=4)	Sessions facilitated by the students: Didactic Analyses focused on their particular, work-related interests	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Christmas Celebration (n=1)	Session focused on socializing and evaluation of the course	Celebrate our joint enterprise and evaluate the course

Table 5.7. Overview of SL activities implemented and studied in the MIL09 cycle.

The students were told that they could use either one of the sandboxes (building areas) on the UMCS Island, or a sandbox we borrowed from Doctor Asp, or they could choose a completely different location. Further, the students could choose to do their presentations individually or collaboratively.

All 20 activities, but two, were optional, and again, to allow for flexibility most activities were repeated several times, placed on different weekdays, and announced in the beginning of the course. Once again, an inworld MIL group was created, and the students were asked to join it. The students were given 500 Linden Dollars each. However, seven out of eight students choose to do Your Presentation and most of them needed more money to buy objects (e.g. special clothes or tools), and to upload their slides.

5.4.7. MIL09 LEARNING EXPERIENCES

In MIL09, there were 20 scheduled activities, and with 113 attendees out of 160 possible, the overall attendance was 70%. Detailed student attendance in the scheduled MIL09 inworld activities is shown in table 5.8. below.

MIL09 – Student (n=8) attendance in inworld activities		
Activity	**Number of students (total)**	**Attendance**
Newbie Night, incl. 5 tours (n=7)	28	50%
Didactic Design Discussion (n=4)	25	78%
Tour (n=2 because 5 were incl. in Newbie Nights)	12	75%
Visit (n=2)	12	75%
Your Presentation (n=4)	29	90%
Christmas celebration (n=1)	7	88%

Table 5.8. MIL09 – Student attendance in inworld activities.

As expected in this cycle, the students' inworld activity increased, while their activity in FC decreased. Attendance in *Newbie Nights* increased with 33% compared to MIL08, indicating that the students took notice of our recommendations of seeking help inworld. Once again, the *Didactic Design Discussions* were highly popular. The students were not required to participate in the presentations made by their fellow students, but as the numbers points out, the attendance in these sessions was nonetheless very high. When asked about their attendance, the students explained that skipping a session left

them with a feeling of missing important learning, and in relation to their fellow students' presentations, they clearly felt obligated to participate, partly to show their support, partly because these sessions were considered of educational value (MIL09-Obs-16/12-2009-Book3).

Figure 5.25. MIL09 Group 1 presenting inworld.

Because the students now had the possibility of presenting their analyses inworld, Mew and I were more focused on teaching the students specific inworld skills (e.g. buying and opening objects, using the camera, creating a note card, using a presentation screen). Partly because of this focus, and partly because the class was limited in size, both Mew and I noticed some distinct differences among the students in terms of how quickly they learned to master SL. Especially two students clearly struggled with SL, and this literally became very visible in this kind of environment. After his first session, where the students had to "write" MIL on the ground with their avatar bodies, Mew reflected on his experience:

> I'd completely forgotten, and it was somewhat a surprise, how students who enter SL as newbies are in need of massive support to learn the, to me, basic functions. (…) I hadn't really anticipated that the first workshop, where we were supposed to collaborate on writing MIL, could be frustrating to anybody. I was prepared that it would demand a slow progression with thorough instructions, but I wasn't prepared for it [the frustration] to block the process completely. This of course also has to do with the speed by which each student acquires skills, understanding, and appreciation of SL. (MIL09-FC-Meta-reflection-November)

One of the students in question also reflected on her experience explaining how oral instruction combined with the complexity of SL was difficult for her:

> The teaching process is conducted via oral instruction, and of course there has to be some kind of progression based on the average student. But when I have basic problems that are difficult for the instructors to understand and remedy because of the distributed synchronous activity and SL's complex functionality, it takes a long time before my problems are solved. Meanwhile, there have been oral instructions about something new, which I don't remember, because I was busy solving another problem. This is necessary to ensure progression, but it also means that I become passive. I don't acquire the basic skills (…). I haven't been part of the joint experience, which was supposed to promote our community, and my identity becomes "**The Outsider**". Evidently, this is the opposite of what was intended. However, I have learned something else. I need to learn the way my experience tells me is the most appropriate. I will try to explore SL with the help of a written manual, so that I can lean in my own pace. (MIL09-FC-discussions-November – original emphasis)

It should be noted that frustrations among students are quite common in the newbie phase and one of the major challenges of learning how to learn (and how to teach) through SL, is to learn to accept frustration, uncertainty, and "unconcealed failing". Based on my experience from the previous cycles, and the fact that SL was not a learning object per se, these were my main arguments for not making inworld presentation of the students' didactic analyses mandatory. In line with this, I did not ask the students to choose dissemination format until they had gained some experience with SL (by the end of November). In the end, seven of the eight students chose to do their presentations in SL, four of them in pairs, three individually. Unfortunately, one of the students had to cancel her inworld presentation, in the last minute, due to technical problems. The student presentations were set to last for approx. two hours, and the presenting students were in charge of all activities. As seen in table 5.9. below the presentations varied greatly in terms of target groups and focus.

MIL09 group 1 inworld presentation: Teacher education - focusing on religion as subject matter (Riis, 2009, December 26th)		
Keywords	Potentials/added value	Challenges
Used free teacher training place at EduIsland 4 Recorded video presentation – avatars to handle on-going dialogue Two field trips – explore and discuss religious places Change of clothes, animate avatars e.g. to pray	NpIRL Reflection Change of POV via camera and the avatar Field studies Observation vs. participation Identity, religious culture Freebie culture	Technology Learning curve Avatar phenomenon Teacher preparation

Continues next page ..

MIL09 group 2 inworld presentation: Dental education - focusing on communities of practice (Riis, 2009, December 27th)		
Keywords	Potentials/added value	Challenges
Used presentation space at Media Learning Island One field trip – explore and discuss theoretical remediations Theoretical models Community of Practice framework application	NpIRL 3D reification of theoretical models Real-time mediated communication Community building	Technology Learning curve Time to build inworld Teacher preparation
MIL09 group 3 inworld presentation: Vocational training - focusing on building and simulation (Riis, 2009, December 27th)		
Keywords	Potentials/added value	Challenges
Used own inworld home at Innovative Learning Island Two presentation screens Presentation via Alt, incl. video clips One field trip – explore and discuss a construction site Wear professional uniforms	NpIRL 3D reification of RL buildings Vocational training Flexibility (time/space) Role-play Professional identity development	Technology – also in terms of proprietary inworld building tools Learning curve Avatar phenomenon Teacher preparation
MIL09 group 4 inworld presentation: Speech Therapy - focusing on experiences for ALS patients (Riis, 2009, December 29th)		
Keywords	Potentials/added value	Challenges
Used sandbox at UMCS Island Two presentation screens Two field trips – explore avatar-mediated activity and beautiful places Change of clothes, animate avatars to ice-skate	NpIRL Transformation/learning through experience Immersive environment Visual communication Community building Social inclusion	Technology – also in terms of users with disabilities Learning curve English default language (of GUI and world in general)

Table 5.9. MIL09 inworld student presentations.

Even though the MIL09 students in their presentations worked with different target groups, had different aims, and based their reflections on different theoretical ideas, it is interesting to observe the similarities in terms of identified potentials and challenges of SL as an educational MUVE. In all presentations the ability to do things Not-possible-In-Real-life (NpIRL) was highlighted as one of the most exciting features of SL. For example, the students in group 1 explained how it would be impossible for non-Muslims to visit the "Black Stone" in real life, whereas at the Islam Online island, it

would be possible and could enable meeting and engaging with Muslims, making this island interesting for field studies. In group 3, the student showed us a construction site build to illustrate the dangers of non-compliance with health and safety workplace legislation, which could be used to role-play in vocational training. The students also emphasized the synchronous communication possibilities and their importance in terms of community building. All groups were ambivalent in relation to the avatar phenomenon, on one hand it made role-play possible, but on the other hand it also challenged the user on a more fundamental ontological level, raising difficult questions which could detract from learning processes and goals. Even so, all students agreed that the avatar was essential in terms of sensing presence of self and others.

Technological problems and the steep learning curve were considered the most problematic issues when using SL as an educational MUVE. According to the students, the time needed to overcome such challenges posed a serious constraint in terms of whether the students envisioned using SL in their current practice or not. While all the students were positive towards using SL, they foresaw difficulties in convincing colleagues and leaders on this account.

Figure 5.26. MIL09 Group 2 presenting inworld.

5.4.8. MIL09 LEARNING OUTCOME

All eight students passed the course and met the qualitative demands without remarks. The number of postings in the FC-environment decreased to 175 with 116 postings directly related to the subject matter. The most remarkable decrease was in the main conference, where, in comparison to the MIL07 and MIL08 cycles, there were fewer organizational postings indicating that such questions had either decreased or were

dealt with inworld. Once again, the main objective of the course was for the students to learn how to conduct a Didactic Analysis, and again the students managed to learn this. Moreover, the students learned not only about SL, but also how to use SL, and their analyses reflected the changes in the course design insofar as their approach to SL indicated knowledge much better grounded in inworld practice compared to the two previous courses - even for the two students who did not present inworld.

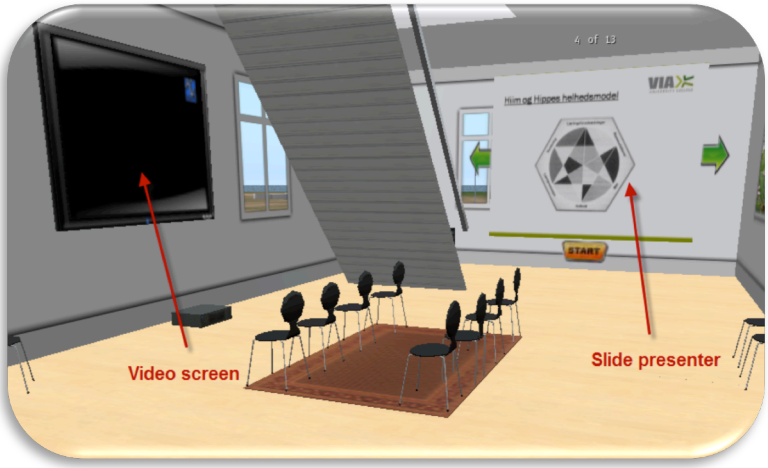

Figure 5.27. MIL09 Group 3 inworld presentation area.

Reflection about the course and what the students felt they had learned became mandatory in the MIL09 cycle. Once again, I asked the students to base their judgement on the learning goals from the curriculum, and I asked them how they felt about spending so much of their study time in a synchronous environment. The two students, who followed a full-time study programme, had been working closely together throughout the course, and they chose to do their final reflection collaboratively as well, whereas the remaining six students reflected individually. Again, all students felt that they had achieved the curricular goals. Three of the students highlighted how, learning in SL had helped them understand theoretical concepts in a unique way:

> The learning that happens in SL through experience is not something you can learn through reading. When we visited "**ORGANICA**Happy Clam Island" that experience gave me a completely different understanding of what a virtual world is because the sensory stimulation was so strong that it really felt like being in another world. Because of this, I now understand theoretical concepts such as immersion and agency much better. The experience resulted in an understanding that I couldn't have achieved any other way. (MIL09-FC-Meta-reflections-December)

> The SL course has been quite time consuming, as it was mentioned when we started, but the time has been very well spent. It has been a very welcome break in our study to participate in a more synchronous course, and thus have more contact with both teachers and fellow students, and to be able to collaborate by other means than the usual FC, Skype, Connect, Google Docs etc. (…) The "hands-on" part has been fantastic in terms of shedding light on concepts such as immersion, augmentation, remediation, emergence, and agency, and this has contributed radically to our ideas of what a VLE has to offer. (…) In our experience, immersion facilitates engagement, but doesn't promote the same systematic and deep theoretical reflection as writing, so a combination of SL and FC is good. (MIL09-FC-Meta-reflections-December)

For these MIL09 students, learning via SL also meant connecting to their peers and the teachers in a different way:

> I agree that these online evenings in SL have been a welcomed break, and in many ways just as qualified as written posts. It has been a completely different and exciting way to participate in online education, and I think it has been doable within this limited time frame. However, I couldn't imagine two years like this (nor could my family!). I think you connect with the teachers and fellow students in a closer way, i.e. the way we communicate is less formal and more everyday-like. Something, which can be difficult to achieve at the f2f-seminars, and something that is impossible in the asynchronous discussions. (MIL09-FC-Meta-reflections-December)

> It's surprising how "personifying" SL is when you get to know it. The way you unconsciously ignore that your avatar merely is "bits and bytes", and how you start to act and position yourself as when you're in Real World (RL) is overwhelming and thought provoking. (…) Despite (or perhaps because) we've spent a lot of time in SL, I think that we have met the intellectual, the subject matter related, and especially the practical goals for the module because of the didactic design. All of this naturally depends on whether the t echnology works, or not!! The technical problems we've encountered are after all part of reality when you work with IT. (MIL09-FC-Meta-reflections-December)

> My learning process wouldn't have been possible without support from Mariis, Mew, and the rest of you. I've been allowed to fail, stand on the chair, burst into a lecture and sit between two chairs - even with a parrot on my shoulder. I've been the one in need of special Ed with the teacher, and I've felt like a complete failure because I couldn't do what the rest of you were able to. I can use all of these experiences in my daily work. (…) I've participated in a community of practice with all that it entails; knowledge has been reified and used. In the group, we have shared knowledge on a very high theoretical level,

> and tacit knowledge has become shared knowledge. (MIL09-FC-Meta-reflections-December)

The time necessary to get a sense of mastery was mentioned by all the students and gave rise to interesting reflections:

> Because of my prerequisites in relation to this medium, I've been forced to spend quite a lot of time on practicing, and I've spent more than 100 hours inworld in SL. The many joint activities have been very time consuming. (…) On the other hand, there is no doubt that the joint activities have contributed to our recognition of this medium's potentials. (…) It has been remarkable to experience how much energy there has been put into this experiment both from the teachers and us. Our use of communication technology has been challenged, and perhaps our identities as well? (MIL09-FC-discussions-December)

> you can walk around and go to places with other people from the entire world, and because you're able to use body language in the synchronous discussions. (…) But there have also been difficulties. It's been difficult to spend so many evenings between 20-22 on the meetings in SL, and even though it wasn't mandatory to participate it quickly became evident how much you missed when you weren't there! It made it difficult to find the time to read the literature. And the technical problems with lacking or poor sound made it difficult to get a flow in the sessions. I still think it would be a pity to move the processes back into FC, because when you come from a vibrant 3D world with colours and music, going back into boring FC is an anti-climax! (MIL09-FC-Meta-reflections-December)

The MIL09 students' evaluations of what they had learned and how they perceived SL as a learning environment were consistent with Mew's and my impressions. Again, valuable lessons were learned, but as we shall see, I was becoming increasingly frustrated with the huge amount of time the students, a potential co-facilitator, and I needed to spend to make ends meet.

Figure 5.28. MIL09 Group 4 presenting inworld.

5.4.9. MIL09 REFLECTIONS AND DESIGN CONSEQUENCES

The research interest in the MIL09 cycle was to continue the study of SL as VLE, refine specific activities, and implement a new assessment method. The overall design strategy was more radical than in the previous cycles because of the changed optional assessment method. The design was guided by 11 principles in total, and two new principles concerned promotion of inworld reification and newbie support through inworld technological stewarding. To support both principles, a co-facilitator, Mew joined and managed some of the sessions inworld. In general, the results were very positive insofar as the students reported of (and expressed through their didactic analyses) a deeper understanding of and more meaningful experience with SL. As anticipated, the level of activity in FC decreased, whereas the activity level inworld increased.

MIL09 students' responses in relation to rhythms (togetherness and separation)

In this MIL09 cycle, the students, Mew, and I succeeded in establishing an inworld rhythm with plenty of indications of sustained mutual engagement. However, contrary to the MIL08 cycle most communal activities took place inworld, and not in FC. Interestingly, the "community time" seemed to decrease inworld, and instead the MIL09 students spent more time on their own or in their groups preparing for the presentations. While there was a problem with lack of separation in the previous cycle, in this MIL09 cycle, the students did seem to have more individual time, but rather than spending this time reading the assigned literature, it was spent on learning how to master the medium given that this was a necessity for the presentations.

MIL09 students' responses in relation to interaction (participation and reification)

In many ways the principle of promoting inworld reification and the new assessment method were successful insofar as they helped establishing a necessary alignment between the two polarities. Inworld participation became meaningful and influenced the students shared repertoire. Contrary to previous cycles, the MIL09 students acquired a specific professional vocabulary connected to inworld design/building, and thus contributed to their shared repertoire in a different way than through actions. As we saw above, some of the students also noted that their practices inworld expanded their understanding of theoretical concepts such as immersion, embodiment, and remediation.

MIL09 students' responses in relation to identities (individuals and groups)

Again, the students continuously addressed the avatar phenomenon, and as we saw above, the avatar also played an important part in the student presentations. In this MIL09 cycle, it was mandatory for the students to participate in at least one "Newbie Night", and in my log I noticed that many of the questions in these sessions concerned the avatar - especially its appearance (MIL09-Obs-03/11-2009-Book3; MIL09-Obs-05/11-2009-Book3; MIL09-Obs-10/11-2009-Book3 and MIL09-Obs-17/11-2009-Book3).

In the MIL09 cycle, the inworld assessment method provided new opportunities for the students to collaborate. For those working in groups the joint enterprise clearly affected their learning process and outcome in a positive manner, and it also gave them a safe space to negotiate and experiment with their identities as avatars and as professionals. For those working alone, Mew and I tried to create that space.

Again, in the MIL09 cycle, the three polarities highlighted the importance of informed design. Summing up, the findings from the MIL09 cycle revealed that design of an assessment method better aligned with the learning environment and the object of study (analysis) was a success in term of promoting more meaningful learning experiences overall. The collaboration with my co-facilitator, Mew, also proved successful, not only in term of sharing the responsibility for helping the students, but also in term of discussing our observations and reflections, notably in regard to the pedagogical design.

Despite this being the most successful research cycle, I did express some concerns on my blog after the course was completed. In a post, where I tried to summarize my findings based on all three research cycles, I wrote:

> Looking back all three courses have been successful in the sense that the students undoubtedly have learned a lot, but there is an unsolved discrepancy between the huge amount of time both the students and I have been spending and the flexibility that is needed in an educational setting like this. MIL students are used to a workload of 15-20 hrs. pr. week, but in general they control and manage this time on their own, and this changes noticeably when you choose to remediate the majority of the activities into a complex, synchronous medium like SL. And so I'm wondering; is it worth it? Does it make sense to use SL given these particular circumstances (4 effective weeks, a curriculum other than the medium itself, full time employed students and recurring technical challenges)? I honestly can't say for the time being. (Riis, 2010, January 3rd)

Even though I had reduced the number of activities, the amount of time we all spent inworld was still problematic. For the students it meant that they struggled with finding necessary time to study the literature, and while I, as their teacher, did not detect any theoretical shortcomings in their analyses, it clearly stressed the students and decreased the overall flexibility. Further, I was concerned because the students spent much time on learning something, which was not a direct curricular goal. Yes, preparing for their analyses inworld helped the students understand some concepts in a different, one could say more grounded and embodied way, but was it justifiable if this happened at the expense of other learning goals?

