A RESEARCH FOCUSED
ON POSSIBLE APPLICATIONS OF SECOND
LIFE FOR THE UNIVERSITY MEDICAL
CENTER GRONINGEN

- ADVISORY INVESTIGATIVE REPORT -

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EXECUTIVE SUMMARY

The University Center Groningen is the largest institute for medical training in the Netherlands. This does not only entail medical education at a university level and the training of medical specialists, it offers education at all other levels as well. UMCG has followed a policy of internationalization for the past few years and one of the main goals of UMCG as institution is to enter the top 50 world ranking in research universities. UMCG is also an innovative organization interested in developing new technological training tools and facilities for the medical specialists. A recent example in training and education is the construction of the Skills&Medical Centre by the Wenckebach Institute. In this state-of-the-art training facility, healthcare professionals can learn and develop their skills in a simulated care and treatment environment.

One of the immersive technologies in the last few years is the internet- based virtual world Second Life. This is a 3-D Web environment which enables its users to interact with each other, providing an advanced level of a social network service. Residents can explore, meet other residents, socialize, participate in individual and group activities, create and trade items and services from one another. More and more international companies and organizations are entering Second Life and offering their products and services there just as in the real world.
There are also universities and health care institutions present in Second Life offering online simulated training and education for students and professionals. Visitors and potential students can have an impression of what a given university or college is like, what are the main activities and courses, etc. The Board of Directors of UMCG became interested in Second Life and are eager to discover what the possibilities for the organization are. Therefore the Communication Department received an assignment to research if UMCG can benefit from its existence in Second Life and how.

After meetings with the project team, it was determined that the main aim of the research is to ascertain if Second Life can be used as recruitment tool for international PhDs, Master students and doctors. Additional aim is to provide general overview of other activities that UMCG can perform in Second Life, especially if the results from the research lead to negative advice regarding the possibilities for attracting more international PhDs, Master students and doctors.

It is to be mentioned that the Central Medical Library in UMCG together with the Communication Department has rented an island in Second Life. The purpose of this island is to offer interested parties the possibility to experiment with different activities. The island was open for public few weeks ago.

For the present project, qualitative field research was conducted in order to gather primary information. Applying qualitative research approach involved conducting semi-structured interviews and key informative interviews, and participating in meetings and presentations. A total of fourteen semi-structured interviews were conducted with international PhDs, Master

students and Post-doctors. These interviews assisted in answering two of them main research questions:

- *What are the steps that a potential Master and PhD students undertake when looking for a program and university?*
- *How do Master and PhD students perceive social network services and Second Life?*

A total of four key informative interviews were conducted with key persons from UMCG involved in the recruitment process of international doctors, Master students and PhDs as well with people from the Wenckebach Institute involved in e-learning and simulations. Furthermore the researcher, together with the project team members, participated in meetings with individuals from UMCG who might be interested in Second Life and its applications in health and medicine. During these meetings different aspects of Second Life were shown to the participants followed by discussions about different possibilities in using it.

Desk research and literature review have been conducted to collect secondary information about Second Life in general (statistics, previous research on Second life, educational possibilities), universities and big health institutions in Second Life and their activities, behavior models and communication theories accessible from previous research studies.

The interviews with international PhDs, Master students and Post-doctors revealed that these have high demand on specific information regarding their future programs and positions. They need detailed information about the projects and activities they will be involved in and the most preferable and trustworthy way to obtain this information is through personal contact. The target groups consider social software useful to some extent but unreliable source of information. The majority of the interviewees do not use any social network services other than email and instant messaging. Furthermore it was discovered that in some countries having computer and internet is not taken for granted and some prospective students may not have the technical support to access Second Life.

Desk research was unable to detect any visible practices in recruiting students through Second Life.

The interview with representative from the International Office in UMCG revealed that the office is lacking personnel and will have difficulties in supporting new incoming students in general, but also through Second Life.

Based on the research results and their analysis it is not recommended that UMCG use Second Life as recruitment tool. Taking all the above points into consideration, it would be rather irrational and risky to start using Second Life for recruiting international PhD, Master students and Post-doctors. Whereas the problem with the lacking personnel can be eliminated by employing more people, it would be almost impossible to change the attitudes of the targets towards social software and Second Life. Furthermore, the lack of computers and available internet in some countries are beyond the control of the organization and the individuals.

One of the most significant findings of the research is the fact that the Wenckebach Institute is definitely interested in trying the different possibilities Second Life offers for health education and training. The Wenckebach Institute is responsible for the further education of all professionals in the field of medicine and nursing in the whole UMCG. The new skill lab, the e-learning environment and the recently developed online simulation game, demonstrate that the institute is open towards innovations and technology in the education.

Desk research revealed that more and more universities and other educational institutions are discovering the possibilities that Second Life offer for education and training. The virtual world provides a flexible environment for educators interested in distance learning, simulation, computer-supported cooperative work, and corporate training. The digital innovations allow different and new types of interactions that provide better educational experiences for students. There are more than 150 educational institutions in Second Life that provide among other things online education and training. Some of the most successful practises are in the field of health care and medicine.

The visibility of positive results in the field of health simulations and medical education in Second Life, and the experience with innovation of Wenckebach Institute are premises to recommend the implementation of the virtual world for education and training. However there are some points which should be taken into consideration. A large implementation of Second Life will require high processing speed, high speed internet connection and non-integrated video cards. This will cost high amount of money if implementation is done at once. Therefore it is recommended that deployment is done step by step, beginning by offering the possibility first to student and faculty volunteers who are interested in Second Life and already posses the necessary technology. Based on the research results, the Wenckebach Institute could be considered a volunteer for experimenting with Second Life.

Moreover the International Summer Schools are also seriously thinking about participating in Second Life.

Further research is required in order to determine which other departments within UMCG may have interest in experimenting with the virtual environment. Such research should include survey among teaching staff and students in order to make these parties familiar with Second Life and generate their opinion as to what implications it can have for the study curriculum.

One of the activities which UMCG can perform in Second Life is establishing patients' support groups. The meetings with representatives from the lever transplant department and the Multiple Sclerosis Society Netherlands- Groningen revealed an interest from the parties in developing concepts for patients' support groups. The fact that these came back with request for another meetings to be held in mid March and May, demonstrates that they see possibilities in using Second Life within their departments. Nevertheless, further research is required in order to discover what the patients think about Second Life and to generate ideas how the virtual world can be best used for their needs and wishes.

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CHAPTER 1: INTRODUCTION

1.1 Background

The University Medical Centre Groningen is the only University Medical Centre in the northern part of the Netherlands and therefore the final point of referral for many patients. Furthermore UMCG is a center for education and research. It annually educates hundreds of medical professionals such as doctors and nurses. In addition UMCG carries out hundreds of scientific studies each year. The UMCG's strength is in the close integration of its core activities: patient care, education and research. Perfection in these three areas is what UMCG wants to achieve now and in the future.

The UMCG is the largest institute for medical training in the Netherlands. This does not only entail medical education at a university level and the training of medical specialists, it offers education at all other levels as well. Doctors can further specialize at the UMCG as it houses all medical specialties. Education for nurses and paramedical professionals is also available.
UMCG has followed a policy of internationalization for the past few years. One of the main goals of UMCG as institution is to enter the top 50 world ranking in research universities. In order to achieve this, recruiting top researchers and students from all over the world is required. UMCG is also an innovative organization and follows the trends in technology and education. The development of new technological training tools and facilities, including an electronic learning environment illustrate the innovativeness of the institution. There are also multimedia and simulation facilities that students and professionals can use. As a result, the training takes less time and is more effective. A recent example in training and education is the construction of the Skills&Medical Centre by the Wenckebach Institute. In this state-of-the-art training facility, healthcare professionals can learn and develop their skills in a simulated care and treatment environment.

One of the emerging technologies in the last few years is the internet- based virtual world Second Life. This is a 3-D Web environment which enables its users to interact with each other, providing an advanced level of a social network service. Residents can explore, meet other residents, socialize, participate in individual and group activities, create and trade items and services from one another. More and more international companies and organizations are entering Second Life and offering their products and services there just as in the real world.
There are also universities and health care institutions present in Second Life offering online simulated training and education for students and professionals. Visitors and potential students can have an impression of what a given university or college is like, what are the main activities and courses, etc. The Board of Directors of UMCG became interested in Second Life and are eager to discover what the possibilities for the organization are. Therefore the Communication Department received an assignment to research if UMCG can benefit from its existence in Second Life and how.

1.2 The assignment

After meetings with the project team, it was determined that the main aim of the research is to ascertain if Second Life can be used as recruitment tool for international PhDs, Master students and doctors[1]. Furthermore, what can Second Life offer to support the communication tools that UMCG already uses for reaching its targets? An additional aim is to provide general overview of other activities that UMCG can perform in Second Life, especially if the results from the research lead to negative advice regarding the possibilities for attracting more international PhDs, Master students and doctors.