In the MIL09 cycle, besides reducing the number of inworld activities, I was fortunate to be accompanied by a co-facilitator, but even so I still ended up spending way too much time inworld preparing for sessions or helping the students. The amount of time I spent on the course was in no way aligned with the amount of time allocated to this type of MIL course. Furthermore, in terms of sustainability and transferability, I also doubted that any of my colleagues would want to spend this amount of time. For me it was doable, only because I was a PhD-student with fewer time restraints than other colleagues.

Nonetheless, at this point in time, the MIL programme was revising the curriculum, and I knew that this revision would allow me to better align the domain (incl. the learning goals) with the actual practice in SL in future iterations. Based on the experiences form the MIL09 cycle, I decided to focus on how to transform the overall practice of the course from being an asynchronous course to a synchronous. The new assessment method had proved valuable in this regard, and I therefore wanted to continue studying this as well.

5.5. THE MIL10 CYCLE

In this section, I present the actions taken in the fourth and final research cycle, where the research interest was to study SL as VLE, the impact of activities, a revised assessment method, and a transformation of the overall practice through better alignment between the domain and the practice. The latter was enabled by a curriculum change. In many regards the design of this research cycle resembled that of the MIL09 cycle, which had been quite successful apart from the amount of time the students and I had spent. Therefore in this final description of the research cycles, I have chosen to elaborate mainly on the design elements that changed compared to the MIL09 cycle and by giving the students' reflections stronger voice.

5.5.1. MIL10 RESEARCH INTEREST AND DESIGN STRATEGY

The fourth research cycle was conducted in the winter 2010/2011, and the research interest in the MIL10 cycle was to further study SL as VLE, different activities, and the synchronous assessment method. Furthermore, I decided to change the overall communication mode from asynchronous to synchronous by making SL a learning objective in itself. Thus, compared to the previous cycles, the MIL10 design strategy was the most radical. Based on the experience from the MIL09 cycle and the fact that the curriculum had changed, a specific problem solving interest (PSI) was identified as summarised in table 5.10.

Research cycle	**Research interest (RI)**	**Problem solving interest (PSI)**
MIL10	Further study SL as VLE, the impact of specific activities, a revised assessment method, and an enhanced domain-practice relation and a transformation of the overall practice in the MIL community.	PSI3: How can design of the MIL course focused on enhancing the domain-practice relation solve the general problems of transformation of practice in SL?

Table 5.10. MIL10 Research interest and problem solving interest.

An overview of the elements in the MIL10 community is presented in figure 5.29., and again the model will serve as guideline for the following description and reflection.

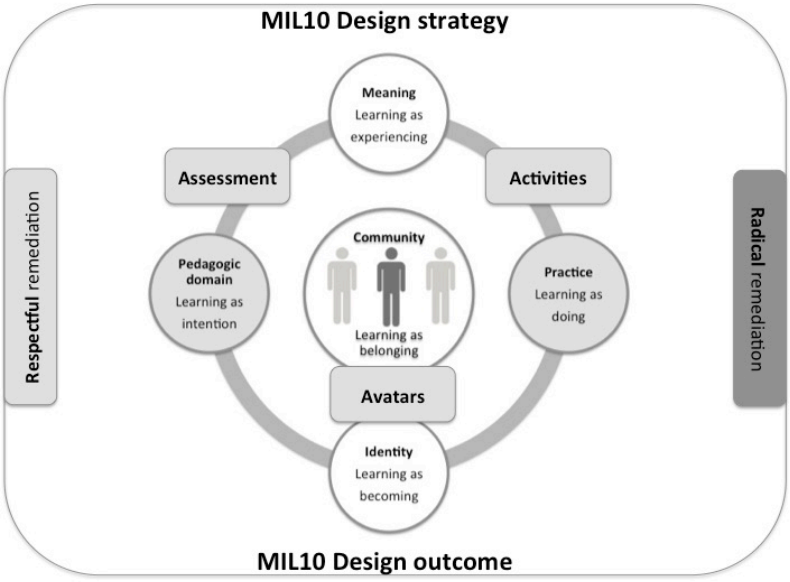

Figure 5.29. The MIL10 cycle.

In the MIL10 cycle, I chose to apply all of the previously developed design principles with only minor changes. I did, however, also develop a new 12th principle:

12. **Promote domain-practice alignment**

It should be noted that there are certain similarities between the fifth principle, which focuses on value, and the new principle. Nonetheless, whereas the fifth principle deals with alignment between subject matter and the medium/the virtual learning environment and its technical features, the new principle was more general and included all design elements, not only inworld activities.

5.5.2. MIL10 PEDAGOGICAL DOMAIN

As previously mentioned in chapter four, the MIL programme implemented a new curriculum in September 2010, which included the so-called optional modules. In the fall 2010, the students were able to choose between four of these modules each providing "a particular perspective on ICT and learning" (MIL studieordning, 2010, p. 14 – my translation), and the course on SL, now entitled "SL and Dialogic Didactic Design" was one of these. The curricular change meant that I could design the module in such a way that SL became a learning objective in itself, making it legit for the students to spend time on SL without the worries previously expressed.

The curricular change also meant, that the content was no longer restricted by the five mandatory sub-topics that had provided the frame for both the literature, discussions, and analyses in the three previous courses in this study. Instead some of the texts in the print compendium were replaced with literature relevant to teaching and learning in 3D virtual worlds.

5.5.3. MIL10 TIME AND SPACE

The change also resulted in a longer time frame, so that the module ran for eight weeks from December 5th 2010 through January 25th 2011, incl. Christmas holidays. The changes also meant that the face-to-face seminar took place already on October 30th 2010. Furthermore, the amount of ECTS-credits increased from four to five resulting in an expected student workload of 137, 5 hours.

Once again the study activities were situated in three different locations; at the seminar, at the participants' workplaces, and in the participants' private settings, and again scheduled activities inworld took place between 8-10 PM, except for Fridays and Sundays between 3-5 PM.

5.5.4. MIL10 PARTICIPANTS

Twelve students signed up for the module, however, one student fell ill and only participated in the face-to-face workshop and is therefore not included in the data. The curricular change influenced the profile of the students as well. Ten students were working as teachers within different areas of the educational sector, one student worked with educational publications. Contrary to the previous three courses, the MIL10 students were a mix of first and second year students, meaning I could not expect they would have the same theoretical background knowledge. Further, for one student this was her first module at MIL. All but one participant were considered to match the profile of being relatively tech-confident in terms of general ICT, and while the majority still did not have any experience virtual worlds/games, two participants were familiar with SL before the course, and one these was very experienced.

5.5.5. MIL10 VIRTUAL LEARNING ENVIRONMENT

Again, the virtual learning environment in the course was a combination of FC and SL, and the number and purpose of forums in FC were similar to the MIL09 case, as seen in figure 5.30 (next page).

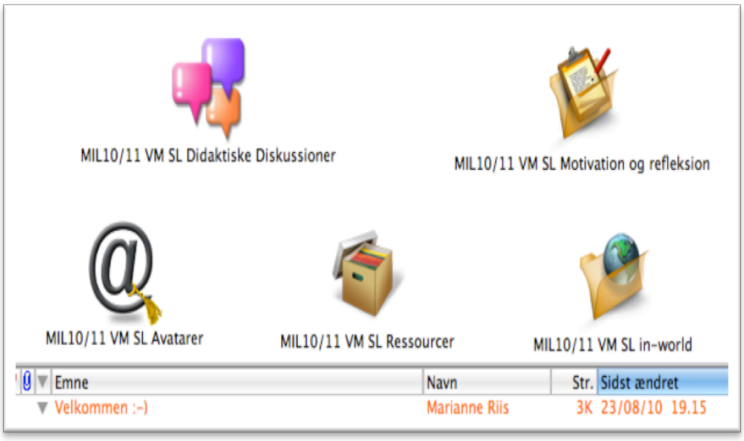

Figure 5.30. FC in the MIL10 cycle.

In FC the module activities were situated in the forums:

- MIL10/11 VM SL Didaktiske Diskussioner - conference for voluntary discussions
- MIL10/11 VM SL Motivation og refleksion – conference for the students' motivation for joining the course and for their final reflections
- MIL10/11 VM SL Avatarer – conference for presenting participants' avatars
- MIL10/11 VM SL Ressourcer – folder containing information and literature
- MIL10/11 VM SL in-world – conference containing information on in-world activities
- Main conference (below the bar) – for general communication between the teacher and the students

In the MIL10 case, we were back to using the holodeck, but I had also managed to borrow two additional sandboxes from inworld colleagues for our activities. Teacher led activities took their point of departure in either the holodeck or in the main WD sandbox (that looked like a green lawn). For most part of the MIL10 course, the WD sandbox was kept empty due to prim restrictions, meaning that we only rezzed objects, when we needed them. This procedure ensured that the students always had a place where they could go and practice the use of objects. On the other hand, this also meant that the sandbox was empty most of the time.

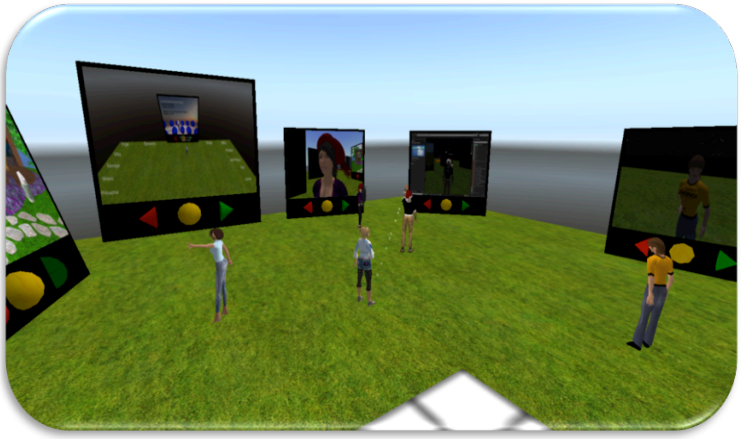

Figure 5.31. MIL10 students learning to use presentation screens in the WD sandbox.

5.5.6. MIL10 LEARNING ACTIVITIES

Once more, the activities were designed to support the students' mastery of the medium and the subject matter, and to facilitate creation of the community. An overview of the activities in MIL10 is shown in table 5.11.

MIL10 – Overview of inworld activities		
Activity	**Description**	**Main objective**
Newbie Night (n=4)	Sessions focused on learning basic SL skills; movement, communication, orientation, camera control, change of appearance, and use of objects	Mastery of the medium Facilitate development of inworld identity and community Support inworld practice and negotiation of meaning
Didactic Design Discussion (n=4)	Sessions focused on discussion of subject-matter topics; based on course literature	Mastery of the subject-matter Facilitate development of professional identity and community Support inworld practice and negotiation of meaning

Continues next page ...

Tour (n=8, included in Newbie Nights or Didactic Design Discussions)	Sessions focused on exploring SL; discovering places and potentials	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Visit (n=1)	Session focused on meeting experienced SL users; show & tell, discussing their particular SL practices related to the subject-matter	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Presentation Exercise (n=1)	Session focused on practicing presentation skills and manipulating in-world objects	Mastery of the medium Support inworld practice and negotiation of meaning
Your Presentation (n=4)	Sessions initiated and facilitated by the students; Didactic Analyses focused on their particular, work-related interests	Combined mastery of medium and subject-matter Support development of identity, community, inworld practice, and negotiation of meaning
Course Celebration (n=1)	Session focused on socializing and evaluation of the course	Celebrate our joint enterprise and evaluate the course

Table 5.11. Overview of SL activities implemented and studied in the MIL10 case.

The total number of activities was further reduced to 15, and again there were qualitative changes. *Newbie Nights*, incl. *Tours* and the *Didactic Design Discussions* were maintained. One Didactic Design Discussion featured British researcher, Gann McGann[63], who had focused on presence and identity formation in SL in his 2010 PhD dissertation. In the MIL10, case there was only one planned Visit to meet Inga Miles[64], a MIL alumni and participant in the MIL07 course. Inga works as an e-learning consultant at the University of Southern Denmark and was involved in a EU funded research project on education in virtual worlds[65].

[63] Gann McGann is Mark Childs RL.

[64] Inga Miles is Inger-Marie Falgren Christensen in RL.

[65] The project is called AVATAR, **A**dded **V**alue of te**A**ching in a vir**T**u**A**l world.

Figure 5.32. MIL01 visiting Inga Miles to learn about the AVATAR-project.

Your Presentation, which was developed in the MIL09 cycle had proven very successful and was maintained. However, contrary to MIL09, the student presentation became mandatory. In MIL09 I had identified a need for the students to practice using inworld tools and objects, and so in order for them to feel more confident in terms of their presentations, I developed the *Presentation Exercise*. Given that the course in MIL10 passed Christmas, the name of the celebration was simply changed.

I asked the students to participate in minimum one activity to ensure that they experienced the sense of "being together". Based on the experience from the previous research cycles, all sessions were set for a two hour duration to allow for plenty time to start with audio and other technical rehearsals. Once again, an inworld MIL group was created, and the students were asked to join it. Instead of giving the students more that the usual 500 Linden Dollars, I decided to focus on taking them to places where they could shop free, and the students were asked to try to stay within budget.

5.5.7. MIL10 LEARNING EXPERIENCES

In MIL10, there were 15 scheduled activities, and with 124 attendees out of 165 possible, the overall attendance was 75%., which was a slight increase compared to the MIL09 cycle. Detailed student attendance[66] in the scheduled MIL10 inworld activities is shown in table 5.12. next page.

[66] Again, sessions in SL ran for two hours, but not all students attended from the beginning and/or throughout the sessions. Numbers are based on attendees in the first half hour, and should be regarded as an estimate.

MIL10 – Student (n=11) attendance in inworld activities		
Activity	Number of students (total)	Attendance
Newbie Night, incl. 3 tours (n=4)	23	52%
Didactic Design Discussion, incl. 4 tours (n=4)	37	84%
Visit (n=1)	8	72%
Presentation Exercise (n=1)	9	81%
Your Presentation (n=4)	38	86%
Course celebration (n=1)	9	81%

Table 5.12. MIL10 – Student attendance in in-world activities.

As in the previous cycle, the MIL10 students' activity inworld increased, and the FC environment was mostly used as a repository. Again, the most popular sessions were the Didactic Design Discussions and the students' own presentations. The new activity, the Presentation Exercise also turned out to be quite popular.

Figure 5.33. MIL10 Group "Three Crowns" presenting inworld.

In this cycle, I asked the students to reflect on the different types of activities and their learning outcome. Below are some of their reflections on the Didactic Design Discussions:

> In my point of view, it was a good structure because the didactic design dialogs were based on a combination of presentations, discussions, and visits to relevant locations. The external presentation by Mark Childs and the visit to AVATAR were also very exiting. I was particularly inspired by Childs because I'm very preoccupied with the avatar concept as well. (MIL10-FC-reflections-January)

> This was where my process really took off, because now there was a goal and somebody to discuss your experiences with. (MIL10-FC-reflections-January)

> I experienced the transition to a more theoretical and learning focused approach as good and meaningful, and I see the importance of spending time on practical exercises so that technical challenges don't spoil the motivation or overshadow the subject matter. (MIL10-FC-reflections-January)

As seen in table 5.13 below, in terms of student presentations, the focus, target groups, and the ways they were executed varied a lot, as they did in MIL09.

MIL10 group "Three Crowns" inworld presentation: Secondary school - focusing on cooperative learning (Riis, 2011, January 14th)		
Keywords	Potentials/added value	Challenges
Used sandbox at Innovative Learning Island Cooperative Learning Two field trips – explore and discuss experiences and collaboration Animate avatars to dance	NpIRL Cooperation in real-time Experiences and simulations Student engagement	Technology Learning curve Lack of f2f cues SL restricted to users +16 English default language
MIL10 group "milis" inworld presentation: Science eduation - focusing on various types of remediation (Riis, 2011, January 20th)		
Keywords	Potentials/added value	Challenges
Used sandboxes and various locations on Danish Visions Island Remediation framework application Build classroom One field trip – explore, try and discuss 3D reification of scientific models	NpIRL Learning-by-doing Creativity and innovation 3D remediation Immersive environments Design for avatars	Technology Learning curve Student and teacher resistance Teacher preparation

Continues next page ...

MIL10 group "MIL Health" inworld presentation: Nurse education - focusing on simulations (Riis, 2011, January 24th)		
Keywords	Potentials/added value	Challenges
Used own sandbox at CaseConnexion Island Presentation screen Embodiment and presence Wear professional uniforms, use wheel-chairs One field trip - explore, observe, discuss simulations	NpIRL Role-play Simulation of clinical practice – "safely" Reflection via avatar Professional identity	Technology Learning curve Avatar phenomenon Fear of public failure Time spent on medium vs. subject matter Teacher preparation

MIL10 group "MILOVIOLA" inworld presentation: Primary school - focusing on ADHD pupils (Riis, 2011, February 1st)		
Keywords	Potentials/added value	Challenges
Used sandbox at Danish Visions Island Presentation screen Scaffolding Collaborative writing Three field trips – explore and discuss potentials Buy freebies	NpIRL 3D reification Fun, enjoyable learning Gamification Role-play Simulations Social and life skills Social inclusion Freebie culture	Technology Learning curve Open/public environments Information overload Gamification

Table 5.13. Overview of MIL10 presentations.

5.5.8. MIL10 LEARNING OUTCOME

All 11 students passed the course without any remarks. The number of postings in FC increased a bit compared to the MIL09 cycle, but there were three more students in the MIL10 cycle. Despite the fact that the MIL10 course on the whole was designed as a synchronous course, the students still needed a place where they could communicate asynchronously. There were a total of 286 postings, but only 54 were directly related to mandatory topics (motivation and reflection postings and presentations of their avatars), the rest were classified as either social or orientation (in many cases to communicate with their group members).

Figure 5.34. MIL10 Group "milis" presenting inworld.

For two students in this course, both the SL GUI and the avatar took away attention from the supposed learning process:

> I felt very ADHD-ish during the first Newbie Nights because I focused on a lot of things simultaneously, and I was too busy adjusting settings and preferences, to be able to pay attention to what was being said. I was actually very impressed by the incredible patience the teacher and my fellow students showed me. (MIL10-FC-reflections-February)

> Slowly, slowly you gained control over your movements and the different options in SL. I did experience some impatience because of the speed whereby both the rest of the group and I learned things. I experienced a greater well being when I learned to navigate better and got to know the environment. But ever so often I felt that navigation of my avatar took away some of the attention from the teaching. (MIL10-FC-reflections-January)

As in the previous research cycles, there were many technical challenges:

> Again, again, and again others and I experienced numerous crashes and network problems. Our place and the exercises in Newbie Nights were both exiting and were well executed at a high theoretical level – I personally learned a lot about communication and the use of tools. I think the learning curve is pretty steep. I think the sessions should be mandatory. (MIL10-FC-reflections-February)

Figure 5.35. MIL10 Group "MIL Health" presenting inworld.