1.3 Research questions

There are five research questions that need to be answered throughout this study. The first two questions are related to the investigation of existing practices of universities and health institutions in Second Life. The third question is aiming at revealing the means through which international doctors are targeted. The fourth question aims to discover the attitudes of international PhDs and Master students towards social software and Second Life. And the objective of the last question is to reveal the information gathering process of the international PhDs and Master students with regard to future programs and positions.

- Which University Hospitals and other large health institutions are already in Second Life and what activities they perform there?
- Are there any universities in Second Life that promote themselves there and if so are they successful?
- How is the recruitment process of international doctors organized within UMCG?
- How do Master and PhD students perceive social network services and Second Life?
- What are the steps that a potential Master and PhD student undertakes when looking for study and university?

1.4 Short organization of the report

In the first chapter the background and the assignment are presented. The second chapter talks about concepts and conclusions of previous studies and theories. In addition, the most important results of desk research on Second Life are also presented. Chapter three focuses on the study of the organization UMCG. The research methodology is presented in chapter four followed by the results in chapter five. A detailed discussion of the results can be found in chapter six and the recommendations that are derived from this discussion are to be found in chapter seven. Finally, the conclusions of this paper are presented in chapter eight.

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[1] The initial aim was to investigate if Second Life can be used also for recruiting German medical doctors. However during the first phase of the research process it became clear that the Human Resources Department is absolutely against the use of Second Life at this moment..More information can be found in the Chapter four. Nevertheless the researcher made efforts to set up interviews with some German anaesthesiologists. However they did not respond to the invitations. Therefore there are no results in this paper regarding the recruitment of international medical doctors through Second Life.

CHAPTER TWO: LITERATURE REVIEW

In order to conduct the study on this specific topic the following theories and conclusions of previous studies were used as guidance through the research. The theories used are related to concepts and conclusions of previous studies in the field of virtual worlds and online education. Additionally, communication theories and behavior models were used to explain the implications of communication on this study. Furthermore the most important results of desk research on Second Life are presented as well.

2.1 What is Second Life

Second Life is an internet-based virtual world, developed by Linden Lab and launched in 2003, which came to international attention via mainstream news media in late 2006 and early 2007. The 3-D web environment enables its users to interact with each other, providing an advanced social network service. Residents can explore, meet other residents, socialize, participate in individual and group activities, create and trade items and services from one another.

The Second Life Grid provides the platform where Second Life resides and offers the tools for business, educators, nonprofits, and entrepreneurs to develop a virtual presence.

Second Life's virtual currency is the Linden Dollar and is exchangeable for real world currencies in a resident to resident marketplace facilitated by Linden Lab. There is no fee for registering an account or participating in Second Life, however registration of "payment information" is mandatory in order to participate in some functions, such as owning land or islands, as well as to access certain support features such as Second Life's support portal and online forums.

More than 12 million accounts have been registered, although many are inactive, some residents have multiple accounts, and there are no reliable figures for actual long term consistent usage. It is estimated that only at about 1.1 million accounts are currently active. (Wikipedia, 2007)

Statistics about Second Life can be found in Appendix 1

2.2 Education in Virtual Worlds and Second Life

Educational institutions are increasingly exploring the possibilities of 3-D virtual worlds for instruction and research, but few studies have been done to record current practices and uses of this popular technology. A big part of the research consists of desk research and respectively great amount of results were obtained through this research technique. In order to provide a good advice and recommendations concerning the usage of Second Life, a comprehensive literature survey for obtaining enough and valuable information about virtual worlds and education and Second Life in particular is essential.

To begin, it is important to clarify what virtual worlds are. A virtual world has been identified by Boulos (2007) as a computer-based, simulated multi-environment, usually running over the

web, and designed so that users can "inhabit" and interact via their own graphical self representations known as avatars. Three-dimensional (3-D) virtual worlds like Second Life can be considered 3-D social networks, where people can collaboratively create and edit objects in the virtual world (like a collaborative 3-D wiki space), besides meeting each other and interacting with existing objects.

Users of virtual worlds design their environments and often their avatars as well and control how these communicate, move, create things and interact. Nowadays virtual worlds are immersive, animated 3D environments that operate over the Internet, giving access to anyone in the world. Although many online games take place in such environments, the concept of a virtual world does not require the elements of a game, such as rules or an explicit objective. Residents of a virtual world have the freedom to do and be nearly anything they want, limited only by the design of the environment.

Virtual worlds like Second Life employ many of the features of Web 2.0, such as group instant messaging, voice chat, profiles and real-time social networking and an unique form of online social interaction that involves sharing various objects and creative collaboration on building and running places and services in the virtual world (user-generated content).

Compared with the conventional 2-D web, virtual worlds offer novel, intuitive ways to:

- Navigate multi-media content (streaming audio/video/TV collections—for example, Second Life SONY BMG Music Entertainment on Media Island);
- Browse information spaces/document collections in 3-D virtual libraries (for example, Second Life Medical and Consumer Health Libraries in Healthinfo Island)
- Relax, visit new places, and sample new cultures (virtual tourism, e.g. visit Virtual Morocco in Second Life or Egypt's pyramids and Sphinx in There.com);
- Play multi-player games in the virtual world, including educational, health related games;
- Buy, sell and advertise virtual and real-life goods and services—many real-world, famous brand names have already established a presence in Second Life;
- Develop social skills (and even clinical skills, for example, Second Life Heart Murmur Sim,)/socialize and interact with other people via customisable, realistic, 3-D, fully textured and animated avatars (3-D social networking);
- Attend and participate in live events like Second Life lectures, conferences, festivals, and concerts; and build communities, including learners' communities and patient support groups, among many other things. (Boulos et al.2007)

For more information about Web 2.0 and virtual worlds, please refer to Appendix 2

The digital innovations that have emerged over the last few years are leading to incorporation of social media technologies in teaching and learning. Virtual worlds allow different and new types of interactions that provide better educational experiences for students. Computer gaming is an increasingly common activity among young students, and exploring the educational potential for virtual worlds give institutions an opportunity to incorporate a medium that students enjoy into learning.

The New London Group coined the term '*multiliteracies*' to address the multiplicity of communications channels and increasing cultural and linguistic diversity in the world today for students and users of technology through creating access to the evolving language of work, power, and community, and fostering the critical engagement necessary for them to design their social futures and achieve success through fulfilling employment. From an educational standpoint, the concept of multiliteracies refers to how people must adapt to the changing nature of communication in a digital age and to what must be inculcated in students in order for them to succeed in lives where productivity depends on keeping up with technology. (Stevens, 2006)

A very interesting concept of modern, high-tech learning is the "Distributed Learning Networks" coined by Stephen Downes. Downes (as cited in Wise 2006) discusses Learning Networks, whereby instead of educators providing a service to people directly, they will be providing a service to enable people to provide that service to themselves. Education is not about the content; instead content is the medium of communication. In Web 2.0, learning takes place not in institutions, but in social networks and communities created by and for the learners themselves, eg Yahoo groups, MySpace, forums, special interest community groups, etc.

Traditional institution-based online learning is product-based, based around "learning content", learning objects and resources. Furthermore the emphasis is on course content. Students engaged in educational games and simulations are not passive. They are interpreting, analyzing, discovering, evaluating, acting and problem solving. This approach to learning is much more consistent with constructivist learning, where knowledge is constructed by the learners as they are actively problem solving, than with traditional instruction.

Comparison of Constructivist and Traditional Learning

	Constructivist	**Traditional**
Knowledge	Constructed, emergent, situated in action or experience, distributed	Transmitted, external to knower, objective, stable, fixed, decontextualized
Reality	Product of mind	External to the knower
Meaning	Reflects perceptions and understanding of experiences	Reflects external world
Symbols	Tools for constructing reality	Represents world
Learning	Knowledge construction, interpreting world, constructing meaning, ill-structured, authentic-experiential, articulation-refection, process-oriented	Knowledge transmission, reflecting what teacher knows, well-structured, abstract-symbolic, encoding-retention-retrieval, product-oriented
Instruction	Reflecting multiple perspectives, increasing complexity, diversity,	Simplify knowledge, abstract rules, basics first, top-down,

	bottom-up, inductive, apprenticeship, modeling, coaching, exploration, learner-generated	deductive, application of symbols (rules, principles), lecturing, tutoring, instructor derived and controlled, individual, competitive

Source: Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999). *Learning with Technology: A Constructivist Perspective.*

In their article "Next generation learning systems and the role of teachers", The Learning Federation suggests that by the year 2020, new learning systems will enable teachers to create challenging assignments that can close the gap between the world of instruction and the world of work and tailor instruction to increase the efficiency of learning. Furthermore next generation learning systems will allow learners to access live and recorded lectures from multiple sources. Performance-based assignments will allow learners and small groups to demonstrate levels of expertise in tasks where they are strongly motivated to succeed.

A very important notice made in this article is that the new learning systems will require dramatic changes in the organizational structures and management systems of the institutions that deliver education. The latter must improve the way they invest in innovation, manage innovation, invest in capital equipment and assign responsibilities to different occupations. (U.S. Department of Commerce, 2007)

2.3 Behavior Models and Theories and Their Applicability in the Research

These models and theories are very important for the research mainly for two reasons. On one hand it can help the organization to determine to which group of innovators it belongs and from there can assist in the decision whether to use Second Life or not. On the other hand it can assist in predicting how the potential users of Second Life may react to the introduction of this technology. As they are eventually the ones to use the innovation, it is important to see why they will react in the way they will. Furthermore the models are of great importance for the analysis of the interviews conducted during the research.

One of the most important theories that has potential application to information technology and has been used as theoretical basis for a number of IS research projects is the Diffusion of Innovation Theory, developed by Everett Rogers. The theory explains how innovations occur in an individual and society.

Before looking into the concept of the theory it is essential to clarify what diffusion means. Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion is a special type of communication concerned with the spread of messages that are perceived as new ideas. The four main elements in the diffusion of new ideas are: the innovation, communication channels, time, and the social system. (Rogers, 1995)

Rogers (1995) suggests that the rate of adoption of innovations is impacted by five factors:

- **relative advantage** (the degree to which it is perceived to be better than what it supersedes)
- **compatibility** (consistency with existing values, past experiences and needs)
- **complexity** (difficulty of understanding and use)
- **trialability** (the degree to which it can be experimented with on a limited basis)
- **observability** (the visibility of its results)

From the above it can be concluded that innovations that are perceived by individuals as having bigger relative advantage, higher compatibility, observabiliy and lower degree of complexity, will be adopted more rapidly than other innovations. The above characteristics of an innovation, as perceived by members of a given social system, determine its rate of adoption.

Rogers (1995) distinguishes five adopter categories depending upon how quickly individuals adopt new ideas and behaviour. These are: innovators (2.5% of the population), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%).

Whereas the diffusion process happens within society, the adoption process happens to an individual and occurs in five stages: awareness, interest, evaluation, trial and adoption. The innovation-decision process for individuals also occurs in five stages: knowledge about the innovation, attitude about the innovation, decision to adopt or reject the innovation, implementation of the innovation and confirmation of this decision (Rogers, 1995).

2.4 Communication Theories and their Applicability in the Research

A concept that has been adapted for the purpose of this research and used during the interviews with international PhDs and Master students is the Sense-Making Approach developed by Brenda Dervin (1989). It helped answering one of the research questions, namely *"What are the steps that a potential international PhD and Master student undertakes when looking for study and university?"*.

The term *sense-making* is used both to designate the approach (called the sense-making approach) and the focus of the approach (how people make sense of their worlds). Sense-making as an approach is primarily a methodology, providing a conceptual framework within which to specify what aspects of situations ought to be attended to and how. Sense-making attempts to provide a systematic approach to listening to the audience- how they see their situations, past, present, and future- and how they move to construct sense and make meaning of these situations. (Dervin, 1989, p. 77)

Dervin (1989) suggests that the essence of the sense-making is the idea of the gap and how people define and bridge gaps in their lives. A gap is a problem people encounter at some point in their life and constructing a bridge means to solving this problem. By bridging the gap individuals gather information, create ideas and obtain resources which help them bridging the gap.

In all sense-making methods, the listener (i.e., the researcher) is mandated to listen to the respondent tell of how he or she moved through time-space. The core method of sense-making is the timeline-interview. The researcher asks the respondent to recollect what happened in a situation as a series of steps- what happened first, second, and so on. Finally for each step in the timeline, the researcher explores with the respondent how the respondent saw and defined the situation, its gaps, the means to bridge these, and so on. (Dervin, 1989, p. 77-78-79)

As mentioned above, during the research the sense-making approach was adapted to the purpose of the research and used during the interviews with international PhDs and Master students.
The gap in this case is the students facing a situation of where to continue their study and what program to choose. The gap-bridging is all the steps they make trying to manage the situation, including gathering information, obtaining ideas and sources and making a final decision. Last but not least, interviewees are asked to evaluate the situation as it is now.

Especially relevant for this research is how and where students look for information and what determines their decision as to where to continue their study. This matter is further discussed in the Methodology and Results chapters.

2.5 Educational Institutions in Second Life

More and more universities and other educational institutions are discovering the possibilities that Second Life offers for education and training.
Second Life provides a unique and flexible environment for educators interested in distance learning, computer-supported cooperative work, simulation, new media studies, and corporate training. Second Life provides an opportunity to use simulation in a safe environment to enhance experiential learning, allowing individuals to practice skills, try new ideas, and learn from their mistakes. Students and educators can work together in Second Life from anywhere in the world as part of a globally networked virtual classroom environment. (Second Life Education Wiki, 2007)

There are different numbers of educational institutions in Second Life to be found in different sources and therefore it is very hard to point out an accurate number. In an interview for the German magazine *Spiegel* from 31 January 2008, Philip Rosedale (founder of Second Life) states that there are 400 universities in Second Life and more than 4,000 teachers are on the Second Life education mailing list. (Stöcker, 2008)

A recent research on educational institutions in Second Life provides the information that as of May 2007, 170 educational institutions were identified, including accredited colleges, universities, and schools. An important note was made, that to determine whether or not an institution had a qualified presence in Second Life, institutions must have occupied a virtual location in Second Life or maintained a "group" in Second Life.

Overall of the 170 institutions examined, 120 institutions (70.6%) had a group in Second Life, and 71 institutions (41.8%) occupied land in Second Life. The majority of the institutions(68.8%, n-117) were physically located in North America in real life, (112 in the United States, and 5 in Canada), followed by Northern Europe (18.2%) including 26 in the united Kingdom, 2 in Denmark, 2 in Finland, and 1 in Ireland. (Collins C., Jennings N., 2008)

According to the Second Life Education Wiki (2007), there are more than 150 education institutions in Second Life, including universities, colleges, schools, profit and non-profit organizations listed on the quasi-official list of educational institutions who claim to a presence in Second Life, hosted on the SimTeach.com wiki. Some of the universities among others include Columbia University (USA), Edinburgh University(UK), Heinrich-Heine University(Germany), Harvard University (USA), University of Frankfurt(Germany), Ohio State University(USA), VU Amsterdam(The Netherlands) and many more.

A full list with educational institutions in Second Life can be found at Second Life Education Wiki- www.simteach.com

2.6 Health Education and health related activities in Second Life

Below are examples of some of the best health (educational) practices in Second Life:

- *New Media Consortium*

The New Media Consortium (NMC) Campus is the largest educational presence in Second Life and supports events, classes, demonstrations, art exhibitions and learning experiences.

Additionally, the NMC have hosted a number of real life conference session and associated events in Second Life, using streaming technologies to broadcast real life proceedings in-world.

NMC Virtual Worlds is a program of the New Media Consortium, an international not-for-profit consortium of more than 225 world-class colleges, universities, and research centers. The mission of NMC Virtual Worlds is to help learning-focused organizations to explore the potential of virtual spaces in a manner that builds on community knowledge, is cost-effective, and ensures high quality. NMC Virtual Worlds provides a palette of premium custom services for education and training, and conducts an ongoing series of events, conferences, and programs. (Virtual Worlds, NMC, 2007).

- *The Heart Murmur Sim*

The Heart Murmur Simulation by Jeremy Kemp was built as a proof of concept experiment that provides a cardiac training space where participants visit sick patients, listen to their heart rhythms and make a diagnosis.

- *UC Davis' Virtual Hallucinations*

The UC Davis Virtual Hallucinations facility in Second Life is designed to give visitors a better understanding of schizophrenia by simulating the experience of the visual and aural hallucinations associated with schizophrenia based on interviews with real schizophrenics. It can be used to train medical and nursing students and hospital staff.

- *Play2Train - Idaho Bioterrorism Awareness and Preparedness Program*

Play2Train is the Second Life component of the Idaho Bioterrorism Awareness and Preparedness Program designed to train emergency personnel for emergency preparedness. The virtual environment is a disaster simulator spreads over two islands, with one island dedicated to a virtual town and the other a virtual hospital. It comes complete with hospitals, helicopters, fire trucks and restaurants which can blow up at a moment's notice.