However, in relation to mastery of the medium and technical challenges, the students found help inworld:

> My first experiences in SL were influenced by technical problems; frozen screen and often lack of sound, and sometimes "crash" of the pc. Luckily, it became better as I learned to handle the technical challenges, which enabled me to focus on my avatar and the virtual space. It has been an important lesson to learn just how much time and how much structure is necessary to become confident in using SL. The didactic design behind Newbie Nights, with different activities and practical assignments, has enabled me to gradually gain insight and competence to act in SL. In other words; good legitimate peripheral participation. (MIL10-FC-reflections-January)

> Great with Newbie Night for newbies like us. Second Life is difficult to master without help. It was fun to visits the different islands and to see how others use Second Life. I wish I'd had more time to explore … (MIL10-FC-reflections-January)

Fortunately, the students felt they had managed to learn the basics through these sessions:

> Impressive start, it is always interesting to start a new course with newbies in SL. Everybody learned the basics and there was sufficient time to answer the many questions. (MIL10-FC-reflections-January)

> Even though the period wasn't overwhelmingly technical, it was good to learn how to build, move, and manipulate different objects, and to use different

> kinds of boards. In this phase, it was interesting to learn about Marianne Riis' model about respectful and radical remediation, which could be used in relation to avatars and environments, and as we did in my group, in relation to activities. (MIL10-FC-reflections-January)

When reflecting on their own and fellow students' inworld presentations, the domain-practice relationship was highlighted on several occasions. Furthermore, the inworld presentations forced the students to reflect upon their roles as teachers vs. learners, and of the transition from being RL domain experts/old-timers to being newcomers in SL, as expressed by these students:

> When I had to be the actor in SL, I experienced an otherwise familiar role as teacher become relatively unknown again. Expert in RL, novice in SL. It was good that we were multiple teachers, because I didn't manage to keep track of things all the time. I felt that the preparation time for teaching in SL is bigger because upload of PowerPoints, preparation of the "classroom", and the didactic considerations take longer. Further, you can't expect to have all the time to teach, you have to include time for technical problems. My ability to stay focused was also challenged, because it takes time to get used to unusual distractions such as the chat and your own avatar appearance. (MIL10-FC-reflections-January)

> I've been forced to be the learner. I've tried to be newbie and not quite understand what was going on. Normally, when I teach ICT I consider myself a competent user, but here in SL I've tried to be in the opposite position. Even though it will not be SL that I have to teach, it has given me better insight into how students sometimes feel when they experience problems with ICT, and how perhaps it isn't always easy to ask for help and expose your shortcomings. (MIL10-FC-reflections-January)

> As an actor, it was very interesting to initiate an activity and the take a break while the "students" went out in the world to solve the tasks. This was something that I recognize from teaching. It may seem trivial, but on the other hand, it shows how the learning environment in SL enables very respectful remediations. As an observer, it was very interesting to see how different the presentations turned out to be. It was interesting that we as relatively untrained avatars were able to design learning processes that varied a lot. (MIL10-FC-reflections-January)

Other students pointed to the participation-reification duality and found an advantage in being able to read theory and then convert it into some form of practice:

Definitely the best period for me. It was very rewarding to participate in fellow students' presentations and learn about other contexts that your own. There's much to be learned from reflection over other people's considerations. There goes a lot of work into doing this in a written format, but in this module the synchronous response has been manageable – meta reflection, participation, reification … Super :-) To plan and perform the presentation has probably been the most rewarding. To read the theory, convert it to action, present, and finally explain your considerations. (MIL10-FC-reflections-January)

I really felt that SL has offered a lot of exiting possibilities in terms of teaching – something that the participants marvellously exemplified in their presentations and by including the theory. My experience was that it wasn't until the planning that I became aware of the relevance of the possibilities in SL in relation to didactic design, and I wasn't able to reflect about my own learning as a teacher inworld until after the presentation. (MIL10-FC-reflections-February)

It has been quite rewarding to plan and execute our own presentation, but it has been just as rewarding to participate in the presentations of the others. Our own presentation gave me a concrete experience of how the role of the teachers manifests itself in this particular environment. Participation in the other presentations has also contributed greatly to my experience of the role of the teacher. (MIL10-FC-reflections-February)

Figure 5.36. MIL10 Group "MILOVIOLA" presenting inworld.

In terms of reflections on the MIL10 students' learning outcome, the domain-practice alignment, and other aspects of the communities of practice framework were highlighted as well:

> The module has provided very means to achieve the learning goals. There has been great variation, and the amount of self-directed learning in the group has been very rewarding. Personally, I've become more humble towards steep learning curves; now I really realize what it means to be a newbie. The best part has been to spend time with a committed teacher in a stimulating environment with helpful fellow students. (MIL10-FC-reflections-January)

> It has quite frankly been fantastic to have a teacher who knows how to scaffold in a clear manner :-) I've learned how important it is for me to participate in learning processes with others, but also that I need to decide on my own whom I want work with. As a learner I probably don't like serendipity, and I need a clear goal. It has been very rewarding to be able to transform theory to practice. (MIL10-FC-reflections-January)

> I've learned something about the role of the teacher; if you signal that IT problems are normal, then it becomes an acceptable condition. If you additionally show great patience, then the experience becomes even better. On a personal level, I've discovered how much the physical aspect means to me. It has been interesting and important that there was material in FC about the didactic considerations behind the course. The dialogic aspect. This has worked very well, and this is something I have learned a lot from. (MIL10-FC-reflections-February)

The students' predominantly positive experiences of the course module were also expressed in the electronic survey the students completed in relation to this cycle. As mentioned in chapter three, the MIL administration developed and sent out this survey, which consisted of 13 questions. Eight out of 11 students completed the survey. The students were able to evaluate different aspects based on a scale of six possible answers, ranging from Very much (1) to Not at all (6).

The questions focused on the following 13 aspects (MIL evaluering, 2011):

1. Your own degree of participation in the module?
2. The module design regarding alignment with goals concerning knowledge?
3. The module design regarding alignment with goals concerning skills?
4. The module design regarding alignment with goals concerning competences?
5. Pedagogical approach regarding alignment with learning goals - planning at the seminar?
6. Pedagogical approach regarding alignment with learning goals - execution at the seminar?
7. Pedagogical approach regarding alignment with learning goals - planning virtually?
8. Pedagogical approach regarding alignment with learning goals - execution virtually?
9. Literature regarding alignment with learning goals?

10. The module at the seminar - overall?
11. The virtual part of the module - overall?
12. ICT integration in the module?
13. Your degree of an optimal learning outcome?

As teacher, I was generally delighted to see that in all questions but one (nr. 6), the student satisfaction was between Very high (1) and Satisfying (2). Furthermore, as researcher, I was also pleased with a 100% Very high score in relation to questions nr. 3, 7, 8, and 12.

5.5.9. MIL10 REFLECTIONS

The research interest in this final cycle was in many ways a continued study of previous design elements (SL as VLE, activities, and the inworld assignment/assessment method). I did, however also study if/how a better overall domain-practice alignment could be achieved by making SL a learning goal in itself, and by adjusting details in relation to the other design elements. In general, this was the most successful course/research cycle: we managed to establish a good balance in terms of the polarities, and as we saw the student satisfaction was very high.

The data show that SL needs to part of the learning goals in order to design for truly meaningful learning experience, and furthermore that consciously addressing SL and its features in all other design elements is just as essential. Based on my data, it is difficult to point to the most important design element, rather it becomes clear that responses to design can be found on many different levels and in relation to different aspects. I also find it noteworthy, that these MIL students, who were used to predominantly asynchronous communication and interaction, reaction in such a positive manner towards the transformation to a more synchronous study mode. It would seem, based on my data, that the students are willing to accept less study flexibility, if meaningful synchronous learning processes are gained instead, as expressed by these students:

> This synchronous way of teaching and learning has been emancipating compared to the China Box system consisting of more of less reflected theoretical posts that lack direction anyway – BOOM! (MIL10-FC-reflections-February)

> In this module, I've experienced the essence of MIL's ideal in terms of learning, and that has been good learning for me as a student and as a teacher. The synchronous presence of other avatars has promoted the theoretical/didactical content. Completely new perspectives on teaching and learning. (MIL10-FC-reflections-February)

Figure 5.37. MIL10 students discussing the participation-reification duality.

5.6. SUMMARY OF THE RESEARCH CYCLES

From the onset of this study, my main research interest was concerned with the avatar phenomenon and how this virtual representation might influence the students' responses to teaching and learning in the 3D virtual world, SL. Nonetheless, during the first research cycle, I found that the avatar phenomenon could not be fully understood devoid of context, devoid of the rest of the pedagogical design. Consequently a second research question emerged, and in concordance with the dual imperative of AR, I identified new problem solving interests throughout the remaining research cycles. In this section, I summarize the findings related to design actions taken and reflect on the consequences by proposing a set of recommendations for design in SL. In practice participants respond to many different aspects of a design simultaneously, but in each research cycle I chose to pinpoint specific design problems that I wanted to try to remedy and study in more detail.

5.6.1. DESIGN ACTIONS IN MIL07

In MIL07 there was no problem solving interest to begin with, as I did not know what to expect in terms of the students' responses to the use of SL as virtual learning environment. I deliberately chose to apply a respectful design strategy with no principles to guide the design other than using the original design of the course. This meant that SL was approached as an analytical object, rather than a virtual learning environment. As we witnessed, this strategy quickly proved unsuccessful in terms of the students' experiences of SL and interventions were necessary. Five communal, but

optional meetings inworld were arranged and in the last part of the course a communal MIL place was established. There was hardly any inworld stewardship and on the whole the students were left on their own to make sense of the new virtual learning environment. While learning about SL as a virtual learning environment was not a curricular goal as such, the students expressed frustrations over lack of meaning, and in particular lack of meaningful activities inworld. If anything this research cycle demonstrated that respectful remediation of a pedagogical design without any changes whatsoever, is an unwise strategy.

5.6.2. DESIGN ACTIONS IN MIL08

In MIL08 the problem solving interest was related to the lack of inworld participation and consequently the lack of meaning that the students had experienced in MIL07. I decided to maintain a respectful design strategy, but with more radical elements. As an example I planned Tours to locations in SL, where the students could experience activities or inworld objects Not Possible in Real Life (NpIRL). The seven design principles originally proposed by Wenger, McDermott & Snyder (2002) were transformed to match SL, and I added two new principles based on the initial empirical findings. One principle concerned the avatar that I found needed more attention as it quickly became obvious that this phenomenon could not be treated as any other user-representation. The purpose of focusing on the avatar as a crucial part of the design was by and large an attempt to support the students' experiences of meaning in this virtual environment. The second principle was directly related to the problem of lacking participation, and as a way of enhancing student participation I designed eight different activities that were offered to the students in a flexible manner, resulting in a total of 25 communal sessions of which the students were asked to participate in at least one. Other design actions were the establishment of a communal MIL inworld place and a communal MIL inworld group, and both actions contributed to the students' positive experiences of being part of a community of practice in SL.

In terms of SL stewardship, I collaborated with two guest facilitators who offered the students a possibility to learn how to build inworld and thus master SL on a functional level. Other than this, I designed specific activities (Get-off-to-a-good-start and Tours) that were meant as sessions that also could contribute to the students' mastery of SL and overall understanding of the world. The SL features used in this cycle primarily revolved around the avatar and the build-in communication tools in SL.

The SL alignment with the curricular goals was better than in the previous cycle, not least due the Didactic Design Discussions that were used to discuss and in many cases experience, in a grounded way, theoretical points and concepts from the course literature. The two Your Tour sessions also revealed a potential in terms of genuine student participation. In the MIL08 cycle the FC environment still dominated as learning environment, however, and this was criticized by the students who asked for even better alignment with SL in future courses.

5.6.3. DESIGN ACTIONS IN MIL09

In the MIL09 cycle, the problem solving interest was targeted at solving lack of inworld reification possibilities and I also wanted to ensure better inworld stewardship. The design strategy was still quite respectful in terms of adhering to the original pedagogical design, but I was able to experiment with a new course assignment and assessment method that could ensure better alignment between SL and the curricular goals through inworld reification. This experiment resulted in a new activity called Your Presentation. This activity was optional, but almost all students choose it indicating that it also made sense for the students. In this cycle, I also developed two new design principles. The first principle was directly related to inworld reification, and besides a new assessment method this was also reflected in the inworld activities. As an example, the students were asked to participate in one mandatory Newbie Night where they had to learn how to create and manipulate inworld objects, and the SL features that we used in several of the other sessions were extended to include building tools. The second principle was concerned with technological stewardship and as a consequence of this I decided to invite a co-facilitator, Mew. The amount of communal sessions was reduced, while a communal MIL inworld group for communication was maintained. In this cycle, I borrowed an entire island from my Polish colleagues, and this also meant that the students had designated inworld places where they could experiment and later present their didactic analyses. This was the first research cycle where an acceptable balance between SL as analytical object and SL a learning environment was achieved. The importance of the FC learning environment had been reduced, and the students, Mew, and I spent more time inworld than in FC.

Despite the MIL09 cycle being the most successful pedagogical design in terms of learning outcome and student satisfaction, I continued being worried about the huge amount of time the students (and I) needed to spend inworld to ensure meaningful teaching and learning processes. As already stated, I would probably have stopped my research in SL had the MIL programme not adapted a revised curriculum in 2010.

5.6.4. DESIGN ACTIONS IN MIL10

In the final MIL10 research cycle, the curricular change meant that I was able to make the course assignment and the assessment method developed in the previous cycle mandatory. It also made it possible to change the course literature so that it better reflected teaching and learning in 3D virtual worlds. In comparison to the original course design, this was the most radical remediation. I only developed one new design principle related to domain-practice alignment. The total number of communal inworld activities was reduced, but I developed another new activity targeted at the students' inworld presentations called Presentation Exercise. I did not have the possibility to invite an official co-facilitator in this cycle, but as it happened one of the students, Inge, was extremely helpful as technology steward throughout the course. In this cycle, I had no island, but was able to use a large sandbox (building area), where the students and I

could experiment with building and other activities. For the student presentations, Inge was kind to lend her fellow students some of her sandboxes, and some of the students found free sandboxes on their own.

As it was the case in the MIL09 cycle, the students' own presentations, proved to be the most successful activity in terms of learning outcome. Contrary to the previous cycle, in MIL10 the presentation was mandatory and due to the changed curriculum, there were no apparent design conflicts between the domain specific demands, the learning goals and the actual practice in SL. Based on a thoughtful design strategy, a set of 12 grounded design principles, and a curricular change which made SL a legit learning goal in itself, this MIL10 cycle was by far the most rewarding and enjoyable course for both the students and I.

5.7. SUMMARY OF DESIGN FINDINGS

As part of my study, I developed a research interest in how I would be able to design for learning in manner that would facilitate meaningful participation and reification for students in SL as expressed in research question two. The first part of my empirical work provides some of the answers to this question:

- An overall respectful remediation strategy with no changes whatsoever is not recommendable. However, it should be noted that respectful elements in the design (e.g. respectful and thus recognizable activities) are recommended, especially in the beginning of a course in SL. In general, a balance between respectful and radical (e.g. the use of NpIRL) design elements is recommended.
- The development of a conceptual design model and corresponding pedagogical categories has been fruitful in terms of keeping an overview of the many elements of a pedagogical design.
- Wenger, White, and Smith's (2009) three pairs of polarities have proven successful in terms of analysing the state of an inworld community of practice.
- Likewise, design principles based on the communities of practice framework have shown a promising potential in terms of ensuring meaningful learning in SL.
- The seven original design principles created by Wenger, McDermott & Snyder (2002) were, nonetheless, insufficient in terms of capturing all aspects learning in SL.
- Design principles based on theory therefore need to be revised according to participants' responses and the empirical setting (SL).
- Five new design principles were developed to better facilitate meaningful learning in SL.
- Activities in SL need to be aligned not only with curricular goals, but also with the possibilities SL has to offer as a virtual learning environment e.g. by using the communication and building tools. The most popular activities, the

Didactic Design Discussions and the students own presentations, which both focused on the subject matter or domain additionally allowed for the students to become active participants and take control over their own learning practice. Communal as well as individual activities are also necessary in terms of establishing a sense of belonging to a community and a sense of individual becoming.

- While reification does not necessarily need to be materialised in virtual objects, my data show that asking the students to build and interact with inworld objects enhances their experiences of meaning. As such, one could argue that having land in SL is imperative, also because it allows for the teacher to show and not just tell. Furthermore, having a designated inworld place adds to the sense of belonging to a community.
- Due to the complexity of SL as learning environment time allocated to mastering the environment, incl. the avatar is essential for both students and the teacher. The use of a technology steward (other than the main teacher), and design of dedicated technology sessions is highly recommended. It should also be noted that acclimatization is not only a technological matter, but also a cultural issue that needs to be addressed.
- Finally, the role of the teacher needs consideration. Even though the students in this study were used to and often preferred to learn on their own with the teacher as a coach or facilitator on the side, in SL the students asked for a more traditional and instructional teacher - at least in the beginning of the courses. This shift in the role of the teacher, and consequently the role of the students as legitimate peripheral participants, needs to be addressed in the design as well. In an open-ended, social world such as SL, the teacher as designer should not be underestimated.

When looking at the five central recommendations I derived from educational research in SL in chapter two (section 2.3.3.), this first part of my empirical work is very much in line with previous research. As we saw, there seems to be consensus that design in SL needs to 1) align activities with goals, 2) use inworld tools/features, 3) focus on NpIRL, and 4) allow for acclimatization. Based on my data, I am able to refine these recommendations and add further design principles. In previous research, the most central aspect of SL, the avatar phenomenon, which I have not dealt with in this chapter, has also been emphasized as the point of departure for design in SL. My data are in concordance with the importance of the avatar, and this phenomenon must be taken into consideration before making further conclusions and recommendations regarding design.

CHAPTER 6. RESPONSES TO AVATAR-MEDIATION

In this chapter, I present the second part of my empirical work that concerns the avatar phenomenon. I present two central aspects of the avatar: its appearance and its behaviour and how the MIL students responded to these aspects. These findings, which are based on data from all four research cycles are analysed in light of previous research regarding the avatar. I summarise the students' responses and make recommendations for design. I the final section of the chapter, I combine these findings with those in the previous chapter and propose a framework for 3D remediation of pedagogical practice,

6.1. CENTRAL ASPECTS OF AVATAR-MEDIATION

Throughout all four research cycles, the avatar phenomenon remained a constant object of interest. Despite differences in the courses, and differences in how the avatar was perceived, all students agreed that what sets a 3D virtual environment apart from other learning environments be it face-to-face or 2D, is the avatar. As one of the MIL07 students put it:

> It's simple: the avatar is the central point in SL, because it is through the avatar we experience the world. (MIL07-FC-discussion-December)

The influence of the avatar is well known from the literature, and the students' perceptions confirm Taylor's (2002) findings on the avatar as one of the most powerful artefacts in virtual worlds:

> They [avatars] prove to be the material out of which relationships and Interactions are *embodied* (…) At a very basic level, bodies root us and make us present to ourselves and to others. Avatars form one of the central points at which users intersect with a technological object and embody themselves, making the virtual environment and the variety of phenomena it fosters real. (Taylor, 2002, p. 41 – original emphasis)

This section of the chapter will focus on two central aspects related to being mediated as avatars. As we shall see, "the avatar is not simply a uniform that is worn" (Yee & Bailenson, 2007, p. 274), but it constitutes the virtual world users' entire self-

representations, changes their behaviour, and it challenges the users at an ontological level, even before logging in to the world.

Two dominant aspects of the embodied avatar experience are highlighted, the appearance and the behaviour. In relation to each aspect, the students were challenged to make existential choices and virtually live with the consequences of these choices. This new way of being and living virtually posed a constant tension between the physical world (RL) and the virtual world (SL). On the other hand, the avatar-mediation greatly influenced the students' perceptions of presence and co-presence and for the vast majority in a highly positive manner. Appearance and behaviour are highly intertwined in practice, and therefore the division here mainly serves analytical purposes.

6.2. MIL STUDENTS' RESPONSES TO AVATAR APPEARANCE

In reflecting on her experience with SL, one MIL10 student wrote: "You could say that you start by remediating yourself" (MIL10-FC-reflection-January), and this process actually begins with the creation of the SL account. New users to SL are asked to choose an avatar from a variety of default possibilities, but are also told that the appearance is customisable. Figures 6.1. and 6.2. below show the development in choices there has been from 2007-2010.

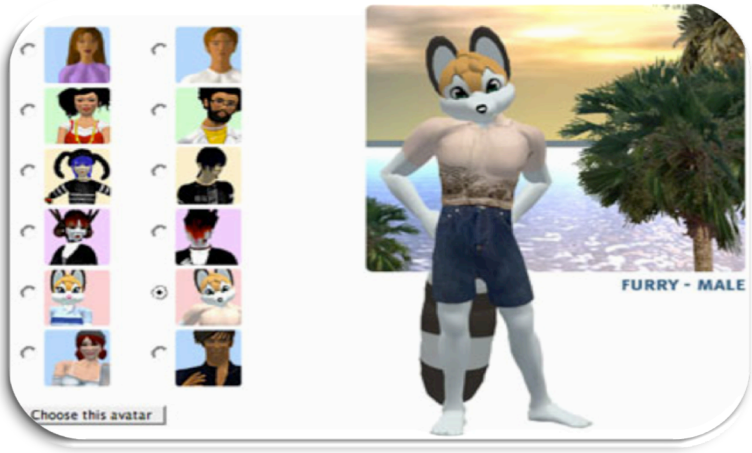

Figure 6.1. SL default avatars in 2007.

It is noteworthy that a default look from one of the SL sub-cultures, The Furries[67], was available in 2007, whereas all the choices in 2010 represent humans only. Though

[67] Furries are animal characters with human personalities and characteristics. Furries attend RL conventions, use multiple Internet sites/worlds, and also constitute a well-known community in SL (Boellstorff, 2008).

certain features may be customisable, important foundational aspects of the appearance such as species, gender, race, and age are limited when it comes to default choices. Taylor (2003) investigated how the underlying system design (code, graphics, architecture etc.) determines users' choices in virtual worlds, and how these design decisions reflect the designers' own "world visions", and states:

> Users find themselves engaging with a world that has been created with a particular vision of community, identity, and social life. While some worlds are certainly much more open than others (having less defined visions) ultimately all spaces carry with them values embedded by designers via code. (Taylor, 2003, p. 28)

As we saw earlier, the phrase "Your World. Your Imagination" has been denoting the users' freedom to create this new world, but even though SL/Linden Labs has become known for extending the users unprecedented control over almost all the content in the world, incl. the avatars' appearances, the possibilities are still restricted by system affordances, economy, time, and cultural, and social norms (cf. Taylor, 2003).

The MIL07 community was given no specific guidance to avatar creation, and even though the avatar appearance gained a lot of interest, the default look in itself did not cause much explicit reflection, except for this student:

> In the beginning, I met my twin [a similar default avatar], and I found this somewhat embarrassing and too newbie-like. On the other hand, I didn't want to reveal too much about myself and my own wishes of a personal appearance, so I chose a relatively anonymous avatar. (MIL07-FC-discussion-November)

For this student, the problem did not seem to be the underlying ideals behind the avatar appearances, but more a matter of being unique rather than default. In virtual worlds where users have to choose between default representations, this kind of reaction is quite common. Taylor (2002) explains:

> Establishing a unique identity then becomes tied up in naming and customizing an avatar. These two processes not only serve a personal function (individualization) but also a social function – it is easier to recognize and remember people over time. (Taylor, 2002, pp. 51-52)

Figure 6.2. SL default avatars in 2010.

In my observations, I noted that we did discuss the default appearance, but for the MIL07 community the general sentiment seemed to be an acceptance of the default appearances in line with all other system features as being a choice made by the developers of SL. The default avatar was looked upon as a sort of tabula rasa, and the ability to change the appearance almost infinitely, was generally appreciated.

However, because of the amount of attention the avatar phenomenon gained in the first research cycle by the MIL07 community, guidance to avatar creation was provided in the subsequent cycles. The underlying beauty ideals behind the default avatars became a topic in the MIL08 community. Several of the students, mainly female, were provoked by the "picture perfect" looks of the default avatars, and could (and would) not identify with that kind of body image, as commented by this student:

> At first, when I created my profile, I was provoked by all the default avatars. They had me thinking about Bratz, Barbie and Ken – what kind of beauty ideal is that? So I chose the ugliest avatar I could find, the "biker girl" with a helmet. Since then the avatar has undergone continuous changes, and is now "my" avatar. (MIL08-FC-discussion-November)

The default avatar appearance was a recurring topic, and in two of the inworld sessions, I noted:

> Especially, the women are provoked by the whole Ken & Barbie thing. The default appearance will most likely block identification with the avatar. For many students, SL conveys the impression of participating in a bad Hollywood movie, and there seems to be a cultural mismatch between this "Americanized" world, and the students. (MIL08-Obs-16/11/2008-Book2)

> I had a discussion with [avatar names] on the avatar looks and how this beauty ideal would affect younger students. There's clearly a fear that this could promote and maintain stereotypical body images, and there seemed to be frustration with the lack of imaginative avatar looks. I wonder how they will react to meeting Heidi. (MIL08 – Obs-17/11/2008-Book2)

The last observation was made before this MIL08 community engaged in "Building Class", where one of the teachers would be a female avatar, Heidi Ballinger, who often chose to represent herself as a panda bear. Heidi also had a typical, very good looking tall blonde avatar, but I had asked her to join us as the panda bear, precisely to observe how the students would react to such a radical remediation. The reactions were mostly positive:

> At first, I thought it seemed a bit unserious, why would she do that? But at the same time it was also fun. Better a panda than other strange creatures. (MIL08-FC-discussion-November)

> It was a bit difficult to relate to her in the beginning, but as soon as she started to teach, and she clearly knew what she was talking about, her appearance became less important. (MIL08-FC-discussion-November)

> As [student name], I recall the provocation [of the default avatars], and this is why it is quite liberating as a newbie to meet a serious figure like our panda-teacher. (MIL08-FC-discussion-November)

Out of all 53 students, all stayed true to RL gender, and only four male students, and two female students chose to join class radically remediated as non-humans (a wolf and a cat), and sentient objects (a teddy bear and a Smurf), or via different ethnicity. A number of explanations come to mind why so few students chose to make radical changes. First, it usually costs money to get a completely new avatar appearance in terms of skin. Free versions can be found, but in general finding stuff in SL can be quite challenging. In 2007, I did not provide the students with any money, whereas I typically gave the students between 500-1000 Linden Dollars in the consecutive courses and it is my impression that the money primarily was spent on hair and clothes for the human looking avatars, and on fun objects such as animated cars, coffee mugs, and fireworks.

Figure 6.3. Panda bear in action in the MIL08 Building Class.

Another possible reason could be that being remediated in itself, even as a human looking avatar represented enough of a challenge for most students – especially over such a relatively short period, where the students clearly prioritized spending their time learning the subject matter over getting acquainted with their new virtual representations. Furthermore, the possibilities for editing the default appearance are in fact abundant (cf. Yee & Bailenson, 2007). Combined with a very generous "freebie-culture", this provides the user with countless possibilities for experimentation. It is also worth noticing that attempts at changing the avatar's appearance demands certain technical competences that take a while to acquire, and even the simplest changes can be troublesome, as expressed by these students:

> If you're not careful, you'll suddenly be wearing a house or something worse. (MIL07-FC-discussion-December)

> At a certain point, I tried to give her a new blouse, because it is getting rather cold. The result was that she got a very big bosom, and that was simply just not how I wanted to appear in-world – luckily my fellow students helped me, so that I could reshape her as a respectable woman. (MIL08-FC-discussion-November)

> It's my impression that I can't do the simplest things in SL such as putting on new clothes – something I learned and automated 50 years ago. (MIL09-FC-discussion-November)

Figure 6.4. The Appearance menu with different sliders for customizing the avatar.

As Boellstorff (2008) remarks, the SL interface is complex, and mastering all the different features can be very challenging, especially for newbies as this quote indicates:

> I [the author] recall sitting with a group of residents when one asked "so how do you tell a newbie?" Another resident responded "by the box on their head!" (Boellstorff, 2008, p.124)

Boellstorff continues explaining how some inworld items (e.g. clothes) often are sold within a prim (typically a box), and that newbies often find it difficult to extract the content, and thus end up wearing the box. Some producers of inworld content also offer free samples of their items, so that SL users can try out e.g. hair or clothes before actually buying it, and this service is also something that newbies often misunderstand – as exemplified by the MIL10 student in figure 8.7. below who showed up in class with new hair, and a box soaring over her head.

Figure 6.5. Student wearing sample hair, incl. a box.

Sometimes technical difficulties can cause changes that are more profound, as for this MIL10 student, who ended up changing ethnicity due to technical problems (figure 6.6. below). She explains how, but also why it turned out not to be a problem for her:

> I was quite satisfied with her, and I didn't think of changing her appearance/my appearance, until she became bold under the hat, which was the only thing that individualized her from the default avatar. In my search for the hair in my inventory, I accidentally found a Bollywood outfit that I tried to put on. It was a coincidence, and then again maybe not. As a child I lived 5 years in India, I've often been wearing Indian clothes, played, and been well integrated in the Indian culture. It also added to my comfort that I received several compliments after my change. (MIL10-FC-reflection-January)

A MIL09 student, who started out by choosing an avatar of different ethnicity, later regretted this choice, and changed it:

> In the beginning she was a woman with beautiful brown skin, but as I discovered too late also with many tattoos (and in the beginning in the experimental phase she was also very fat and very small). And I didn't know that you could just put on new skin, so I put on a high-necked t-shirt under the jacket, so that you couldn't see the tattoos that definitely weren't good looking. Over time, she has become whiter, and the tattoos have disappeared under the new skin. (MIL09-FC-avatars)

Figure 6.6. Ethnicity change MIL10.

Again, due to technical issues, SL users now and then experience another particular phenomenon, which has to do with the avatar graphics not rendering properly and results in the avatar looking like a particle cloud[68]. During one of the student presentations in MIL09, one of the participating students was unfamiliar with this phenomenon, and wondered if the two participants he saw as clouds in the audience were doing it on purpose to illustrate points on legitimate peripheral participation (which was the topic of the presentation), and he commented on this afterwards:

> As you know, I thought there was a point in Mariis and [avatar name] "dressed up" as legitimate peripheral participants – that would have been really well designed ;-) (MIL09-FC-discussion-December)

Despite the obvious humorous part of this statement, it is also clever insofar as my observations show that users experiencing this phenomenon usually feel frustrated, and sometimes even left out of the community. Re-logging can usually solve the problem of not fully loaded avatars, but it goes to show that students can be quite sensitive when it comes to appearance, and the "strange behaviours" of the avatar.

[68] Up until viewer 1.20 the loading avatar looked like a woman dubbed Ruth, and the phenomenon was so common among SL users that it was referred to as being "Ruthed".

Figure 6.7. Clouds in the audience.

Notwithstanding initial technical difficulties, the majority of the students in all four research cycles took great interest in changing and reflecting on their new virtual appearances. This interest in personal (albeit avatar-mediated) appearance puzzled the students:

> I'm very fascinated by the avatar concept and spend my first hours in Second Life nursing my avatar so that she could be a worthy representation of me online. I've been quite amused by my own vanity, and the fact that this apparently also is an issue in virtual worlds. (MIL07-FC-discussion-November)

> In the process of changing the appearance of my avatar, I realized that I felt it was important that the avatar resembled my physical self as much as possible. (MIL07-FC-discussion-November)

> I wanted to look like myself as much as possible. I've always hated role-playing parties, and so why should I look any different from myself? (MIL08-FC-discussion-November)

> It is interesting how you identify with your avatar and feel foolish when you look strange. (MIL09-FC-discussion-November)

> I'm probably what you would call an "augmentationist", because I want her to look normal and to be an extension of me. (MIL10-FC-reflection-January)

These quotes indicate that self-verification may be another explanation as to why the majority of the students chose and maintained respectfully RL-human avatars. Self-verification theory (Swan, Chang-Schneider & McClarty, 2007; Swann, 2012) claims

that people are likely to maintain a consistent self-concept, conveying a truthful image of themselves. The lot of the data in this study confirm this claim to a large extend. In numerous sessions inworld, throughout the research cycles, we discussed the students' needs to appear as realistic and true to their RL identities as possible. The main[69] arguments were related to credibility and trust both on a personal and a professional level.

One study in SL with a similar target group of university students, found that the vast majority chose human avatars, with gender and ethnicity traits related to their RL identities (Conrad, Neale & Charles, 2010). Another study by Messinger et al. (2008) found that SL users customize their avatars to bear resemblance to their RL appearance, but with moderate enhancements. No reports on user experience was made in this study, but given my own observations, I would stress user prerequisites, and system affordances as additional explanations. Messinger et al. found that the majority of respondents reported their avatar-age "same as RL" and the authors speculate that the respondents' RL young age (with the majority < 35) could explain this (Messinger et al, 2008, p.9). However, in trying to explain these choices, I would also take into account that lack of system possibilities to alter the avatar's age (e.g. it's impossible to create wrinkles on default skin) force users to accept (more or less willingly) a younger appearance. In several inworld sessions (in MIL08, MIL09 and MIL10), I noted students complaining about the young default appearance. Given that the students in this study match the general profile of MIL students with an average age of 45 having a twenty-year younger looking avatar may well pose a challenge and even block identification.

Young, attractive looking default avatars are common to virtual worlds. Yee & Bailenson (2007) note that in one of the predecessors to SL, the virtual world There.com[70], old people did simply not exist, since it was impossible to create older looking avatars. Ducheneaut et al. (2009, p. 3) found "several SL residents aged 40 and above had avatars looking like teenagers or young adults ", while Diehl & Prins (2008, p.110) found the majority of SL users had similar appearance, but looked like they did "20 years ago or without the wrinkles". Nakamura (2010), who has researched gender and racial issues in virtual games and virtual worlds, opposes the widely held utopian belief that new, digital media eradicate former inequalities and leaves the user free to choose any appearance (with all that that entails), by remarking (as Taylor, 2003) that the developers of these virtual environments in fact limit the freedom of choice:

> Digital profiles and avatars that are produced by users encourage the sense that one is producing one's "self" without any type of constraint or limitation, such as gender, size, body shape, or skin color—thus avatars have often been

[69] More profound psychological motivation, such as avoidance of intrapersonal conflicts (by projecting a fake or radically altered self-image), has not been a focus in this study.

[70] There.com closed in March 2010, but later reopened with a different pricing model.

> celebrated by scholars and users alike as ideal entrepreneurial spaces for identity formation. However, avatars are often constructed from a fairly narrow range of faces, bodies, and features. This creates a normative virtual body, one that is generally white, conventionally attractive, as well as traditionally gendered, with male and female bodies extremely different in appearance. (Nakamura, 2010, p. 338)

Regardless of system affordances and stereotypical default avatars, when provided with the opportunity to virtually redesign your identity, self-verification may not be as obvious or desirable as in other settings/situations. In her seminal work on online identity, Turkle (1995) found that online spaces provide unparalleled opportunities for identity play, and this has since been confirmed in numerous studies (e.g. Chester, 2004; Bessiere, Seay & Kiesler, 2007; Blascovich, & Bailenson, 2011). In a related manner, Nakamura (2000) introduced the concept of "identity tourism" to describe the appropriation of another online identity, and more specifically, an identity involving another gender and/or race than one's own. Ethnographic studies of SL users in general (as opposed to users entering SL for educational purposes) also confirm the inclination towards experimentation with appearance (Au, 2008; Boellstorff, 2008; Jensen, 2008).

Turning to quantitative findings, a survey on user acceptance of SL based on 250 respondents, Fetscherin & Latteman (2007) listed five main motives, and found that the majority (66%) entered SL primarily to meet new people, but among the same respondents, 37% listed "change identity" as the fifth motivator, and obviously, the two responses are not mutually exclusive. An additional 2007 survey among 479 SL users found that the majority chose to represent themselves inconsistently from their RL identities with 24% choosing a different nationality, 23% choosing a different gender, and 22% choosing a different race (Au, 2007b). In the aforementioned study by Ducheneaut et al. (2009) avatar personalization in three different virtual worlds[71], incl. SL was studied, and the authors found:

> It is clear that avatar customization is a very important activity in SL compared to the game-based virtual environments - in fact; one could even argue that avatar customization *is* the game in SL. (Ducheneaut et al., 2009, p. 3 – original emphasis)

Then again, Ducheneaut et al. (2009) also note some very large standard deviations in all three worlds meaning that while some users choose to spend significant time (with a mean of 93 min/week for SL users) on customizing their avatars, others do not seem to care at all. In addition, the study concludes that "extreme differences between physical and virtual selves appear to be rare in a variety of online spaces." (Ducheneaut et al, p.7), and this aligns well with the MIL students' general approaches.

[71] Besides SL, this included World of Warcraft (gaming world), and Maple Story (socializing and gaming).