- *Second Health*

Working in conjunction with the UK's National Physical Laboratory (NPL), Imperial College London (ICL) has created a virtual hospital in Second Life and a series of documentary films that describe what healthcare of the future could look like. Visitors can explore the three-dimension clinic and watch multimedia presentations demonstrating the activities of specific departments.

The idea is to make people understand what a polyclinic is without making them having to read a 300-page document.

The creators of the Second Health see potential training applications as well. They expect to be able to train medical and GPs in the virtual environment of Second Life.

- *Healthinfo Island*

HealthInfo Island is entirely funded by a $US40 000 grant from the US National Library of Medicine (NLM)/Greater Midwest Region of the National Network to provide consumer health information services in Second Life. The NLM-funded project is officially entitled 'Providing Consumer Health Outreach and Library Programs to Virtual World Residents in Second Life' (2006–2008). Project partners include the Alliance Library System (ALS), the University of Illinois Library of the Health Sciences-Peoria, the Central Medical Library, the University Medical Center Groningen (UMCG) in the Netherlands, and TAP Information Services. (Boulos et al.2007)

The project is dedicated to health information in various forms. It aims at providing training programs, outreach to virtual medical communities, important consumer health resources, and one-on-one support to Second Life residents. The target populations for HealthInfo Island include Second Life residents participating in identified in-world medical groups (e.g. groups

dealing with stroke support, cerebral palsy, mental health and autism), or interested in learning more about health and wellness, in addition to outside groups/professionals who might be interested in Second Life as a platform for providing services and outreach for health services. (Boulos et al.2007)

It is important to note that one of the developers of Healthinfo Island is Guus van den Brekel, Coordinator of Electronic Services at the Central Medical Library of the University Medical Centre Groningen, the Netherlands. This fact may play an important role in the advice that will be derived from the research.

More information about health education practices and related activities in Second Life can be found in Appendix 3

2.7 Recruitment of Students through Second Life

Much has been published and researched about education and virtual worlds. There is considerable amount of information about the educational activities that universities are performing in Second Life. However there is almost no information available about universities using the virtual environment for attracting new students. During the desk research two examples of similar activities in Second Life were discovered.

- *Case Western University*

The majority of universities and educational institutions present in Second Life use the virtual world for academic purposes, such as online education and training. The Case Western University may be the first university to use it for recruiting high school students as well.

The University invites new students to visit its new virtual campus in Second Life. Most of these students have already had most of their general question answered through campus visits, but Second Life gives them the opportunity to get first-hand information about different majors and how they are organized as well as meeting enrolled students and have an informal chat about different university events and activities. Furthermore prospective students who come to Case's Second Life campus can explore various campus facilities presented as they are in reality. Case's Office of Undergraduate Admission considers Second Life as a new way to reach prospective students. All high school seniors admitted to Case University receive an invitation to visit Second Life and explore the University's innovative use of technology for supporting their success and their learning experience. According to Jonathan Wehner, associate director of undergraduate admission at Case (as cited in Cool, 2007), the Case Western Reserve University admission project is all about distinguishing Case University from other schools and giving their admitted students another opportunity to really get to know them before they make the all-important decision as to where they should enroll.

- *Edinburgh University*

There is some debate about whether spending money on virtual learning platforms is worthwhile, but some university marketing departments have already spotted the potential

that having a virtual presence offers in terms of college branding and attracting future generations of computer literate and Second Life savvy students.

Hamish MacLeod, senior lecturer on the MSc in e-learning course at Edinburgh University explains that he has had one or two inquires about the Masters course from prospective students who have made a point of visiting Holyrood Park (Edinburgh University's Second life campus) before getting in touch-a-hint that Second Life can play a role in recruitment. (Stott, 2007)

CHAPTER THREE: STUDY OF THE ORGANIZATION UMCG

The University Medical Centre Groningen is the only University Medical Centre in the northern part of the Netherlands and therefore the final point of referral for many patients. Patients suffering from rare and difficult-to-diagnose illnesses come from Northwest Overijssel, Friesland, Drenthe and Groningen. When it comes to liver and lung transplants patients from all over the Netherlands come to UMCG.
Moreover UMCG is a center for education and research. It educates hundreds of medical professionals such as doctors and nurses annually. Furthermore the UMCG carries out hundreds of scientific studies each year. The UMCG's strength is in the close integration of patient care, education and research. This allows each to benefit optimally from the other's experience and further improve the patient care.

The UMCG dates officially from the merger, on 1st January 2005, of the (then) Academic Hospital Groningen and the Faculty of Medical Sciences of the University of Groningen.

With more than 9000 employees and 1300 beds the UMCG is one of the largest hospitals in the Netherlands. Each day, the UMCG is populated by some 15,000 people, varying from employees and students to patients and their visitors. Each year, many large congresses with participants from all the world are held in the UMCG. The extraordinary interior of the hospital is what it makes it different from all the other hospitals in the Netherlands. There are shops, gardens, lunchrooms in order to make patients less aware if the fact that they are in a hospital.

3.1 Mission and Vision

After the merger of the University Hospital Groningen and the Faculty of Medical Sciences of the University of Groningen in 2005, a discussion was initiated regarding the decision for the mission and vision of the new organization. For that purpose a lot of meetings were held and online surveys were launched in order to collect the ideas of as many employees as possible. The results led to a conference in November during which all ideas about the mission and vision were discussed.

The new mission of UMCG is: "Building in the Future of Health". This mission derives from the UMCG time-honoured tradition of fundamental and clinical translational research into chronic disease and aging.
The mission articulates the UMCG's strong focus on life processes, the course of human life, aging and its effects. This manifests itself not only in basic research, but also in the organizational structure underpinning the health care and preventive programs, as well as in the day-to-day work within the hospital.

This mission is also the title of the strategy for the future of UMCG. This plan incorporates the vision of UMCG and determines the choices that the organization makes now and in the future. A priority of the plan is the increase of the patients' satisfaction as well as the market position of UMCG and the position of the research and medical education.

3.2 Core activities

- ❖ Patient care
- ❖ Education and training
- ❖ Medical scientific research

Perfection in these three areas is what UMCG wants to achieve now and in the future. This requires sufficient patients coming to the hospital and existence of common medical complaints which require top clinical expertise. Other conditions include well educated employees, auspicious students, sufficient top researchers and excellent research facilities.

❖ *Patient care*

Patients go to the UMCG for basic care as well as highly specialized top clinical and top reference care, such as organ transplants, complex neurosurgery, neonatology, clinical genetics, In Vitro Fertilization (IVF), paediatric oncology, renal dialysis and traumatology. All medical specialties are represented, as well as education programs for all medical disciplines.

The UMCG is working in various ways to improve its quality of care and service and to treat its patients as quickly and friendly as possible. An example of this is the multidisciplinary teams in which the medical specialists relevant to a certain disease cooperate. Patients do not need to visit all these specialists individually. Instead, they can go to one outpatient clinic and have the specialists visit them.

Each department makes an assessment of the level of its care and service in order to recognize possible areas for improvement and respectively to undertake the proper measures. In this, the opinion of the patients is of great importance. Therefore the UMCG has established the "Patient interview", which is a method for regular research into the experiences and ideas of UMCG patients. Each department undertakes surveys through which the experiences and opinions of the patients are collected through surveys and categorized so that a detailed feedback can be gained concerning the quality of the given care. The UMCG uses the results of these patient interviews to further improve its care and evaluate earlier innovations.

In 2006 the number of first visit patients has increased with 2% compared to 2005, the number of operation has increased with 5% and the total daily treatments with 17%.

A milestone in the patient care was the permission that UMCG received for executing heart transplants. Now UMCG has permissions for all forms of transplants and combo-transplants. It is expected that the first heart transplantation will be executed in the second half of 2007.

An important prerequisite for good patient care is the cooperation with the different external partners of UMCG. So in 2006 UMCG has invested in improving the communication with the GPs. Furthermore in 2006 the University Psychiatry Center and the Diabetic Center were opened, through which the patient care offered for specific patient groups has improved. (Jaarverslag, UMCG, 2006)

❖ *Education and Training*

The UMCG is the largest institute for medical training in the Netherlands. This does not only entail medical education at a university level and the training of medical specialists, it offers education at all other levels as well. Doctors can further specialize at the UMCG as it houses all medical specialties. Education for nurses and paramedical professionals is also available. UMCG is very ahead in the Netherlands regarding development of new job occupations and functions in the field of patient care. Training of these new occupations is often initiated in UMCG itself and in cooperation with other healthcare and educational institutions.