Despite the relatively limited desire to experiment radically among the MIL students, the data from this study shows that creation of a new, virtual avatar-based identity challenged many of the students, and this is consistent with other findings based on similar target groups in SL, i.e. faculty (Savin-Baden, 2010), and university students (Childs, 2010). Most of the MIL students were surprised how self-conscious the avatar made them, and they were clearly struggling with defining this newfound self-interest. Was it superficial vanity or something more profound? Especially in MIL07 and MIL08 the "vanity issue" was big. Hereafter, I chose to address appearance and identity issues more explicitly in preparing the students for this part of the inworld experience, and that seemed to change their overall perceptions. It is however interesting to observe how some of the students struggled with the (quite common) wish to be represented by a "worthy" avatar, as expressed in the examples below:

> Vanity is dominant in SL. We want the hair to look good, the clothes to fit, and everything has to be a worthy representation of us. (MIL07-FC-discussion-November)

> I did not want to spend too much time on it, I felt a bit silly spending time on a "paper doll", but perhaps it is not such a bad idea to let lose your inner child and reflect a bit on your "own" appearance. (MIL07-FC-discussion-December)

> With the avatar, the intra-personal intelligence is brought into play with our "vanity or self-reflection". (MIL07-FC-discussion-December)

> When I meet people on the Wonderful Denmark Island, they tell me I look like an ugly version of Simply Red. But I think vanity IRL is transferred to SL. And since I (according to my wife) am not vane IRL, I don't feel a need to be vane in SL … I think. (MIL08-FC-discussion-December)

> I think my time is too precious to be spent running around to find stuff for a – excuse the expression – paper doll. (MIL08-FC-discussion-December)

> I don't appreciate the idea that you have to pay to make your avatar look better. I get the idea that you pay for land that you can build on, but the whole self-promotion idea in relation to the avatars is a bit "the Emperor's new clothes" – hey, it is 1's and 0's that disappear as soon as you log off or loose the Internet connection! (MIL08–FC-discussion-December)

On the other hand, one student speculated that interest in the avatar appearance could be something other than superficial vanity:

> For SL-residents, I think there is a certain respect connected to the avatar-"look". The more cool and hot an avatar appears, the more IT-competent the user is in SL as in IRL. (MIL08-FC-discussion-December)

While vanity cannot be ruled out, studies also show that interest in the avatar appearance often is closely related to skills and knowledge (of the user). Jensen has studied avatar representations in both virtual game worlds (2007) and social virtual worlds (2008). In SL, she describes the avatar as a personal medium, and finds:

> The avatar is the visible manifestation of whether the actor behind it has put an effort into becoming part of the virtual society. Whether time and effort has been spent to become acquainted with the fundamental skills that are required to convey a personal expression, but also the knowledge necessary to circulate among others in the virtual world. (Jensen, 2008, p. 68 – my translation)

On many occasions, especially in the MIL07 and MIL08 cases, the students were surprised, and some were provoked at how often the avatar appearance found way into inworld conversations. However, as Jensen (2008) further explains, in SL it is ok to ask about clothes and design, because it shows interest and recognition. Moreover, since SL is not a game, putting time and effort into one's appearance could be seen as this environments' levelling mechanism (cf. Ducheneaut et al., 2009). My personal observation is that talk about appearance is akin to RL talk about weather (which is not really an issue in SL[72]), a way of small talking, and every so often, it functions as a conversation starter. Further, there is mostly a genuine interest in learning more about design and acquisition of e.g. skin, clothes, or hair.

Dwelling on technical proficiencies of the users, Huvila et al. (2010) also found that SL users, who engage in designing inworld content e.g. buildings, clothes, and skin, score high in terms of social capital, and this confirms my personal observations. During my time in SL, I have a few times encountered users, who clearly did not want to talk to me, because I was not part of the "building community". Having said that, I do believe that the most common sentiment is that what really matters, is whether you contribute to the community or not – and this contribution could include social actions and/or economic ditto i.e. through purchase of inworld objects, and thus directly supporting those who do choose to design.

Elaborating on identity issues, another observation is that mainly the female students reflected explicitly on the avatar appearance, whereas it seemed less interesting for the male students. The male students did not hold back in changing appearance, rather they just were not particularly overt about their choices, and their thoughts. In the MIL10 community, identity issues became an explicit part of the curriculum, and as mentioned in chapter five, I invited a colleague, Dr. Mark Childs, to join us inworld to discuss different identity and avatar issues based on Childs' PhD-dissertation on this particular topic (Childs, 2010).

[72] Default weather in SL is always good. Some SL users do experiment with creating different environmental/weather settings, most often to enhance a certain ambiance, and in these cases "weather small talk" would typically evolve around design issues.

In this session, Childs and I showed the students how to easily shift between different avatar appearances[73] to spark the discussion, and after the session, one of the male students, who had been very quiet, reflected on his experience:

> Meeting Mark Childs was – strangely – the most extreme experience I had in SL. I was completely silent during the whole session despite that it was the most relevant topic of all, identity. I really wanted to say a lot, but perhaps because I didn't feel we got to know each other well enough in the introduction, I did not have the courage to share my thoughts. So much of our interaction has been focused on professional topics, and here we were suddenly talking about identity, and phases you have gone through, style of clothing that you have had in different stages of your life. Things you normally only discuss with close friends. (MIL10-FC-reflection-January)

Figure 6.8. Demonstrating different avatar appearances in the MIL10 Class.

In a similar vein, I noticed how reluctant another male student in the MIL10 community was, when I tried to ask him about his new appearance:

> I bumped in to [avatar name] this afternoon in the sandbox. He has clearly taken an interest in his avatar's appearance. I tried to get him to talk about it, but he seemed a bit shy, and I didn't want to push him. "Yah, you know ... I didn't want to look like a newbie, but it is a bit silly". And then he excused himself and hurried off … (MIL10-Obs-06/01-2011-Book4)

[73] In this session Dr. Childs also used one of his alts. In general, the use of alts was not a topic that gained much attention in any of the four research cycles.

Gender differences have not been a specific focus in this study, but the observations do seem to indicate that female students preferred RL-human avatars, whereas the male students who experimented with the appearance did so in a more playful and radical manner and this is consistent with the findings of Ducheneaut et al. (2009) and Wiese (2009). However, as one of the male students expressed, there is a difference between being an explorative student, and being a professional:

> If I were to use SL in relation to my work, then I wouldn't choose an avatar with orange hair or a Smurf. I would choose one that better fits the situation. (MIL08-FC-discussion-December)

In all four cycles, there was consensus about the importance of having the avatar appearance reflect the specific use, and the specific context. This was not only a matter of conveying an appropriate impression, but also a matter of taking advantage of this particular affordance of the medium. Possible gender differences and situational/ contextual aspects aside, the data clearly confirms, that the avatar appearance forced the students to engage in identity reflections and discussions.

For those students who took a strong interest in the avatar appearance, personal attributes became popular, as this student explains:

> It is not accidental that [avatar name] is wearing red, because it is one of my favourite colours. The Hawaii-flower used to be my favourite flower, so I put it behind the ear, when I found it as a "freebie". (MIL08-FC-discussion-November)

As an additional example of the use of personal attributes in figure 8.11. below one MIL10 student chose to wear a distinctive hat – just as he does RL. In fact, the data shows that the use of attributes is the most common (and easy) way to display personal traits and interests.

Figure 6.9. Personal attributes.

Attributes can also be used as a way of signalling professional affiliation, as exemplified by one of the MIL10 students, who RL is engaged in Nurse Education, and quite often showed up in class wearing hospital clothing. To establish shared identity and connection, a group of five male students in the MIL07 community, all decided to wear a similar big red and white hat. The creation of an inworld MIL group with accompanying group tags (cf. chapter five) was another way showing shared identity. For some RL companies, who have chosen to have a presence in SL, handing out company-clothes and other merchandise as freebies is quite common, as we experienced when visiting the Danish engineering company, FLSmidth[74] in the MIL08 cycle.

Showing affiliation and establishing community through the avatar's accessories and animations is consistent with findings from predecessors to SL. Similar behaviour was found by Schroeder, Heather, & Lee (1998), who investigated religious practices in Active Worlds. In addition, Taylor, who looked at practices in several virtual worlds, remarks:

> In each of these cases, performing oneself through the avatar and using it as a vehicle to express participation and connection with others has been central to the creation of a vibrant world. (Taylor, 2002, p. 47)

[74] FLSmidth is leading supplier of equipment and services to the global cement and minerals industries.

Figure 6.10. Properly dressed at FLSmidth.

As we shall see in the section on behaviour, different identity issues are as previously mentioned closely related to the behaviour of the avatar both individually and socially speaking, and not only to the appearance. Yet, before turning to this, the data also tells us something interesting about another important aspect of the avatar appearance: the names.

When signing up for the SL account, new users are not only asked to choose avatar appearance, they also have to choose names for the avatar. New users are told, that they can choose any first name they like, but it has to match a surname from a predefined list[75], and if you are unlucky, the combination that you wish for can be unavailable. Essentially this means that all new users have to get used to new, and as for the surnames; often English sounding names[76].

During the course of the MIL10 cycle, Linden Labs chose to change their policy on names, making it possible for users inworld to choose and show whatever name they desire, a new feature called "Display names"[77]. From my observations inworld, I have noticed that only a few of my inworld friends and colleagues have chosen to change names with this new possibility. It should, however be noted that the ability to use RL

[75] The predefined list changes over time, meaning that only a certain number of avatars get to share a common surname. Meeting another avatar with a similar surname is by many SL users considered as a kind of family relationship or kinship, and it reveals a commonality in time for entering SL.

[76] As of May 2011, Linden Labs again changed their naming policy making it possible for new users to create names non-restricted.

[77] The "Display name" feature was launched by the end of October 2010, but did not affect all regions at once (Linden, 2010). In the MIL10 case, this feature became apparent approximately two weeks into the course on December 11th 2010.

names has been a wish from many users in some parts of the SL community. In SL mailing-list for educators and researchers I noticed, the RL vs. SL name issue was heavily debated in the early years of SL, but then faded. The problem is that many residents (regardless of how well connected they are) do not know each other's RL names, and as such would not be recognized, if they decided to change (cf. the identification issue in Taylor, 2002). In the MIL10 community, only one student chose to change his name, when this option became available, but the change was mostly phonetic, making his avatar name sound more like his RL name.

The MIL07 community was given no particular instructions related to avatar creation or choice of names, and names were hardly mentioned by the students in this community, but observations from inworld show that the students struggled with their new, often bizarre names:

> When I met [student name], I tried addressing him by his avatar name both in the text-chat and by voice, but he did not respond. I ended using his RL name and asked him jokingly, if he was ignoring me. He laughed and said something like "No, but I didn't realize that it was me you were addressing – I'm still not used to that name". The same thing happened, when I met [student name] in the sandbox yesterday – she was very confused about the name thing. (MIL07-Obs-26/11-2007-Book1)

> In tonight's visit to WD, Doctor Asp addressed a couple of the students, but they never realized that he was talking to them. I need to address the name issue in the future. (MIL07-Obs-04/12-2007-Book1)

> Even in this final session, I noticed that the students called each other by RL names. (MIL07-Obs-17/12-2007-Book1)

Especially in the MIL07 community, security issues and identity theft were concerns expressed by the students, and for these reasons many of them created very exotic names that revealed little or no connection to RL people and some names were quite difficult to pronounce and spell. For that reason, it was no surprise that the students found it difficult to relate to that part of their new identity. Table 6.1. next page provides an overview of the students' avatar names and their resemblance to their RL names. In the MIL07 community, three students never disclosed their names, and even though I met two of them inworld, I failed to note their avatar names[78]. Therefore these three students are not included in the table, and thus explains why n=19 in MIL07, and n=50 in total.

[78] Due to inexperience with both the environment and with participant observation in the first, MIL07 research cycle, I noted the students RL names in my field notes.

	RL name	RL name resemblance	No RL name resemblance
MIL07 (n=19)	3 (15, 8%)	5 (26, 4%)	11 (57, 8%)
MIL08 (n=12)	2 (16, 7%)	3 (25, 0%)	7 (58, 3%)
MIL09 (n=8)	1 (12, 5%)	5 (62, 5%)	2 (25, 0%)
MIL10 (n=11)	1 (9, 1%)	3 (27, 3%)	7 (63, 6%)
Total (n=50)	7 (14, 0%)	16 (32, 0%)	27 (54, 0%)

Table 6.1. Overview of avatar names' resemblance to RL names.

Across the four research cycles, seven students (14%) chose to maintain their RL first names for their avatars. While names were not discussed in detail in the MIL07 cycle, the four students from the other cycles explained this choice with ease of memory, and ease of recognition. In MIL08 one student who chose to keep his RL name, was asked by one of the other students to elaborate on this choice, and explained:

> Yes, I chose my own name because of convenience, didn't have much imagination to create a more exceptional name, I just wanted to get started quickly when I signed up. Afterwards, I've become fond of my name – it eases things in relation to the course. I find it difficult to remember who is hiding behind some of your cryptic names and find that in relation to a learning context it would be better to maintain the student's own name. (MIL08-FC-discussion-December)

Jones (2005), who participated in a research project in Active Worlds (AW), also noted that the names of the avatars was an important issue, and he remarks the continuing interest in being able to recognise, who is behind the avatars names:

> The concern with names was persistent and the project participants were very keen to know the real identities behind the avatar. Exchanges took place that either established or confirmed a participant's offline name and identity and associated it with the avatar. (Jones, 2005, p. 419)

The case reported by Jones was based on text communication. In the MIL cases, we were able to use voice in all four research cycles, which did contribute to the students' abilities to recognise each other. However, since MIL students only meet face-to-face

for a couple of days four times annually, they were not necessarily familiar with each other's voices, and I recognise the name/identity confirmation issue from my observations. Another MIL08 student, who chose a name with a clear RL resemblance by adding two letters to her RL first name, agreed on the convenience aspect:

> Several of us have chosen because of convenience - [her avatar name] – this I can remember, and I also use it in other places on the internet, and it is sufficiently close to my own name, so I don't feel completely alienated. (MIL08-FC-discussion-December)

Sixteen MIL students (32%) chose to create names with some kind of resemblance to their RL names. This could include part of their name(s), abbreviations, contractions, and/or by addition/subtraction of one or more letters as in the example above (none used numbers). A couple of students explained their choices:

> Ciao Ragazzi. I'm now in SL as [RL name changed a bit to sound more Italian]. I feel like an Italian, and love everything Italian, and this is also why I'm dressed in my new Ferrari t-shirt. Tanti saluti. (MIL08-FC-avatars-November).

> Her first name is a contraction of my own names. Her last name is Gartner, partly inspired by Howard and his theory on learning, which was a big mantra in my time at Teacher College, partly because I love to spend time in my garden, when I'm not sitting by my computer. (MIL09-FC-avatars-November)

The majority, 27 students (54%), chose to create names with no resemblance to their RL names. Again, this did not mean that their names were not related to RL at all. Six students deliberately chose names related to the MIL programme[79] to show affiliation. One student, who worked at FLSmidth, chose "Cement" as his first name, and gave an elaborate explanation:

> I created my account in relation to my work and so it had to be something with cement. Based on my own limited logic, the surname then had to be something with C and I chose the first name on the list that met this demand. Afterwards, it makes sense to me that I can sign shorthand by writing CC, which in an e-mail perspective signals that the message not necessarily is directly meant for me/the receiver, who only is Cc'ed – and if I flip that line of thought, I can create distance to my avatar by naming him (or perhaps Cement is a woman inside?) CC in situations where I don't concur completely with him or when I want to signal that Cement and [student's RL name that also starts with a C] are not identical. (MIL08-FC-discussion-December)

[79] First names: Miling, Milo, and Milano, and surnames: Milena, Milena, and Miles.

Another student who also chose a name with no apparent RL resemblance explained that it was a name, she also used in other Internet services, and that part of it in fact was one of her nick names (MIL08-FC-discussions-December), and this was also the case for one of the MIL10 students:

> The name [avatar first name] has followed me as user name for years, and so of course this should also be my name in SL … The surname [avatar surname] was chosen … well, because … it fits well with [avatar first name] … it resonates well ;) (MIL10-FC-avatars-October[80])

Research into avatar naming in virtual worlds is limited. Nonetheless, in a paper on legal rights for avatars in virtual worlds, de Zwart, Collins & Lindsay (2008, p.3) investigated SL users and found "many examples of residents whose name match their inworld interests and activities as indicated by inworld group membership." While showing affiliation and interests through avatar naming may be a conscious choice for some SL users, the authors speculate that this is not always the case:

> In Second Life, the most salient signals are resident name and avatar. The user characteristics and attitudes that a resident name points to may be obvious as in the cases noted above, however, in most cases, the relationship between the signal and the user characteristics and attitudes signaled is less obvious to the onlooker; the relationship may not even be apparent to the user for, as discussed below, resident and avatar attributes may represent projection of the user's unconscious self. (de Zwart, Collins & Lindsay, 2008, p.3)

Even as the majority of the MIL students' names had no apparent resemblance to their RL names, the data shows the chosen names did in fact relate to other RL issues, and contrary to the proposition by de Zwart, Collins & Lindsay above, the students seemed to be very conscious about their choices. Again, it should be noted that MIL students signed up for SL with a specific, professional use in mind, and this may be different for users who sign up more randomly. A survey based on 172 respondents among students enrolled in SL (Conrad, Neale & Charles, 2010), showed that 43% chose avatar names that were identical with their RL names, whereas only 14% of the MIL students chose RL names. In the same study the authors found that 32.6% chose names different from RL, and despite lack of explanation for name giving in the survey, they hypothesize:

> Although the majority of students surveyed chose names for their avatars identical or related to their own names, nearly a third chose names apparently unrelated, as if conscious of the difference between their own subjectivity and that of the avatar, and therefore stressing the distance between these

[80] As explained in chapter five, in the MIL10 cycle, the students were asked to create and introduce their avatars before attending the kick-off face-to-face-seminar that was scheduled more than a month before the actual course start in December.

> subjectivities as a barrier against the melding or confusion of these senses of self. (Conrad, Neale & Charles, 2010, p. 7)

The data from my study does confirm that the students were aware of the distance and sometimes even discrepancy between their RL identities and their avatars. Nonetheless, it is my analysis that the students' conscious choices of including some sort of RL resemblance or relevance into naming their avatars combined with a vivid use of attributes could be understood as attempts to in fact establish closer relations, rather than maintaining distances to their avatars. This is consistent with findings from other virtual worlds. Schroeder & Axelsson (2001, cited in Schroeder, 2011), who interviewed ten long-time Active Worlds users, confirmed this individualization of the avatar through the naming process:

> In contrast to avatar appearance, the names used by the interviewees are more often individual choices and creations. The chosen name may resemble a real-life name or have a connection to real life experiences, or it contains certain status signs or letters that have particular connotations for initiated users. (Schroeder, 2011, p. 160)

Interestingly, this also seems to be the case in other types of virtual worlds such as the role-playing game World of Warcraft, where Guitton (2010) analysed 1261 avatar names, and found:

> The choice of a name is one of the steps in the process of individualization of the avatar, and thus enters into the process of embodiment. Despite the apparent freedom of character creation process, the virtual characters are far to be totally disconnected from the players. (Guitton, 2010, p. 1775)

In a pilot study based on 11 students' interaction in SL, Truelove & Hibbert (2008, p. 365) state that the importance of choosing the right name in SL has been underemphasised, and they conclude that the most "powerful but intimidating aspects of Second Life" for the students was the issue of identity, and this is definitely in concurrence with the MIL students' experiences. As we move on to the MIL students' impressions of avatar embodied behaviour the challenges the students faced and the need for avatar-enculturation becomes even more apparent.