Each year 650 freshmen enroll in UMCG. Of these freshmen, 440 enroll for Medicine, 60 for Dentistry and 150 for Human Movement Sciences. UMCG constantly renews its curriculum and uses state-of-the-art educational methods. The key element is competence based learning, which focuses on knowledge, skills and professional behavior. This approach has guaranteed high approval ratings by both students and by official evaluation committees.
The study of medicine earned a second place during the most recent national evaluation and usually it takes first or second place in the annual national approval survey among students. (Jaarverslag, UMCG, 2006)

In the field of medical training UMCG has placed much effort in developing new healthcare professionals such as nurse practitioner, physician's assistant and hospital physician. This enables employees to further expand their expertise, competencies and skills. Competence-focused training is what makes medicine and dentistry training programs so valuable- the renewed post-graduate programs for medical specialists as well as further training courses for care professionals. Moreover, UMCG has developed new technological training tools and facilities, including an electronic learning environment and the usage of multimedia and simulation facilities. As a result, the training given takes less time and is more effective.
One recent example of investment in education and training is the construction of the Skills & Media Center. In this training facility, healthcare professionals can learn and improve their skills in a simulated care and treatment environment. A wide variety of medical procedures- from taking blood samples to carrying out complex medical interventions are practiced on dummies and on fresh-frozen bodies.

An essential part of the education and training is the participation of foreign students and staff. In 2006, the Medical Faculty received more than a hundred of students and staff from abroad. International students came for studying a part of the curriculum, doing a clinical internships, performing a research elective, or conducting a PhD research project; international staff for research or teaching.
There are different programs through which international students and staff can come to UMCG. Some of them are the Socrates/Erasmus and Leonardo da Vinci programs of the European Union. Besides these programs, the Medical Faculty has links with universities in

USA, South Africa, Russia, Indonesia, China, South Korea, Japan and Peru to facilitate student and staff exchanges.

In 2006 UMCG was proclaimed to be the best education institute in the health care sector and received in March 2007 the award for the best educational institute in the Netherlands.

Furthermore the Medical Faculty was chosen for the best medical and dentistry study by the weekly magazine Elsevier as well as by the Keuzegids Onderwijs. (Jaarverslag, UMCG, 2006)

❖ *Medical Scientific Research*

UMCG carries out research into the causes and courses of difficult-to-treat diseases. Fundamental research and research towards patients are closely connected.

UMCG has built up an international reputation for excellence by choosing relevant subjects for research:

- Chronic diseases
- The human brain
- Quality of life
- Biomaterials

Research facilities

The UMCG has all the facilities for advanced research- well-equipped laboratories and cutting-edge specialist equipment.

Besides that UMCG is investing heavily in new facilities, such as facilities for large-scale, long-term population research. The aim of these researches is to gain more insight in various genetic and environmental factors that may cause given diseases.

Recent examples of this type of research are the TRIALS and LifeLines.

TRIALS is a long-term study that looks into the mental health of about 3,000 young people from their 10th birthday up to their 24th.

LifeLines involves the creation of a large medical databank. The research aims to give insight into the factors that make some people grow older healthy and others already at young age are confronted with chronicle diseases.

Training of young researchers

The quality of scientific research in UMCG high international level and it continues to increase. In 2006 the number of medical promotions increased with 20% and reached 117. The scientific publications increased with 9% and reached 1,250.

The UMCG maintains excellent training facilities- the Graduate Schools, which are:

- GUIDE (Groningen University Institute of Drug Exploration)
- BCN (Behavioral and Cognitive Neurosciences)
- BMSA (The Institute for Biomedical Engineering, Material Science and Application)

- SHARE

Research is performed in each Graduate School according to its specialty but very often it is multidisciplinary and in cooperation with other top international research institutes.

The Graduate Schools offer top level research-oriented Master's degree courses, doctoral-research training, we well as a special course for medical researchers called the Junior Scientific Master Class. In 2006 the first MD/PhD students from this course graduated.

The course was established in 2001 and it is unique for the Dutch education. It offers students of Medicine and Dentistry the possibility to combine their study with a following PhD program with total duration of 8 years. In this way students save2 years because the study is 6 years and the PhD is 4 years. In the past 5 years 55 students were accepted for this course.

There are more than 1400 researchers from all over the world employed in UMCG. Each year more than a hundred young scientists graduate from the training courses within UMCG. (Jaarverslag, UMCG, 2006)

The University Medical Centre Groningen and the University of Groningen offer three Joint Research Masters:

- Behavioral and Cognitive Neurosciences
  Unraveling the complexity of brain and behavior
- Clinical and Psychosocial Epidemiology
  Bridging the gap between medicine and psychology
- Medical and Pharmaceutical Drug Innovation
  Finding new answers to chronic diseases

3.3 Organizational Structure

Consideration for quality of patient care is central to the organizational structure of the UMCG.

Formerly there were twenty four independent medical departments. In July 2005 the decision was taken to restructure these into six sectors. The old organizational structure, designed twenty years ago, had functioned adequately for a long time but was no longer suitable for today's situation, where patients demand care adapted to their needs while at the same time hospitals face an increasing scarcity of skilled personnel and a tighter financial climate. Each sector is independent unit responsible for its own organization regarding nursing, medical affairs and budget. Services and facilities support the departments.

In July 2005 UMCG undertook a big reorganization, which was and still is quite unclear for most of the employees in the organization. It is very difficult to explain the reorganization and the organizational structure because it is changing already again.

Before the reorganization UMCG organizational structure consisted of Board of Directors (Raad van Bestuur), Central Staff (Directoraten) for Communication, Finances, Control,

Education, ICT etc. , and twenty one medical departments and Care facilities (such as Laboratories, PET Center etc.) The Medical specialists were responsible for all the policies. The Board of Directors wanted to bring more managers into the organization to cope with the decreasing budgets and customer-related issues. The free market in the Netherlands brought along greater competition between hospitals and the need for managers in the organization became visible. Hospitals nowadays need to maintain stable and good relations with insurance companies and GPs in order to receive more patients.

All this led to the decision of reorganization in UMCG. It was decided that UMCG should be divided in six sectors with couple of departments (all decentralized) and Care facilities and with a Sector-Director above each sector. Above the sectors is the Board of Directors with an UMCG Staff, Building and Infrastructure (parking, buildings, security) and Services (ICT, restaurant, logistics etc.).

Each Sector consists of: Sector Director, Head of Departments, Managers Care Facilities and Administration Office.

The Heads of the Departments are hierarchic under the Board of Directors, the Managers, Care facilities and the Heads of Departments work closely together. Each Head of Department develops a year plan and discuss it once a year with the Sector Director and the Board of Directors.
Essential in the new structure is that the Heads of Departments are mostly medical specialists, whereas the Sector Directors are more like managers.

The old and the new Organizational Structure diagram can be found in Appendix 4

CHAPTER FOUR: METHODOLOGY

4.1 Research Approach

For the present research desk and field research were conducted in order to gather relevant data.

4.1.1   Desk research

Desk research has been conducted to collect secondary information about the following aspects of the research:

- Second Life in general- statistics, previous research on Second Life, educational possibilities in Second Life.

- Possibilities that Second Life offers for businesses and non-profit organizations

- Social network services and their applications in the communication field

- Universities and big health institutions in Second Life and their activities there

- The University Medical Centre Groningen

- Behavior models and communication theories accessible from previous research studies

4.1.2   Field research

For the present project, qualitative field research was conducted in order to gather primary information. Applying qualitative research approach involved conducting semi-structured interviews and key informative interviews, and participating in meetings and presentations.

❖ *Semi-structured interviews*

A total of 14 semi-structured interviews were conducted with the following participants:

- 3 Master students
- 7 PhDs
- 4 Post-doctors

Semi-structured interviews are conducted with a fairly open framework which allow for focused, conversational, two-way communication. They can be used both to give and receive information. The majority of questions are created during the interview, allowing both the

interviewer and the person being interviewed the flexibility to probe for details or discuss issues.

These kinds of interviews have high validity because the participants are able to talk about a given issue in detail and depth. Furthermore the meanings behind an action may be revealed as the interviewees are able to speak for themselves with little direction from the interviewer. (Sociology Central, 2008)

In that sense semi-structured interviews are very suitable for answering two of the main research questions:

- What are the steps that a potential Master and PhD students undertake when looking for a program and university?

- How do Master and PhD students perceive social network services and Second Life in particular?

As mentioned previously, during this study the Sense-Making Approach, developed by Brenda Dervin (1989) was adapted to the purpose of the research. Semi –structured interviews were combined with this method for gaining more insight into respondents' approach of gathering information about suitable program.

The interviews were divided into two sections according to the research purpose. The first part of the interview contained questions about the educational background of the respondents, aiming to understand the information gathering process of the participants regarding the choice of program and university. The second part contained questions aiming to gain insight into the participants' attitudes, motivations and reactions towards the use of social network services and Second Life. In addition the researcher showed the participants Second Life and two short informative movies about the educational possibilities in Second Life with emphasis on health issues.