6.3. MIL STUDENTS' RESPONSES TO AVATAR BEHAVIOUR

> Users do not simply roam through the space as “mind”, but find themselves grounded in the practice of the body, and thus in the world. (Taylor, 2002, p. 42 – original emphasis)

An important part of the behavioral aspects of the avatar experience starts with the user's choice of point-of-view (POV), which determines how the user sees, but also interacts with the virtual space he/she embodies. The POV influences how "grounded" the user actually feels, and in SL two different POVs are possible, and figures 8.13. and 8.14. next page show these basic views.

In figure 8.13. I am standing in my sky-box, and it appears as if I am looking through the eyes of my avatar. This optional, 1st person POV is commonly known as "mouse look" because the view follows the movements of the mouse, creating what the MIL students referred to as a hand-held experience. In this POV, text communication is not possible, but the advantage is the flexibility in view angles, and it is typically used in relation to building inworld objects.

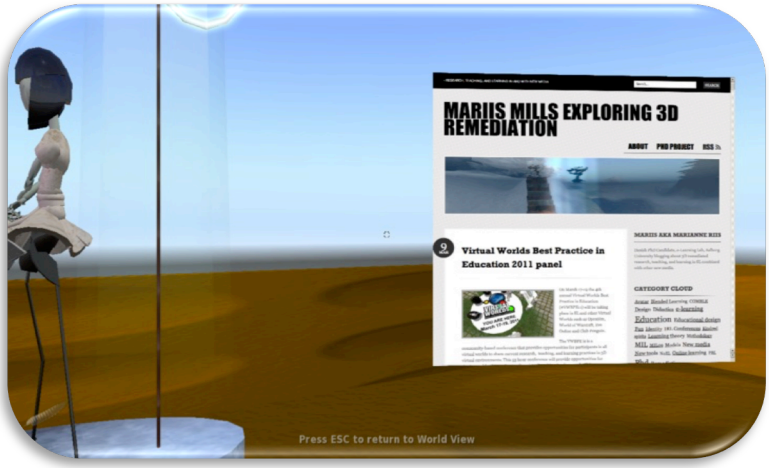

Figure 6.11. 1st person POV - optional.

However, when a user logs into SL, the default POV is the 3rd person perspective as shown below, where my avatar is standing in the exact same position, but now I see the environment from slightly above and behind my avatar.

Figure 6.12. 3rd person POV – default.

The 3rd person POV provides the user with a variety of options as illustrated in figures 6.13. and 6.14. Besides looking from behind my avatar, I can choose to view from the side (shoulder) or the front, and as shown in figure 8.15. I can zoom in or out.

Figure 8.13. Zooming in and out from my avatar position.

In figure 6.14. below I can orbit the camera around my position, viewing from above and below. The ability to move the camera independently of the avatar position makes SL unique from many other virtual worlds (Wadley & Ducheneaut, 2009).

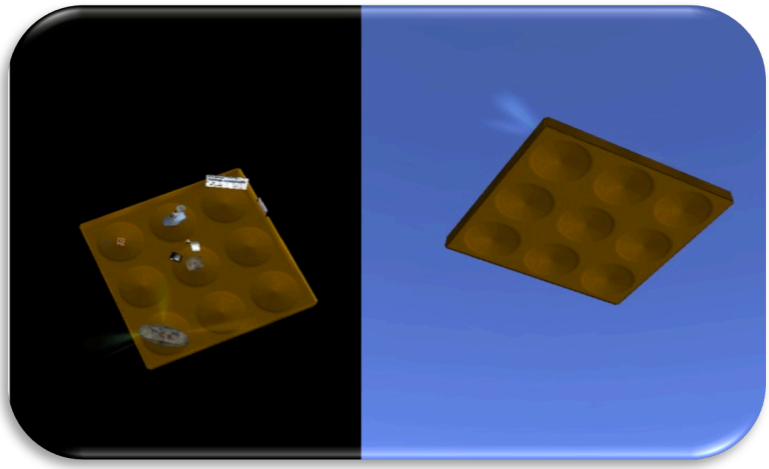

Figure 6.14. Viewing avatar position from above and below.

Essentially, the avatar-independent (or detached) camera means that avatar position becomes irrelevant to the user's view, however, as with other features it takes time to learn and control these options, and most newbies are unaware of these. Just as a "misplaced box" (cf. figure 6.5.) is a clear sign of a newbie, avatars complaining about blocked view or avatars positioning themselves close to a particular object in order to see better, are also typical signs of newbies. In accordance with this, Turkle (2011, p. 217) reports of an experienced SL user, who refers to the knowledge and mastery of the detachable camera as an "expert privilege". During the inworld sessions in the MIL08, MIL09 and MIL10 cycles, I often asked the students which POV they were using, and the most common reply was the 3rd person perspective, and this preference is consistent with findings from several studies in different virtual worlds. Kallinen et al. (2007) investigated player preferences in a gaming environment, and found that despite the fact that 1st person POV was related to a higher degree of immersion, users preferred the 3rd person POV, because this generated a greater sense of control over the avatar and the environment. Another study, conducted in SL by Schuuring & Toet (2010), confirmed this perception, and better control and overview in the 3rd person POV were also the main arguments among the MIL students.

The main difference between 1st and 3rd person POV, is that in the latter the user sees her avatar – also when she moves[81]. What is interesting here is how the POVs affect the user's sense of embodiment. Cleland (2010, p. 85) argues that seeing oneself as avatar creates a "profound split in subjectivity and experience of the self", and

[81] Here it is important to notice that the detached camera mode and 1st person POV are two different things. If a user chooses to be in the detached camera mode, his/her avatar does not move, and this explains why this mode often is referred to as an "out-of-avatar" experience (Wadley & Ducheneaut, 2009; Turkle, 2011).

concludes that the 1st person POV therefore must be considered as an embodied perspective, whereas she considers the 3rd person POV to be disembodied. As well as Kallinen et al. (2007), Cleland finds the 1st person POV provides the most immersed and immediate experience, and refers to a user in a 1st person POV game, who became motion-sick while playing (Cleland, 2010). A few of the MIL students also discussed physiological effects of the virtual experiences. In MIL08 one student was puzzled by the nausea she sometimes felt inworld, especially, when she used 1st person POV. She compared the experience with watching movies that are shot hand-held, and she speculated that this experience was triggered by lack in orientation, partly due to her inability to master her avatar's movement, but also due to poor design:

> (…) But I also know that part of these nuisances because of the "hand-held" experience that SL sometimes gives me, are caused by what you could call "non-avatar-friendly" buildings and surroundings. For example, it is my experience that in the buildings that imitate regular architecture it is often difficult to get into the building, move around in it etc. (MIL08-FC-discussion-December)

Another student, who worked in the Air force, recognized the problem:

> The phenomenon is well known in "my world", where it is possible to get airsick from being in a flight-simulator. It has something to do with the brain accepting the visual input as valid and ignoring the kinesthetic information that you de facto are sitting completely still in a chair. It can take up to 24 hours for the brain's balance center to recuperate, and this is why you are not allowed to fly a real aircraft until after one day. I don't know if the same hold true after a flight in SL, but perhaps it is something we need to consider if SL and similar 3D worlds gain influence as "regular" learning environments. (MIL08-FC-discussion-December)

Intriguing as it was, physiological effects such as motion sickness have not been a focus in this study, and it did in fact seem to be an isolated phenomenon[82]. Design aspects aside, the sense of embodiment was often praised by the students, and it was recognized as one, if not the, defining characteristic of 3D virtual worlds. However, in contrast to Cleland's previously mentioned perception of the connection between POVs and embodiment, the data from this study shows that embodiment was not restricted to the 1st person perspective. Every so often the students (and I) literally bumped into each other, and this typically resulted in comments like "oops, sorry", and

[82] However, quite often during all four research cycles, the students and I discussed how surprisingly tired we felt after the typical 2 hours sessions, and this could be explained by the concept of *cognitive overload*, which can be a problem in rich, multi modal settings (Mayer & Moreno, 2003).

given that the majority of the students preferred the 3rd person POV, the sense of embodiment was also apparent in this mode.

As Morie (2007) remarks, in RL we not only have a kinesthetic sense of our bodies, we are also perceptually aware of them (e.g. by seeing our noses or moving limbs in our field of view), but in 1st person POV in SL, there are no such clues. The only indication of having a body in this mode stems from audio; there are certain built-in system sounds such as sounds of walking and running, sounds associated to landing, teleporting, and typing, and a crash-like sound if your avatar walks into things. These system sounds are, however, far from natural sounding, and it takes a while for newcomers to decode the sounds and make the connection to their avatar movements. For newcomers, it seems that the most important indicator of embodiment is the visibility of the avatar, which also could explain why Linden Labs has chosen the 3rd person POV as default.

Having a virtual body, and especially being visible in the environment was considered unique to this 3D environment, as the examples below indicate:

> I do believe that the avatar offers a more intense sense of presence and visibility than what we experience in e.g. FirstClass and BlackBoard. (MIL07-FC-discussion-December)

> The effect of having a representative is that I experience this with more emotion and body than in FirstClass. It is almost like being there myself and I discover that my body reacts to the things that are happening to me, e.g. when I'm drowning under "Storebæltsbroen" [a Danish bridge] on Wonderful Denmark or when I land a little too hard after flying. (MIL07-FC-discussion-December)

> It [the visibility of the avatar, ed.] creates a new sense of presence. (…) I felt it immediately when I first rezzed on the Orientation Island. I've never been in a 3D online world before, avatars were moving around, others were present as avatars as I was, and it was a very strange feeling. I also think it is also a different feeling to chat in SL than chatting in Skype, where you are only represented by your voice. (MIL08-FC-discussion-November)

The MIL students highlighted the avatar-mediation in all research cycles, but even though the students mostly perceived the avatar as a positive aspect of SL, they also acknowledged that this feature added to the complexity of being and learning in this type of environment. Part of this complexity stemmed from difficulties in movement of and navigation with the avatar. Just as changing the avatar's appearance was considered a challenge, learning how to manage the simplest movements like sitting on chair, walking through a door took, or animating basic gestures (e.g. booing, crying, or

laughing), took time. Sometimes intended actions resulted in surprising outcomes as depicted in figure 6.15.

Figure 6.15. Sitting in unexpected places.

More sophisticated movements, e.g. dancing, swimming, or doing tai-chi, can also be activated, and are highly treasured among many SL users: however, for newcomers the mere idea of animating your avatar can be beyond comprehension, as expressed by this student, who comments on the possibility of using RL experience in an attempt to interpret avatar interaction:

> In RL I can rely on many different experiences to interpret what's going on. That is far more difficult in some of the places where I've been in SL. One time, I really was in doubt, was in one of the nightclubs, I kindly was invited into. Here I have not yet been able to interpret what's going on, is it an exercise in avatar movement, or is it really a place where people dance with each other? (MIL07-FC-discussion-December)

As we shall see later, avatar interaction generally posed a specific challenge to the students. The use of animations was, however, not only a matter of decoding interaction, but also seemed to reflect the students' individual perceptions of embodiment. In the MIL09 class, my co-facilitator, Mew Aeon arranged a session focusing on different degrees of immersion, and as part of this he took the students dancing.

Figure 6.16. MIL09 participants dancing.

After the session, one of the students explained how she and one of her fellow students felt:

> We have talked about how exhilarated and happy we were after having danced with Mew on Organica Happy Clam Island on Monday, and even without a hangover or neck pain afterwards. It is surprising how physical an experience it was to dance! (MIL09-FC-Meta-reflections-December)

Meanwhile, another of the students had a different experience:

> Funny, I felt quite the opposite. Completely empty inside – and without the joy I usually experience when dancing (which I do a lot). (MIL09-FC-Meta-reflections-December)

On the whole, the MIL students were not particularly interested in the more sophisticated animations and gestures as these were mainly viewed as funny, often times strange, and sometimes even uncanny[83] aspects of the experience. Nonetheless, the more advanced ability to fly, gained a lot of interest. Most students found this way of navigating the world very useful both in terms of getting an overview and in moving faster. However, often when we were out touring the world, flying resulted in students getting lost, and so flying mainly became an individual choice.

[83] In 1970 roboticist Masahiro Moire, speculated that robots should not be made too similar to real humans because such robots can fall into the "uncanny valley," where too high a degree of human realism would evoke an unpleasant impression (Seyama & Nagayama, 2007). Once the robots became closely humanlike, Mori argued that people would be so distracted by the ways that the robots were *not* human, that they would find them creepy instead of appealing. Although contested, the "uncanny valley" is a well-known and discussed phenomenon in the field of 3D animations/worlds also (e.g. Slater & Steed, 2002).

In cases where students got lost, the ability to teleport was greatly appreciated, even though this feature also caused some initial confusion insofar as the students often offered teleports instead of asking for them, which would result in the opposite of what was desired.

Another aspect of avatar movement that attracted quite a lot of attention, especially in the beginning of all four courses, is a feature known as being away from keyboard (afk). "Being afk" is a default mode that is automatically activated if the user leaves her screen untouched for a couple84 of minutes in which case the avatar will bend over and a text saying "away" appears in the tag over the avatar's head as illustrated in figure 6.17.

Figure 6.17. Being "afk".

Boellstorff (2008) studied this phenomenon thoroughly and explains that the term "afk" can indicate that the user literally is doing something else in RL, but it can also mean that the user is preoccupied with something else inworld, e.g. communicating via private instant message. Because many users often are inworld for prolonged periods of time and are engaged in many different social inworld contexts, occasionally going "afk" is widely accepted. The default feature can be deselected, which many experienced users do, but that does not refrain SL users from using the term that has become an integrated part the social jargon and behavior (cf. Boellstorff, 2008).

On the other hand, in an educational context, being visibly preoccupied may not be as well accepted. In many cases, the MIL students expressed confusion, concern, and even embarrassment when their avatars suddenly "fell asleep". As an example of this, one of

[84] This can be changed to 5, 10, or 30 minutes – or it can be completely deselected.

the MIL09 students apologized for having been involuntarily "afk" during one of the sessions, and reflected on her experience:

> One of the things you have to get used to is that you don't have full control over your avatar's body, e.g. it bends over and gets the sign "away" over its head, if you let it sit still. (…) I think – if you want to teach in SL – you need to be aware that the avatar's body language isn't consistent with that of the student. I could imagine that I would think that the students were sleeping or had left to get a cup of coffee, while I was speaking. (MIL09-FC-Meta-reflections-December)

The basic skills regarding camera and avatar movement are not particularly complicated, but there are quite many options, and given that the vast majority of the MIL students had no prior experience with interaction in 3D virtual environments, the mastery of the avatar's movements became an additional challenge. One could argue that it always takes time for newcomers to master a new practice, and that SL is no different from other environments in this regard. When the MIL students enter the programme's regular 2D platform (FC), it also takes time before they feel confident in using that. Nonetheless, as we have seen, there is a very important difference between the two types of virtual environments. In a conventional 2D virtual environment, interaction is disembodied and to connect with others, the students can rely on their prior experience with written communication, whereas in a 3D environment, such as SL, the avatar movements and behaviour cannot be disregarded, and simply takes time to learn.

Besides movement, another important aspect of the embodied experience is how the user chooses to communicate. In SL, it is possible to communicate both via text-chat and via voice, separately or simultaneously. In SL, the option of voice communication was not implemented until August 2007, and when it was announced[85] it brought about protests by various SL communities, including SL users who identified as deaf (Boellstorff, 2008; Carr & Oliver, 2009; Carr, Oliver & Burn, 2008). Without diminishing the discrimination issue, and with reference to the immersion-augmentation debate (cf. chapter four), Carr & Oliver (200986) explain that "at the heart of these tensions was a debate over who it is that Second Life is "really for", and what Second Life is, or should be". Wadley (2008, 2007) investigated SL users' preferences and found that people using SL for teaching or workplace purposes generally preferred to use voice rather than text, but he also found that in practice SL discussions were often held in text, mainly due to technical difficulties and the wish to include as many as possible. Elaborating on those findings, Wadley, Gibbs & Ducheneaut (2009) concluded that voice greatly impacts people's experience of virtual

[85] Au (2007a) illustrates part of this debate that started even before implementing voice.

[86] Quoted from the paragraph "Defining *Second Life*, Describing Participation"

worlds, and that the controversy over its introduction into SL essentially reflected how much information people behind the avatars wanted to reveal.

As previously mentioned, we were able to use voice in all four MIL courses, and even though this often was supplemented by text, voice clearly was the preferred mode of communication for several reasons. In the initial sessions, most students had no clue who the avatars with strange names and appearances were, but they quickly got used to hearing my voice, and as the courses progressed they also learned to recognize each other's voices. There was definitely a safety and trust aspect related to the use of voice, and this is consistent with the abovementioned study by Wadley, Gibbs & Ducheneaut (2009), who found that "voice-refusers" sometimes encountered suspicion from other users, who found this behavior somewhat covert.

Second, many students were not fast typewrites, and many clearly struggled with figuring out the difference between local chat, group chat, and instant messages. Moreover, text-chat is very different compared to the asynchronous discussion form that the students were accustomed to from working in FC. As reported by Yee et al. (2010), text-chat in general has its own distinct lexicon, grammar, and usage conditions. In a study among 76 students in SL, the authors (Yee et al., 2010, p.6) found that SL users employ abbreviations (e.g. U for you), Internet acronyms (e.g. LOL for laughing out loud), emoticons (e.g. <3 for the heart symbol), and ever so often pronouns were dropped (e.g. busy now instead of I'm busy now). Add to this that the common language is English combined with specific SL jargon (e.g. SLurl for links, griefer for trouble-maker, avi for avatar, tp for teleport) and participation in a general SL text-chat becomes quite challenging for English-as-second-language newcomers. This particular problem with text-chat was mainly an issue when we were out exploring the world[87]. Further, as was noted several times by the students, text-chat due to its short sentenced almost punch-line form and ephemeral[88] nature may not be the best mode for academic discussion anyway.

General distinctions between different communication modes and types of media have been thoroughly researched within the field of computer-mediated communications (CMC), and in many ways the distinctions in SL are the same as in other types of media. Then again, in SL there is a unique possibility to visualize action through animations, and this has also been used in relation to communication. In both voice and text mode turn taking can be a challenge, but in SL, there are built-in indicators that literally show when and how an avatar is trying to communicate.

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[87] The problem became most apparent in the MIL08 case, when we visited *The Metanomics Show* and *Science Friday* – two venues that are known for a highly engaged audience that enjoys practicing "constructive cacophony". For the majority of the attending students the cacophony remained unconstructive and they quickly left and excused themselves because of "lack of meaning".

[88] The chat can of course be logged, so this only refers to the actual communication situation where there is a limited time to reflect before responding.

In figure 6.18. next page the green waves above my avatar's head, and the more subtle movements of her lips visually indicate that she is speaking, whereas the avatar on the right is shown doing a typing animation[89]. Other more sophisticated non-verbal animations and gestures can be acquired, but this has not been a focus in this study. As previously mentioned, the MIL students generally perceived this kind of avatar behavior as funny or strange. Nonetheless, studies among other students in SL have showed a positive correlation between the use of animations and gestures, and the students' perceptions of immediacy and presence (Lawless-Reljic, 2010, Anderson, 2009).

Figure 6.18. Visible indicators of speaking and typing.

Despite these visible indicators, turn taking remained a challenge, and as stated by Nilsson et al. (2002) users of computer-mediated communication generally have to put more effort into expressing what they mean and often need to be much more explicit than in face-to-face communication. In SL, part of these challenges stem from the fact that users watch from individual and publically invisible POVs, thus making common orientation clues like "on my right/left side" more or less meaningless. Over time, the students and I developed new communication strategies, and in general the combination of avatar presence, voice and text was unsurprisingly considered much richer than the communication in FC. Another important aspect of the communication in SL was that it tended to be less formal than in FC, and this was something the students often highlighted and appreciated.

[89] To add to the complexity, this typing animation can be deselected, and from my observations this is more common than not. Further, when engaged in instant messaging or group-chat only the avatars involved get indicators of typing. Essentially this means that avatars seemingly doing nothing could in fact be engaged in a vivid, but publicly invisible conversation.

Avatar embodied behaviour and communication also relates to social interaction. Time and again the students were out touring the world on their own, and even though the students often reported of deserted places, they did encounter other avatars and thereby new challenges. First of all, acknowledging that there are humans behind the avatars can be difficult as expressed by this student:

> We have met many interesting "humans" through their avatars. As an example my avatar met a Norwegian avatar, which said that "it" wanted to create a library in SL. (MIL07-FC-discussion-December)

Moreover, when the avatars are recognized and accepted as human manifestations, human emotions such as shyness suddenly appear:

> I haven't really succeeded in talking to anybody, but that's my own fault. I don't think having an avatar makes it any easier. So far my avatar is shyer than me!! It didn't feel natural until we met in the group. (MIL07-FC-discussion-November)

> I'm surprised how much I identify with the avatar and how shy I feel when I meet strangers. (MIL10-FC-reflection-January)

> I feel uncomfortable when I, as a newbie, explore new places on my own and meet more or less strange creatures :-) I've reflected a bit on this and I think it is the combination of being a visible newbie and being so clumsy (lack of control?). (MIL10-FC-Didactic Discussion-January)

Despite the anonymity provided by the avatar, many students expressed a high degree of shyness towards meeting strangers, and this seems to be partly due to self-consciousness in relation to being newbies, and partly due to lacking knowledge of social norms and behaviour in SL:

> Walking up to someone in the town square on WD is also extremely strange. I REALLY wanted a presentation of the others, and I wanted to present myself. The question in my head was: How do you talk to somebody, you don't know at all? What are they normally talking about here? Do they know each other? (MIL07-FC-discussion-November)

> When I'm in the town square, but don't know the others or when I don't have anything to contribute to the conversation, I usually sit on the bench. I find it to be the most neutral position. It is not logical to sit down in SL because you don't need to rest the avatar! But I can see that others do the same, when they don't know what to do with their avatar (that is if they experience it like I do). (MIL07-FC-discussion-December)

The MIL students' impressions are consistent with a study of social behaviour in three different virtual worlds, where Becker & Mark (2002, p. 36) found that "people report being uncomfortable by their lack of knowledge of the conventions." It is my impression that especially the MIL07 students toured the world and tried to connect to others because of the lack of scheduled activities in that course. Nonetheless, in all cycles, the students were confronted with meeting strangers, and a couple of explanations come to mind as to why this evoked uncertainty among students. Contrary to virtual games there is no predefined purpose to being in SL, and contrary to their regular learning environments (both FC and the University), SL is not a "walled garden", which means that the students knew that they would also encounter people/avatars who were not part of their own community and who were not necessarily in SL for formal, educational purposes. Further, as Boellstorff explains, in SL the common way of connecting to others is through friendship:

> [Yet] the cultural concept of "friend", defined by its two characteristics of choice and egalitarianism, represented the dominant rubric residents of Second Life (and beyond) drew upon as the default category for social relations. (Boellstorff, 2008, p. 157)

Especially in the early stages of my research, 2007-2008, offering friendship to almost anybody you met was considered normal and to some degree a standard courtesy, and in many cases this was regarded as one of the more sympathetic traits of the inworld interaction. For some MIL students the friendship practice was closely related to the "spirit of the SL community" and it was linked to the openness and helpfulness that most of the students experienced in their inworld encounters. Then again, for other MIL students the idea of "friending" strangers surpassed their personal borders, and every so often, the students asked me how they could refuse friendship offers in a polite way. According to Schroeder (2011), encounters between strangers are comparatively rare in RL, and so when friendship becomes the default mode for online social relations, this unsurprisingly will constitute a challenge for some users. Again, I think it is important to keep the purpose of the use in mind; the MIL students did not enter SL for social reasons, as this student explains in her final reflection:

> I want to choose whom I interact with. I don't have a need to small talk with the other avatars I meet – if fact, I've been quite reluctant in doing so (strange given that I talk constantly IRL??!). I think it has to do with the time perspective. I enjoy talking to my friends, and if they were there (instead of on Facebook), I would like to communicate with them in SL. But I'm meticulous when it comes to how I spend my time … (MIL10-FC-reflection-January)

Although the students in general acknowledged and highlighted the social potential of SL, the majority preferred to spend their time with fellow students, and even though this can be seen as a positive sign of highly focused students, I do think that uncertainty regarding social behaviour also influenced their priorities. Not knowing exactly what to

expect, the students were often surprised by behaviour in SL, both when they found it strange, but also when it seemed to be replicated from RL:

> Avatars act in concordance with the way we normally act in Real life (RL). This we saw in our meeting with Kip Yellowjacket; we all gathered around him, when he was talking, nobody stood with his or her backs to him. I've noticed this in other situations too where you try to keep eye contact, take for instance a regular evening in the town square on Wonderful Denmark. (MIL07-FC-discussion-December)

> We have the same need for personal "space" in virtual worlds as we do in the real world. In the virtual world we will try to avoid shuffling each other when we move, we will avoid walking into other people and groups, we don't want to be too close to each other when we communicate, and we'll move away if somebody gets too close to our comfort zone. (MIL07-FC-discussion-December)

Conformity to RL social norms and behaviour is quite common in virtual worlds. Friedman, Steed & Slater (2007) found that SL users display distinct spatial behavior and maintain certain levels of interpersonal distance when interacting with other avatars, just as a study by Yee et al. (2007) confirmed that users' social interaction in SL is governed by RL social norms. Further, another study by Harris, Bailenson, Nielsen & Yee (2009) indicates that SL users over time change their behavior and for instance revert to RL routines such as walking instead of flying or teleporting.

Nonetheless, sometimes the code of conduct does differ from RL. During one of the MIL08 visits, Phelan Corrimal from Rockcliffe University Consortium gave a talk when a stranger suddenly appeared in our midst. Normally in SL, when someone turns up (even unexpectedly) he/she will be greeted by the others, but not in this particular case. One of the students explained why:

> Suddenly an avatar who was out exploring, and who had "get kinky with me" in his tag, came into the teaching session. He didn't say anything, and he didn't do anything, he just walked around listening and exploring. None of us MIL students apparently reacted, but just continued unperturbed (at least on the screen) to listen to the interesting talk Phelan was giving … we all stayed in academic mode, despite this "new boy in the class". The alternative identity that this "new boy in the class" had chosen was apparently such a repulsive social behaviour that none of us present chose to greet him. I found it extremely funny, that he had chosen such a tag, and I was actually sitting all by myself laughing. (MIL08-FC-discussion-November)

This was also an incident that I reported in my field notes, because it made me feel quite uncomfortable, not so much due to the explicit sexual reference, but more so

because this clearly was an example of ignoring "the elephant in the room". In a later session, the students and I discussed the incident and how a few words in a tag had affected all of us, and how because our host did not react, neither did we. As it turned out, we were all surprised by this lack of reaction (MIL08-Obs-27/11/2008-Book2).

Nevertheless, in SL the best way to deal with so-called griefers can be to ignore them. Griefing as a way of irritating, harassing, and thereby ruining other players/avatars' inworld experience, is a well-known phenomenon in all types of virtual worlds, and according to Foo & Koivisto (2004) griefing is but one of many motivations to enter virtual worlds90. In SL, Boellstorff (2008, p.187) points out that "the question of when an act counted as "griefing" was debatable", but typical examples could include anything from (often times jokingly) disruption of public gatherings, severe harassment of individuals e.g. by discriminatory behaviour and stalking, to regular "grid attacks" that would cause SL to crash for several hours.

From numerous talks with fellow educators in SL, I know that griefing was considered a serious problem, and this would explain why many educational inworld institutions often chose to close their facilities to the public. During the 130 hours of scheduled activities in SL that were executed in this study, we only encountered serious griefing once. In relation to one of the student presentations in the MIL10 class, we started the session in a specific sandbox, but soon after we arrived, we started having problems with lag, movement was impossible, our computer screens turned grey (cf. figure 6.19.), and eventually we were forced to re-log (MIL10-Obs-11/01/2011-Book4).

Figure 6.19. MIL10 class getting "griefed".

[90] In many ways, the motivation and behaviour of griefers is akin to so-called "trolls" in the blogoshpere and other SNSs.

Fortunately, in this MIL10 case, the "grief" was technical and could quite easily be solved by rebooting the island, but especially for the three students that were about to start their presentation, this was of course very disruptive. As Boellstorff (2008, p. 195) further notices "griefing as a form of deviant behaviour, only makes sense in the context of a code of conduct", and just as in RL, because there are so many different sub-cultures in SL, a common code of conduct across the entire Grid is non-existing.

Though our shared experiences of griefing in the MIL classes were limited, the students did report of individual instances where the students felt unease and disruption in their encounters with foreign avatars. These instances seemed to fall into two different categories, one of which could be labelled as "impolite behaviour":

> Yesterday, I was looking for some missing note cards and landmarks in my inventory, and while doing so, an annoying man kept "interrupting" by saying "hello" and "sorry". I changed my status to busy hoping that it would make him lose interest, but he didn't. So, instead I tried to quickly walk away from him, but that didn't help either … He didn't really do anything, but it was very disruptive while I was trying to sort through my coffin … I could have ignored this, but somehow it felt so real in SL despite the quality of the graphics and how crazy people appear or behave … (MIL10-FC-Didactic Discussion-January)

The second category could be labelled as "inappropriate" and would more often than not include sexual references:

> Approximately 2 min. after I landed on Orientation Island someone asked me if we should have sex – he thought I looked sexy!!! And of course I was just one of those default avatars!!! He/she asked for friendship, but I refused, and I thought that it was a good thing that I could easily log out if this was the general conduct!!! (MIL07-FC-discussion-November)

Sexual behaviour is part of the SL universe. Based on my discussions with the MIL students it is, however, my impression that instances like this one were rare. In many such cases, direct propositions were made by boundary-seeking newbies, whereas those users who were actually motivated to enter SL to explore sexual activities on a more serious level tended to stay in areas dedicated[91] to such interests. When the mainstream media coverage took off in Denmark in 2007, several newspapers[92] reported of SL as the new "sex place" on the Internet, and such coverage, which I believe was common in many other countries, clearly affected motivation to enter SL.

[91] It is possible to rate areas in SL "adult" or "moderate" in terms of content/behaviour.

[92] In August 2007, the Danish newspaper, Politiken (2007) ran a series of seven articles exploring SL, and these articles clearly focused on deviant behaviour with an emphasis on sex, escapism, commercialization, and other very negative aspects of the SL experience.

Especially during 2006-2008, there were several instances of so-called "flying penis attacks"[93], where griefers literally bombed public events with graphic animations, and evidently instances like those caused concern in many, more serious communities such as among educators. In preparing the MIL students for the SL experience, I naturally addressed this issue, and it seems that the MIL students mainly found sexual incidents funny or strange. In an article on what we can learn from mundane SL phenomena, Bell (2009) compares griefing to hacking, and finds that griefing for better or worse draws the virtual world users' attention to the possibilities that exist.

6.3.1. SUMMARY OF AVATAR ASPECTS

In the previous sections, the data have shown how central aspects of the avatar, its appearance and its behaviour, influenced the MIL students' experiences with being in SL. In terms of choosing names and appearance for their new, virtual representations the students in all four research cycles were clearly challenged in a number of ways. Getting used to an appearance that – despite attempts to remediate respectfully – was unfamiliar evidently took time and forced the students to make existential, personal, and professional choices. For this target group who came into SL with a professional, study-use in mind establishment of a professional appearance became essential to their experience of the environment, themselves, and each other. The time spent on getting the appearance right was arguably taken from time that could have been spent on learning the subject matter. However, the students' focus on appearance should also be regarded as a way of respecting and appropriating this kind of virtual learning environment's particular affordances. The second central aspect of the avatar, its behaviour, challenged the students to a great extend as well. While the avatar appearance to a large degree is a personal matter the student can struggle with on an individual and private level, the avatar's behaviour more often had public consequences (e.g. how to react when meeting others, how to accommodate to the SL cultural norms etc.).

During the course of all four research cycles, a few students (4/53) did, however, not appreciate the experience of the 3D-remediated pedagogic practice at all, not least because the mere idea of being represented by an avatar, and the fuss surrounding it surpassed their logic, as expressed in this student's summary of his experience with SL:

> Whether people want to play with paper dolls or if they have a need to make virtual social relations must be their choice. (MIL07-FC-discussion-December)

[93] In one of the more famous examples, SL-entrepreneur, Anche Chung was attacked during an in-world interview (Walsh, 2006), and this inspired young, Russian activists to play a similar prank on Russian chess-player, Gary Kasparov during a RL talk (Waxy,org, 2008). The latter being an interesting example of the cross-media potential of our new media experiences.

In these few cases, the avatar was at risk of becoming a barrier to learning. It also highlights the importance of designing for avatar-enculturation in educational contexts, as stated by this student:

> Whether you want to spend time on nursing your avatar or not, it is important that the virtual identity doesn't feel like a straitjacket, but that it gives the user space to focus on participating in the virtual world and the possibilities it offers in terms of social interaction and learning. (MIL08-FC-discussion-December)

In summary, we have seen how the avatar is a design element in SL that poses many challenges and calls for both extensive time and reflection for (most) SL users. For outsiders not familiar with the avatar concept it can be very difficult to grasp the phenomenon and not least why it poses such commotion. One student in the MIL09 cycle did, however, manage to explain it quite well:

> For a month now we have moved from being newbies with strange - if any at all – hair, from messing around with no control over ourselves as avatars or any knowledge of how to behave in SL, to now having pretty ok clothes and hair and a bigger understanding of the avatars' movements and possibilities, and an insight into the SL culture. It is a long journey, and a development that takes 20 years in RL. (MIL09-FC-discussion-December)

In traditional 2D virtual learning environments such as FC, students are able to rely on previous experiences and interact with others through well-known modes of communication and based on well-known cultural norms and conventions. In SL, one could argue that the students are forced to re-learn everything they know - a *second* time around.

6.4. SUMMARY OF AVATAR FINDINGS

My main interest in this study has been concerned with the avatar phenomenon and how this virtual representation might influence the students' responses to teaching and learning in SL. The second part of my empirical work, as witnessed in this chapter, provides some of the answers to the study's first research question. Previous research into the avatar phenomenon, and my data as well, emphasize the importance of the avatar as point of departure for (any) design in SL. In this section, I summarize the findings related to the avatar as a pedagogical design element and reflect on the consequences by proposing recommendations for avatar-mediated design in SL.

Notwithstanding the few students, who did not appreciate the 3D-remediation and the avatar at all, my data show how the students, in general, obtained a sense of presence through the avatar, a sense of being (as self) and a sense of being inworld together with others. Despite initial confusion, some students also reached a point where they felt

embodied and reacted to what ever happened to their avatar. In terms of becoming immersed, my data are less convincing. It seems as if several students did not strive for immersion, but rather identified as augmentationists and in some sense regarded SL as just another communication and learning tool, where they wanted to maintain a professional and respectful appearance and behaviour without the need to "suspend disbelief". In any case, my data show that the avatar is a powerful mediator, necessary to convey a sense of being identifiable to oneself and others. In this respect, the avatar becomes essential in relation to using a 3D virtual world as a learning environment. Furthermore, my data also show how the avatar forced the students to engage in identity-related discussions and reflections in a manner I have not experienced in more traditional 2D virtual learning environments.

Determining exactly how the avatar influenced the students' learning is difficult, however, in relation to the four central components in a community of practice, proposed by Wenger (1998), it is worth noticing that the avatar not only influences learning as becoming (identity) and becoming (community), but also in terms of learning as doing (practice) and learning as experience (meaning). Based on the findings, I would make the following general recommendations in relation to the avatar and its importance in a pedagogical design:

- Acknowledge the importance of the avatar. Regardless of how students perceive the avatar phenomenon, their learning process and outcome will be influenced by the avatar.
- Acknowledge the different perceptions of the avatar. Some students embrace the phenomenon, others do not.
- Allow time for avatar-acclimatization and enculturation.
- Design activities targeted at avatar customization (cf. appearance).
- Design activities targeted at avatar mastery (cf. behaviour).
- Design inworld teaching and learning spaces that are avatar- and especially newbie-friendly.

While learning in SL depends on the students' relationship with her avatar as it could either hinder or promote the mentioned dimensions of learning, we also witnessed in the previous chapter that the rest of a pedagogical design is just as important in terms of ensuring meaningful learning and hence the need to combine the findings.

6.5. A FRAMEWORK FOR 3D-REMEDIATION OF PEDAGOGICAL PRACTICE

Based on a combination of the findings from chapter five, the above-mentioned findings concerning the avatar, and theoretical considerations, I will end this chapter by proposing a framework for 3D-remediation of pedagogical practice. The framework consists of a combination of models and principles that could be used separately or together.