For recruitment of participants, emails were sent to international Master students, PhDs and Post-doctors. The email consisted of brief explanation of the research and information about Second Life. Furthermore information was provided about the content of the interviews.

The questions of the interviews are presented in Appendix 5

Supplementary questions were added to clarify and elaborate on the points raised. The researcher was open to all the additional questions that the respondents had during the interview. All interviews were recorded with the permission of the participants.

❖ *Key informative interviews*

A key informant is an individual, who as a result of their knowledge and previous experience has access to information valuable for the researcher, such as insight into the context of a program or project and can assist in clarifying particular issues or problems. (World Bank, 2007)

A total of 4 key informative interviews were conducted with key persons from UMCG involved in the recruitment process of international doctors, Master students and PhDs as well with people from the Wenckebach Institute involved in E-learning and Simulations. All interviews were recorded with the permission of the participants.

❖ *Meetings and Presentations*

The researcher, together with the project team members, participated in meetings with individuals from UMCG who might be interested in Second Life and its applications in health and medicine. During these meetings different aspects of Second Life were shown to the participants followed by discussions about different possibilities in using it.

4.2 Research limitations

The qualitative research was limited by number of situational factors. First, the internal information about the organization was for most part in the Dutch language, which was a challenging task for the researcher. Language skills and selectivity were essential during the organization research. Second, the undergoing organizational changes made the mapping process of the organizational structure a complex process. Third, qualitative research methods are highly time-consuming which led to the prolonging of the research. And last, but not least, research limitations occurred due to availability of participants and willingness to take part in the interviews.

4.3 Data Analysis

All the semi-structured interviews were recorded and transcribed. The interviews were analyzed using the constant comparative analysis. This is a method which involves taking one piece of data (one interview, one statement, one theme) and comparing it with all others that may be similar or different in order to develop conceptualizations of the possible relations between various pieces of data. (Thorne, 2000)

All the key informative interviews were recorded and transcribed. The outcome of each interview was summarized in a brief report.

CHAPTER FIVE: RESEARCH RESULTS

In this chapter the results derived from the field research are presented. The transcribed data, obtained from the semi-structured interviews, was carefully read line by line. Afterwards it was divided into meaningful segments that were then coded. The codes were examined, sorted into groups and compared among each other whereby it was important to look for patterns and connections. Concepts were developed and the differences and similarities between different interviews on the same concept were combined. The results are then presented into categories.

The results are structured per research method applied as follows: semi-structured interviews, key informative interviews, meetings and presentations.

5.1 Results from semi- structured interviews

Typology of the respondents

Gender
Male- 5   Female-9

Country
Turkey- 1; Serbia- 2; Italy- 3 Bulgaria;- 1 Romania;-1 South Korea;- 1 China;- 4 USA- 1

Position
Research masters- 3; PhD- 7; Post- doctors- 4

Age
The average age of the respondents is 30

5.1.1 Regarding previous education and information gathering process

From the 7 PhDs, 1 did obtain Master degree from the University of Groningen.
From the 4 Post-doctors, 2 obtained their PhD degree from the University of Groningen.

❖ *Immediate planning after degree obtained prior to current program*

The participants were asked what their immediate planning was after obtaining a degree prior to their current program.
Eleven of the respondents knew they wanted to continue with their education. However four of them first worked for some time because they were not able to find suitable program. One respondent was already in Groningen when starting to search for a program. She was not able to find any position and therefore had to take some time off. Two of the respondents planned to work immediately after obtaining a degree at their home countries. However it was difficult

for them to find a well-paid position in their own country. One respondent wanted to take a year off, but she couldn't do it because of pressure from the family members.

❖ *Information gathering process*

The participants were asked to describe the manner in which they searched for a program to continue their education.

Eight of the respondents stated that their main tool for searching was internet. They were searching through Google for medical universities and program of their specialty. Out of these eight respondents, one attended an educational fair in the home country, where different universities from all over the world were presenting their Master and PhD programs. One participant visited a conference held in Groningen where she received all the information she needed. Another respondent had a personal contact with a professor from University of Groningen who was a guest lecturer at the respondent's home university.

Five of the respondents stated that they didn't look at all in internet and obtained information about their future program from a personal contact.

One respondent went to an agency in her home country where she was provided with websites of different medical universities worldwide. It was her own responsibility then to visit these websites and gather the information she needed.

The participants were asked to share what was important for them when looking for a program and choosing a university. The majority of the respondents stated that the topic of the program was the most important issue and it determined their decision to choose a university. Six of the respondents mentioned the reputation of the university was of great importance as well. For seven of the participants the location of the university was important. They also stated that they wanted to continue their education in Europe and preferably in country where the program will be in English language. Two respondents mentioned the financial conditions as important and three respondents stated that the working environment was something they took into consideration. One participant pointed out the publications of professors in the given university as a very significant indicator for the quality of a program.

For the majority of the respondents the information about the universities and their programs was absolutely not enough, including the one about the University of Groningen and UMCG. At the same time they stated that they were overloaded with information which was not relevant for them. The process of gathering information was very time-consuming. They could obtain only general information from the university website and were confused by the fact that they were redirected to different sites all the time. For three of the respondents there was not enough information available in English language. Two of the respondents stated that they were not taught in their home country how to look for information, how to search for academic publications and how to network. They experience this as a great disadvantage resulting from the rather undeveloped educational system in their home countries. Only two respondents were able to obtain enough information about their program through the internet and didn't need any further search.

Almost all of the respondents who were lacking information solved the problem by contacting people from the university department of the chosen program. They emailed professors and study advisors and asked for all the information that was not available for them. One participant visited a website for students of her home country who are studying in the Netherlands. There she could ask experienced students for information and advice regarding not only the program but also the social life in the Netherlands and more particularly in Groningen. This respondent pointed out that this was extremely helpful and that she still uses this website. One respondent stated that she had the chance to have a face-to-face meeting with a student from the program she wanted to participate in. During this meeting the respondent was able to ask all the questions she had regarding the program but also got information about the study life in Groningen and the living conditions. Her words were "I could never get this information from internet!" According to the respondents the best way to obtain all the information one needs is through personal contact.

❖ *Strengths of the program of choice*

The participants were asked to point out what they like most about their program. The results of this question could be significant in case of positive advice regarding recruitment of PhDs and Master students through Second Life as the response could generate ideas of what can be highlighted in the representation of UMCG in the virtual environment.

Nine of the respondents pointed out that the freedom in the educational system is what they mostly like. Having the freedom, especially from scientific point of view, is something the participants consider very important for the success of their projects and for their future careers. For seven of the respondents the independence and self-responsibility they have are of great importance. Three respondents mentioned the support and respect given from the educators as something they really appreciate. In their home country these participants were not given the respect they deserve and were left alone to solve all problems and difficulties. The practical approach in the program is what two of the respondents value a lot. In their home country these respondents did not have active role in the learning process and were not taught to be initiative and self-responsible. Other favorites of the respondents include the multidisciplinary approach of the program, collaboration among colleagues and the international working environment.

5.1.2 Regarding use and attitudes towards social network services

Before continuing with this part of the interviews, the participants were given a demonstration on Second Life with emphasis on the applications for health issues and education.
It is important to mention that none of the participants has heard of Second Life before.

❖ *Usage of Social Network Services*

The respondents were informed what Social Network Services are and asked to point out if they use any and if yes, which ones.

All the participants use emails on a daily basis for academic and social purposes. Eleven respondents use Skype and MSN as means to communicate with family and friends almost on a daily basis. However 3 respondents mentioned they are careful with the usage of this social software as it can be very addictive. Three participants use Facebook or Hyves but only for socializing. Two respondents use blogs occasionally for academic purposes, but do not find these very useful. Forums are used only by 4 respondents and only for pleasure and 2 for academic purposes, but rarely. Five respondents stated they have no time to lose for any other social software other than email and instant messaging.

Only two respondents are aware that some of their colleagues participate in social network service such as Facebook, but they do not consider it important to join the group.

Few respondents use occasionally the NESTOR (Blackboard), but they don't find it useful and use it only to check for information on some courses.

❖ *Advantages and disadvantages of Social Network Services*

One advantage, pointed out by the respondents, is that social network services are cheap or totally free to use. Another one is that they enable users to stay in touch with family and friends. The participants consider these as very important advantages having in mind that they are far away from home.

All respondents pointed out the lack of personal contact and nonverbal language as the biggest disadvantage of social network services and particularly of instant messaging. They consider an online communication to be not so real as they cannot see the person behind the computer and respectively cannot see what this person is thinking and doing while communicating. One cannot express feelings, emotions and gestures through a computer. Some respondents mentioned the danger of becoming addicted to social network services and spending too much time online instead of concentrating on work and other important matters in real life. Respondents expressed their fear that the modern technologies are useful but they are reducing the face-to-face contact among people and this is something to be worried about.