As part of the framework, I would suggest using the conceptual design model and the 12 principles developed, as my findings have documented their usefulness. To further enhance the use of the affordances particular to a 3D virtual leaning environment, such as SL, I propose that design for learning in a 3D virtual world takes into consideration three essential design components: avatars, activities, and arenas (the teaching and learning spaces inworld), and that these components are reflected in light of two dimensions, the respectful-radical remediation and the immersion-augmentation approach, as depicted in the design model in figure 6.20. below.

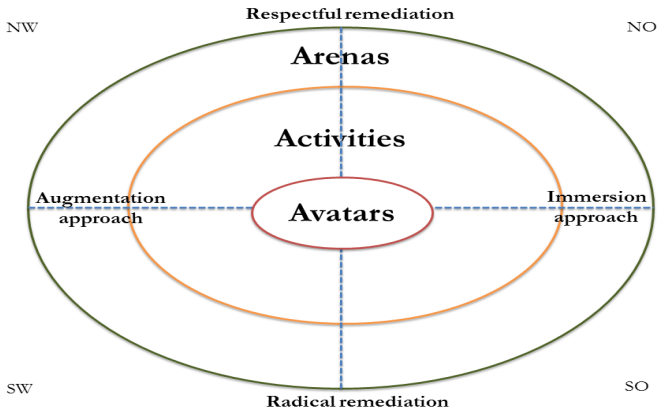

Figure 6.20. A design model for 3D-mediated pedagogical practice.

In terms of avatars, my data have shown that the participants in the study designed their avatars in four distinct ways: as real-life resembling humans, as non-humans, as sentient objects, and as pseudo humans. Figure 6.21. illustrates how such avatars could look. In terms of activities, my data have shown that a blend of different types is recommendable, and I imagine that activities also could be designed along the dimensions in the model. In relation to the different activities I designed in the research cycles, I was conscious about shifting between especially respectful and radical activities. In the beginning of the courses, I usually designed activities that were familiar to the students, and as the course progressed I asked them to engage in more radical activities (e.g. flying). As we saw in the MIL09 cycle, my co-facilitator, Mew, experimented with the augmentation-immersion approach. In terms of arenas, my data are limited by insofar as the 3D space is one aspect of the world that I have not studied in detail (which is a limitation of the study that I will return to in the conclusion). My data do, nonetheless, suggest that a blend between different arenas – both for communal and individual use – would be recommendable. Furthermore, the three concept maps proposed in chapter three could be used for content inspiration.

Regardless that this design model has been created based on my findings, further studies are needed in order to determine its practical value.

Figure 6.21. Four types of avatars.

In conclusion, with regards to design in SL, my data have shown that practice *is* a response to design, and in the words of Lázló Moholy-Nagy *to be a designer*:

> (...) means not only to sensibly manipulate techniques and analyze production processes, but also to accept the concomitant social obligations … Thus quality of design is dependent not alone on function, science, and technological processes, but also upon social consciousness. (Moholy-Nagy cited in Findelli. 1990, p. 19)

CHAPTER 7. CONCLUSION AND FUTURE RESEARCH

This study has been driven by a research interest in the avatar phenomenon and how 3D-remediation affects transformation of practice in a pedagogical community of practice. In this final chapter, I summarize the answers to the study's two main research questions, and highlight the study's contribution to knowledge. I reflect on the methodological foundations of the study, and point to limitations of the study. Finally, I identify issues of interest for future research.

7.1. RESPONSES TO DESIGN FOR LEARNING THROUGH AVATAR-MEDIATION

In this study, I aimed at answering two main research questions concerned with 1) how students in a pedagogical community of practice respond to avatar-mediation and transformation of practice, and 2) how design for learning can be conceptualized and implemented to facilitate meaningful participation and reification for students in the 3D virtual world, Second Life?

Throughout the dissertation, I have worked on answering these questions separately, and I have suggested answers in chapters five and six respectively. Nonetheless, the separation of my dual research interest has mainly served analytical purposes. As we have seen, in practice the avatar is very a powerful design element that influences all other design elements given that it is through the avatar the user of the virtual world experiences the rest of the design. In other words, it is through the avatar that the students in this study responded to the pedagogical design, and the central role of the avatar is reflected in the proposed framework for 3D-remediation of pedagogical practice. Summing up, the 3D-mediation influences the students' experiences and practices in SL in relation to three dominant aspects:

- **Meaning.** With the avatar as point of departure for their new 3D-remediated lives, the students were challenged in several ways, as they had to get accustomed to their representations' appearance and behaviour. Furthermore, participation and reification depended on the students' abilities to master their avatars. In terms of design this calls for focus on the avatar phenomenon, and especially allocated time to acclimatise to the virtual world. In this study activities closely related to the subject matter also contributed positively to the

students' meaningful experiences. Didactic Design Discussions and the students' own presentation inworld were among the most popular activities.

- **Identity.** Through the avatar, the students were forced to negotiate their presence inworld, and while there were positive aspects related to the avatar-mediation, the avatar in itself could also become a barrier to meaningful experiences inworld. In terms of design this also calls for focus on the avatar phenomenon and what it means for participants. In this study several activities were designed to focus on identity. Being a newcomer in this particular 3D-remediated community was addressed in Newbie Nights on a practical and technological level and to some extent in the Didactic Design Discussions, where theoretical aspects of identity such as presence and embodiment were discussed. Communal inworld groups and places were established to cultivate community and membership.
- **Learning.** Overall the 3D-remediation contributed to two distinct types of learning. First of all, the avatar gave rise to some very interesting discussions and reflections on professional identity and the general role of the teacher. Most students were forced to reflect on issues of identity, community, and legitimate peripheral participation. Another type of learning was connected to a more profound or grounded understanding of certain theoretical concepts connected to virtual worlds (e.g. immersion, presence, and embodiment), and in the later research cycles also pedagogical concepts, as the students had to reify their theoretical experiences in inworld presentations.

7.2. CONTRIBUTION TO EXISTING KNOWLEDGE

Based on the findings and the answers to the research questions, the outcome of this research consists of the creation of new knowledge about the avatar phenomenon and how this influences students' perceptions and practices when learning in a 3D virtual world. As identified in chapter two, there is a research gap concerning adult, professional learners' experiences with 3D virtual worlds, which this study has tried to mitigate.

The study has contributed with different types of design materials educators can use when designing for teaching and learning in 3D virtual worlds:

- A conceptual design model based on the communities of practice framework.
- A set of 12 design principles based on revised principles from the communities of practice framework, including five new principles targeted SL/3D virtual worlds.
- A design framework inspired by remediation theory and the study's empirical findings.

While the above-mentioned design materials have been created with adult, professional learners in mind, the analysis has revealed commonalities with other target groups in other settings, which raises the possibility of extending the findings to other areas of research.

Overall, the study has also provided some insight into the avatar phenomenon that could be of more general interest outside the educational field. As witnessed, the grounded theory approach revealed two dominant aspects of the avatar phenomenon, each perspective encompassing several sub-categories of the avatar appearance and the avatar behaviour. While other studies previously have confirmed the importance of the avatar, my data offer explanations as to *why* the avatar attracts so much attention. Therefor, the developed categories could be of interest in other types of designs for user-experiences in 3D virtual worlds.

In this study, I have been inspired by a grounded theory approach in terms of generating and analysing data, and even though the aim of the study has not been to validate existing theory, I would argue that the study still contributes with new aspects of the community of practice framework (e.g. the conceptual design model and the new design principles). As we saw in chapter two, research in SL based on situated learning and communities of practice continues to be sparse, but this research has confirmed the positive potential of applying such a framework to ensure meaningful teaching and learning in SL.

7.3. REFLECTIONS ON THE DESIGN OF THE STUDY

I chose to apply an overall research-led AR approach to design study. As I explained in chapter three, there are certain similarities between AR and DBR. Looking through this dissertation as it is presented here in a hopefully coherent and logic manner, I cannot help but notice the similarities my study shares with the DBR approach. I have previously stated that one of the main reasons I do not consider this a DBR study, has to do with the fact that I did not apply a predefined theoretical framework from the beginning of the study. Nonetheless, I did not enter this field and this study devoid of theoretical pre-understanding. The pedagogical background that permeates the MIL culture clearly has influenced my actions and reflections throughout the research cycles. Having said this, I do believe that this study could have been conducted as a DBR study and most likely have reached some of the same conclusions. At the same time, I wonder if the five new principles I created as a response to the empirical findings would have emerged, had I tried to apply the full communities of practice framework from the onset. In any case, I believe that my study has confirmed the similarities between the two approaches, in particular when the AR is research-led.

One of the most challenging aspects of this study has been my dual role as teacher and researcher. During the research cycles, I found it very difficult, and quite frankly oftentimes undesirable to leave the role of the teacher. My priority was always the

students' learning, and in hindsight this prevented me from gathering certain types of data. No doubt, my data would have benefited from interviews with students, but given the huge amount of time the students already spend in SL, I was reluctant to ask them. As it were, I have relied heavily on the students' written (and often retrospective) accounts of their experiences. To mitigate this, I have tried to combine and validate the students' postings with my own observations, but as stated earlier, my observations were mostly done after the inworld sessions.

Another challenge has been the use of the grounded theory approach. In the first two research cycles the grounded approach proved very fruitful, but hereafter I found that my imagination and openness to new phenomena decreased significantly. According to Hammersley & Atkinson (1995) this is quite normal, but I am wondering if this is a more fundamental problem when studying familiar cases, and especially designed cases such as education.

Given the design of the study and the above-mentioned challenges, there are some limitations that should be taken into consideration when interpreting the findings of this study. Although this study has relied on extensive qualitative data, only one particular course in one particular setting has been studied. The participants in the study are inherently positive and curious towards the use of emerging technologies in relation to teaching and learning processes due to their choice of study programme. Extending the findings to other groups of adult learners should therefore be cautioned. The MIL programme represents a distinct culture prone to certain ideas, which may be perceived as a bias in terms of determining whether the social theory of learning and the communities of practice is a suitable theoretical framework for design in 3D virtual worlds. Therefore, more research focusing on a variety of pedagogical designs and settings is needed to study whether the results found are typical only for the examined field or whether they are also generalizable to other adult learner contexts.

The sample size is also relatively small and varied in the four research cycles between 22 and eight students. The most successful research cycles were those with fewer students, and while this also has to do with better design, the number of students cannot be ignored. The study has shown that personal technological stewarding is crucial to the students' overall perception and satisfaction with a 3D virtual world as a learning environment. The participation of a co-facilitator (MIL09/MIL10) proved very fruitful, but one has to wonder whether this is a sustainable strategy in most educational settings where resources often are limited. This again points to the role of the teacher as researcher. As mentioned in chapter three there is an uneven power balance between a teacher and her students, and this could influence the results in a negative way. Additionally, because this was my research project, I was able and willing to spend a lot of time in this study to try to create the best possible conditions for the students. As researcher my interest in the pedagogical design was undoubtedly more profound than I usually experience as a teacher. As we witnessed in chapter five, the students often commented on my engagement in the courses, and even though the students'

comments were positive this may also be perceived as a bias. In any pedagogical design it is difficult to ascertain which part of the design the participants respond to, but inter-personal relations between the teacher and her students should not be underestimated. Therefore, I would also caution against generalization of this study's findings in this regard. More research on optimal group or cohort size and the time to prepare, implement, and evaluate pedagogical designs in 3D virtual worlds is needed.

7.4. FUTURE RESEARCH

Based on the findings in this study, I have found it difficult to conclude anything significant in terms of the teaching and learning potential of the 3D space. This is quite ironic given that the space is a defining characteristic of 3D virtual worlds. As we saw in relation to the proposed framework, I have to some degree focused on the 3D space in terms of designing different types of remediated teaching and learning arenas. In my study, I did not have a designated MIL island, but was forced to use different places in the research cycles, making it hard to plan place-bound research activities in a systematic way. Despite my hesitancy to conclude anything substantial in terms of 3D space, my data has revealed a couple of interesting issues that could guide future research and also contribute to further understanding of the use of the communities of practice framework in 3D virtual worlds:

- Study the 3D space-place duality
- Further study of the resident-user duality
- Further study of the materialized-verbalized reification duality

In the winter of 2011/2012, I taught yet another MIL course in SL that I have chosen not to include in this study due to data saturation in relation to the research questions. While this course was not part of my research, it is difficult, and I would say undesirable, to separate the teacher and the researcher. As seen from a research perspective, one of the most interesting aspects of the MIL11 course was the use of designated student spaces/sandboxes from the onset of the course. The MIL11 students worked in small teams and as part of their course assignment they were asked to build teaching and learning environments from scratch as seen in figures 7.1. and 7.2. below (Riis, 2012, January 22nd). It would be interesting to study the data collected in that course, as I speculate that the data could provide some interesting answers to the proposed issues above.

Figure 7.1. Team C's sandbox early in the MIL11 course.

Figure 7.2. Team C's sandbox ready for their presentation.

7.5. CLOSING REMARKS

In 2009, Wenger, White & Smith stated:

> We have hardly started to explore the potential of avatar-based virtual environments such as Second Life. Seeing others' avatars, even if we do not interact with them, lets us know we are not alone. No one knows where this trend will lead, but it is clear that it has the potential to transform the way we interact, and more generally, the way we experience togetherness. (Wenger, White & Smith, 2009, p. 175)

This dissertation is my contribution to understanding the phenomenon of avatars and their influence in relation to teaching and learning in Second Life.

At the same time, I respectfully acknowledge the explanation of the essence of reality and togetherness, as it was presented back in 1922, as one of the best I have come across as yet:

> "What is REAL?" asked the Rabbit one day, when they were lying side by side near the nursery fender, before Nana came to tidy the room. "Does it mean having things that buzz inside you and a stick-out handle?"
>
> "Real isn't how you are made," said the Skin Horse. "It's a thing that happens to you. When a child loves you for a long, long time, not just to play with, but REALLY loves you, then you become Real."
>
> "Does it hurt?" asked the Rabbit.
>
> "Sometimes," said the Skin Horse, for he was always truthful. "When you are Real you don't mind being hurt."
>
> "Does it happen all at once, like being wound up," he asked, "or bit by bit?"
>
> "It doesn't happen all at once," said the Skin Horse. "You become. It takes a long time. That's why it doesn't happen to people who break easily, or have sharp edges, or who have to be carefully kept. Generally, by the time you are Real, most of you hair has been loved off, and your eyes drop out and you get loose in the joints and very shabby. But these things don't matter at all, because once you are Real you can't be ugly, except to people who don't understand." (Williams, 1922, pp. 5-8 - original emphasis)

CHAPTER 8. REFERENCES

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Overview of my own blogposts cited in the dissertation.

Year, date	Title and link
Riis, 2012, June 7th	MUVEs for learning https://mariis.net/2012/06/07/muves-for-learning/
Riis, 2012, May 20th	Alice and Dorothy play together - but what about Wendy? https://mariis.net/2012/05/20/alice-and-dorothy-play-together-but-what-about-wendy/
Riis, 2012, May 6th	It's not a game ... https://mariis.net/2012/05/06/its-not-a-game/
Riis, 2012, January 22nd	SL, History lessons in High School - and huge technical problems https://mariis.net/2012/01/22/sl-history-lessons-in-high-school-and-huge-technical-problems/
Riis, 2011, September 16th	Student perceptions of Presence in a Virtual World https://mariis.net/2011/09/16/student-perceptions-of-presence-in-a-virtual-world/
Riis, 2011, September 13th	Inworld kick-off session with technical challenges https://mariis.net/2011/09/13/in-world-kick-off-session-with-technical-challenges/
Riis, 2011, August 23rd	Upcoming PD-course in SL for teachers at Universidad Nacional, Heredia, Costa Rica https://mariis.net/2011/08/23/upcoming-pd-course-in-sl-for-teachers-at-universidad-nacional-heredia-costa-rica/
Riis, 2011, July 2nd	High student satisfaction in SL https://mariis.net/2011/07/02/high-student-satisfaction-in-sl/
Riis, 2011, February 7th	Different aspects of being there together https://mariis.net/2011/02/07/different-aspects-of-being-there-together/

Riis, 2011, February 1st	Perceived properties of SL in relation to ADHD-patients https://mariis.net/2011/02/01/perceived-properties-of-sl-in-relation-to-adhd-patients/
Riis, 2011, January 24th	Connecting theory and practice through SL designed case-based simulations https://mariis.net/2011/01/24/connecting-theory-and-practice-through-sl-designed-case-based-simulations/
Riis, 2011, January 20th	Thinking out-of-the-box ... from inside the box! https://mariis.net/2011/01/20/thinking-out-of-the-box-from-inside-the-box/
Riis, 2011, January 14th	Cooperative learning in SL https://mariis.net/2011/01/14/cooperative-learning-in-sl/
Riis, 2010, March 17th	Google docs and EtherPad in SL Viewer 2 https://mariis.net/2010/03/17/google-docs-and-etherpad-in-sl-viewer-2/
Riis, 2010, January 3rd	Case MIL: preliminary thoughts based on 3 research cycles https://mariis.net/2010/01/03/case-mil-preliminary-thoughts-based-on-3-research-cycles/
Riis, 2009, December 29th	Case MIL09: Students analysis of SL - part 4 https://mariis.net/2009/12/29/case-mil09-student-analysis-of-sl-part-4/
Riis, 2009, December 27th	Case MIL09: Students analysis of SL - part 3 https://mariis.net/2009/12/27/case-mil09-student-analysis-of-sl-part-3/
Riis, 2009, December 27th	Case MIL09: Students analysis of SL - part 2 https://mariis.net/2009/12/27/case-mil09-student-analysis-of-sl-part-2/
Riis, 2009, December 26th	Case MIL09: Students analysis of SL - part 1 https://mariis.net/2009/12/26/case-mil09-student-analysis-of-sl-part-1/
Riis, 2009, October 4th	PBBL course evaluation - preliminary thoughts https://mariis.net/2009/10/04/pbbl-course-evaluation-preliminary-thoughts/

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Riis, 2009, March 3rd — SLoodle hands-on workshop https://mariis.net/2009/03/03/sloodle-hands-on-workshop/

Riis, 2008, November 18th — Challenges of flexibility and facilitation https://mariis.net/2008/11/18/challenges-of-flexibility-and-facilitation/

SUMMARY

The purpose of this study is to understand and conceptualize the transformation of a particular community of pedagogical practice based on the implementation of the 3D virtual world, Second Life™. The community setting is a course at the Master's programme on ICT and Learning (MIL), Aalborg University. The study is guided by two research questions focusing on the participants' responses to the avatar phenomenon and the design of the course.

A research-led Action Research approach has been chosen to enable research with focus on both actions and critical reflections carried out in four consecutive research cycles. 53 master students, one main teacher, and several guest teachers have participated in the study. The findings are predominantly based on analysis of asynchronous student discussions in FirstClass™ and synchronous participant observation in Second Life.

The study contributes with knowledge about 3D Virtual Worlds, the influence of the avatar phenomenon and the consequences of 3D-remediation in relation to teaching and learning in online education. Based on the findings, a conceptual design model, a set of design principles, and a design framework has been developed.

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