❖ *Second Life and education*

The participants were asked if they can imagine using Second Life in their program and if yes, to elaborate on ideas about how it can be involved.

The majority of respondents can imagine Second Life as platform for exchanging academic information and collaboration among professionals in their field from all over the world. However all respondents stated that Second Life and social network services cannot replace real life communication and real life activities. Four respondents mentioned that Second Life can be very useful for undergraduate students of medicine as the virtual environment has the advantage of visualization which can make the learning process more interactive and interesting. Two respondents do not see any usage of Second Life because they consider that experiments and research should be done in the traditional way in real life. Furthermore they are concerned with the credibility and reliability of the users in Second Life and the information proved there. Two respondents do not have any opinion on that matter.

❖ *Second Life as recruitment tool*

The participants were asked if they see any possibilities for Second Life for being used as a tool for recruiting more international Master students, PhDs and post-doctors. Furthermore they were asked to elaborate on ideas about what they would like to see in the Second Life UMCG that can trigger their interest and influence their decision to choose a program there. It is important to mention that participants were told that they would have been redirected to Second Life from a UMCG website or brochure or another communication tool.

Two respondents do not see any possibilities at all for Second Life as a recruitment tool. They consider a 3D virtual tour on a website as better than a virtual world. Most of the respondents doubt that Second Life can be useful for attracting more international students. They think that this virtual world is too new and a lot of people are not familiar with it. They also doubt that potential PhDs, Master students and post-doctors would be interested in registering and participating in Second Life. Nevertheless in case the respondents were redirected to a virtual UMCG in Second Life, they mostly would like to see there the facilities that the organization has for performing experiments. For the respondents the labs are like second home and they are very interested in what these look like in UMCG. Furthermore they think having an International Info Desk in Second Life would be of great help for potential students. The majority of respondents stated that the key point of Second Life is the interaction and therefore it is important for potential students to have the possibility to get in touch and communicate with representatives from UMCG. They can see the International Info Desk in Second Life as a platform where they can be able to obtain all the information they need from one place instead of being redirected from website to website.

5.2 Results from key informative interviews

5.2.1 Human Resources Department (HR)

A key informative interview was conducted with the Recruitment Officer of the Human Resources Department in UMCG in order to obtain insight in the recruitment process of international medical doctors. Furthermore the interview aimed to evaluate the opinion of the Recruitment Officer of this department about Second Life as a recruitment tool. A summary of the interview is presented below.

Whenever a department within UMCG is in search of an international doctor, they communicate that with the Human Resources Department. A meeting follows during which it is clarified how many doctors are needed and when. Afterwards the HR makes a plan for getting the attention of the target group. High input is used from the medical department as the professionals there have insight as to where given doctors can be targeted. HR uses this information and recruits mostly by placing advertisements in special medical magazines. A short story about the hospital is given with the description of the vacancies and link to UMCG website for more information. An important part of the advertisement is to provide information about all the matters related to moving to the Netherlands and Groningen, such as

housing, insurance, visa, etc. However, the advertisement only is not enough to attract international doctors. The targets should feel they are special and for that reason special visits to UMCG are organized, with a program to see the working environment, to get to know the hospital but also the city of Groningen. The personal touch is an important feature of the recruitment process organized by HR.

The medical departments also participate in the recruiting process by visiting medical conferences and spreading brochures and other promotional tools to colleagues from abroad. Networking is considered to be very important.

In addition to placing advertisements in magazines, international doctors are targeted also through job websites such as Academictransfer.org. However applications coming from these sites are not good. A lot of people that are not target of UMCG are sending CVs, which are incorrect and irrelevant.

HR targets mainly German doctors, such as anesthesiologists. UMCG can and would like to have more international doctors but only if there are not enough Dutch doctors. The language is a big problem for the international doctors as they have to learn Dutch in order to be able to communicate with the patients and to read all the protocols and patients' files. It is a must that the organization develops some strategies to reduce this problem by introducing English for example for the patients' files. UMCG would like to have many international doctors but it is not really ready yet.

With doctors in research it is different as they are performing the research in English.

The interviewee is familiar with Second Life and even has an account. She considers Second Life to be hype and nothing else. She knows doctors are not to be found there, and from reports she and her colleagues know how doctors think and where and how they look for information and vacancies. And that is absolutely not in virtual worlds like Second Life.

She considers new technologies and developments to be important but she thinks that first a broad research should be made about Second Life with proofs that doctors such as radiologists or anesthesiologists can be found there. At this point she says absolutely "No" to Second Life. The HR department knows that the recruitment channels they are using now are working very well and they know where their targets see and read about UMCG.

The interviewee visited the job agency Randstad in Second Life and was very disappointed. There were no activities and it was empty. According to her, companies only make advertisement that they are present in Second Life but perform no activities there and have no proof that Second Life helped in increasing their customers. She believes that much more research is needed for Second Life and at this stage she does not see any possibilities for attracting international doctors by this mean. However she doesn't exclude the possibility for anticipating in Second Life in future.

5.2.2 Wenckebach Institute

A key informative interview was conducted with the head of the Wenckebach Institute, which is part of the UMCG. The Skills & Media Center is the newest facility developed by the institute. In this training facility healthcare professionals can learn and improve their skills in a simulated care and treatment environment. A wide variety of medical procedures-

from taking blood samples to carrying out complex medical interventions are practiced on dummies and on fresh-frozen bodies.

The aim of the interview was to get more information about the usage of the Skills & Media Center as well as to obtain the opinion of the head of the institute about Second Life.
A summary of the interview is presented below.

The Wenckebach Institute is responsible for the further education of all professionals in the field of medicine and nursing in the whole UMCG. The new skill lab is a very innovative project, with a lot of possible simulations for professionals and is especially good for simulating surgery and detailed intervention. A human-patient simulator is very appropriate for acute and emergency care and anesthesiology.
Furthermore the institute has recently developed an online simulation game called "Gaming in the Health Care" which is a platform for training the professionals in dealing with dementia, aggression and legislation. The e-learning is another feature which offers a lot of opportunities for training and is obligatory for the nursing education.
Many professionals are aware of the existence of the Skill lab, but it is very difficult to make them use its facilities. Once they come and see the possibilities that the lab offers, they are very enthusiastic about it and keep on coming back. The real problem is to let them understand the importance and the advantages of using the Skill lab and respectively make them visit it.
Doctors and nurses are the main target of the skills lab. Doctors are better at using the games and simulators and better at using computers in general. Nurses do not have much access to computers at their workplace and after finishing work, they do not want to do anything related with work. PhDs and researchers don't use the facilities as the Skill lab is still in early phase of development and regarding this target group. It is very interesting to see how people learn in Skills laboratories but the program of the PhDs and researchers is different and doesn't fit into the concept of the Skill lab and the e-learning.

The head of the Wenckebach Institute has already the idea to create a virtual hospital for medical students in order to show them what happens if a patients comes to the hospital and don't receive enough information. She believes that this will be a very good medium to show students the effects of the way patients are provided with information. This is something which can be done in a virtual world. However she also stated that when talking about virtual hospital with other people, they do not take it seriously and are rather reluctant. Nevertheless, she is definitely interested in trying the different possibilities Second Life offers for medicine and health care.

5.2.3 Bureau Internationalisering van het Onderwijsinstituut in UMCG (International Office)

The initial aim of the interview was to get insight in the recruitment process of international PhDs and Master students. However during the meeting it became clear that this International Office is not responsible for this activity. Nevertheless, important information was obtained from the interviewee, who is responsible for the incoming student mobility in UMCG.
A summary of the interview is presented below.

The International Office, which falls under the Institute for Medical Education and Faculty of Medical Science, is not responsible for attracting new students. This is responsibility of the main International Office in the University of Groningen, where professionals with their own specialty are contact persons for a set of countries. A few times a year they travel to these countries in order to maintain the relations with given universities but also to establish new contracts. These contact persons also visit educational fairs around the world where they present the University of Groningen.

The International Office of the Medical Faculty provides advice and support to international students and guests. Whenever a new PhD or Research master student comes to the Medical Faculty, the International Office is contacted and the employees assist the students in matters, such as housing, visa work and resident permit, etc.

When prospective students are looking for information about a program and the student life in Groningen they can find this information on the website of the University of Groningen. If they need more specific detain they are referred to the International Office of the given faculty and the contact person for this faculty. In name UMCG is one organization, but in fact there are still two separate organizations- the hospital and the Medical faculty and this is very confusing.

The interviewee was rather reluctant towards the usage of Second Life for recruiting more international students. In the academic year 2006-2007 a total of 132 foreign students came to the UMCG for education. Only two years ago, the Medical Faculty received 60 new international students per year. She stated that 130 foreign students per year is the maximum the International Office can handle, because of shortage on personnel. The number of international students doubled for the last 2 years, but the personnel didn't. The main concern of the interviewee is that if the UMCG searches for more international students in an active way, as oppose to the incoming students from partner universities, the International office will not have the resources to support them. It is her belief that if there are to be more international students in UMCG, more efforts should be done towards increasing the personnel of the International Office.

Other than that, the interviewee can see possibilities in Second Life for creating a virtual Help Info Desk for assisting the prospective students and providing them with information prior to their arrival in the Netherlands. But then again, more personnel should be available. However she also holds the opinion that Second Life may be is just another hype which may not exist for long. Another concern she has is that the computers in the UMCG are graphically not good enough to support Second Life and there are often problems with the internet connection.

5.3 Results from meetings and presentations

Meeting and presentations were held with the following parties:

- Wenckebach Institute
- International Office
- Department of liver transplants

- International Summer Schools
- Multiple Sclerosis Society Netherlands- Groningen

During these meetings a demonstration of Second Life was shown to the participants followed by discussions about different possibilities in using it. Interest in Second Life was shown from the Wenckebach Institute, International Summer Schools and the Multiple Sclerosis Society. The parties stated they have to discuss within their own department how they should proceed further with the information they obtained about Second Life. The department of lever transplants came back recently with request for a second meeting, which will be held in the beginning of March 2008. The Multiple Sclerosis Society Netherlands- Groningen showed interest in informing MS patients about Second Life during a big presentation to be held somewhere in May 2008.

CHAPTER SIX: DISCUSSION OF RESULTS

6.1 Regarding Second Life as recruitment tool

There are several important findings, derived from the interviews with international PhDs, Master students and Post-doctors, which should be taken into consideration.

The majority of the respondents search for suitable program strictly by topic and reputation of university. Because of the specific area of interest, the information gathering process differs from that of regular bachelor students. The respondents need all the information about the future program, including details about the program, available lab facilities and the working environment. It is only understandable that the respondents are interested in the facilities, because the labs are like second home for them. They spend a large amount of time there, performing research and experiments, and therefore it is of utmost importance how these are equipped as well as what the working environment is like. During the information gathering process, the respondents were not able to find this kind of information from any university, including the University of Groningen and UMCG. Almost all of the respondents solved this problem by contacting professors and study advisors and asked all the questions they had. According to them, the best way to obtain all the information one needs, is through personal contact.

It can be argued that this can be done in Second Life, in case of UMCG being present in Second Life and representatives of the organization available for answering questions and giving information about different programs. However there are a number of issues to be taken into consideration. First, the respondents view Second Life as unreliable source for information, especially regarding such important matters related to their future program. They consider an online communication to be not so real as they cannot see the person behind the computer and respectively cannot see what this person is thinking and doing while communicating. Second, in case the respondents were redirected to a virtual UMCG in Second Life, one of the things they would like to see there is an International Help Info Desk, where they can communicate with representatives from UMCG and obtain all the information they need from one place. However this wish doesn't coincide with the statement of the interviewee from the International Office about the lack of personnel available to support all new and prospective students. It is her belief that if there are to be more international students coming to UMCG, more efforts should be made towards increasing the personnel of the International Office. As the employees of this office would be most probably the ones to answer questions in Second Life, this finding is very important and should be taken into consideration. Third, the second feature the respondents would like to see in the virtual UMCG in Second Life is the lab facilities the organization has. However it is rather doubtful that all the labs for different programs can be rebuilt in Second Life. As there are many different programs and labs, it would be extremely difficult to include each one of them in the Second Life UMCG and provide all the detailed information about these. The same is valid for the different positions offered by UMCG.

From the points mentioned above, it can be concluded that the prospective international PhDs, Master students and Post-doctors have high demand on specific information regarding their programs, which cannot be carried out in Second Life, at least not at this stage.

A significant point, raised by some respondents from East Europe, was the lack of previous knowledge on how to look for information on the internet. It can be argued that when potential PhDs, Master students or Post-doctors do not know how to look for information on the internet, then they would most certainly have difficulties using Second Life. It is necessary that prospective students have basic technology knowledge before starting to use innovations such as Second Life. Furthermore, another problem according to these respondents was the lack of enough computers in their home universities, which influenced to great extent the information gathering process. In addition, Second Life has considerable hardware demands. The minimum technical requirements are beyond the capabilities of most universities and individuals, especially with regard to graphic cards and fast internet connection. In many parts of the world, many people still do not have personal computers and the internet is not taken for granted, as it is in USA or West Europe, for example. Thus, even if potential students might have interest in visiting the virtual UMCG in Second Life, they might not have the technical support to do so.

Another important finding of the interviews with international PhDs, Master students and Post-doctors is their attitude towards the usage of social network services. The majority of the respondents rarely use any social network services other than email and instant messaging. As mentioned above in the report, the main concern is the lack of personal contact and the fact that these kind of networks are not real and thus unreliable. Furthermore, respondents expressed their fear that the modern technologies are useful, but they are reducing the face-to-face contact among people and this is something to be worried about. According to Rogers (1995), the compatibility of an innovation with existing values and needs is one of the factors that influence the adoption of an innovation. The respondents did not show any need to use Second Life and there is not really consistency with their values and beliefs about the supremacy of real life communication.

An important point made by the Recruitment Officer of the Human Resources department is the lack of proofs about companies increasing their customers through Second Life. This point can be adopted for recruitment of students as well, because in reality there are hardly any proofs for universities being successful in Second Life for recruiting students. Rogers (1995) suggest that one of the five factors influencing the adoption of innovation is the visibility of its results. In case of lack of this feature, organizations and individuals are reluctant to adopting given innovation.

6.2 Regarding education in Second Life

As revealed by the desk research more and more universities and other educational institutions are discovering the possibilities that Second Life offer for education and training. The virtual world provides a flexible environment for educators interested in distance learning, simulation, computer-supported cooperative work, and corporate training. The digital innovations allow different and new types of interactions that provide better educational experiences for students. There are more than 150 educational institutions in

Second Life that provide among other things online education and training. Some of the most successful practices are in the field of health and medicine.

An important point that may influence the adoption of an innovation such as Second Life is the fact that the Coordinator of Electronic Services at the Central Medical Library in UMCG, Guus van den Brekel, is one of the developers of Healthinfo Island in Second Life. As mentioned in the Literature review chapter, this project generally aims at providing training programs, outreach to virtual medical communities and important consumer health resources. Guus van den Brekel has high knowledge on Second Life and the health and educational practices in the virtual world. He can support all the parties from UMCG that are interested in developing something in Second Life, provide them with information and assistance. Furthermore he is involved in the experimental UMCG island in Second Life, which since recently is open for anyone who want to experiment there. This all is a great advantage which should be taken into consideration, not only regarding the educational possibilities for UMCG in Second Life, but also with regard to patients' support groups.

One of the most significant findings of the research is the fact that the Wenckebach Institute is definitely interested in trying the different possibilities Second Life offers for health education and training. As mentioned before in this report, the Wenckebach Institute is responsible for the further education of all professionals in the field of Medicine and Nursing in the whole UMCG. The new skill lab, the e-learning environment and the recently developed online simulation game, demonstrate that the institute is open towards innovations and technology in the education. According to Rogers (1995), the consistency of the innovation with past experiences and needs, the visibility of its results and the degree to which it can be experimented on a limited basis, are three of the five factors that influence the rate of innovations. In the case with the Wenckebach Institute these three factors are visible. The institute has experience with innovations, it has the possibility to try Second Life in the experimental UMCG island and there is a visibility of positive results in the field of health simulations and medical education and training in Second Life.

6.3 Regarding patients' support groups

The meetings with representatives from the liver transplant department and the Multiple Sclerosis Society Netherlands- Groningen revealed an interest from the parties in developing concepts for patients' support groups. Two more meetings with representatives are to be held in the middle of March and in May during which the possibilities for using Second Life could be narrowed down to more specific concepts.

CHAPTER SEVEN: RECOMMENDATIONS

The final product of the research are the recommendations presented below, regarding the use of Second Life as recruitment tool for international PhDs, Master students and Post-doctors and further recommendations for other activities in Second Life that might be of interest for UMCG.

❖ **Second Life as recruitment tool**

The main objective of the research was to determine if Second Life is a platform from which UMCG can benefit in the area of attracting more international PhDs, Master students and doctors. Based on the research results and their analysis it is not recommended that UMCG use Second Life as recruitment tool for these target groups.

The main arguments against using Second Life as recruitment tool are:

- The results of the research indicate that prospective international PhDs, Master students and Post-doctors have high demand for specific information regarding their future programs and positions. They need detailed information about the projects and activities they will be involved in and the most preferable and trustworthy way to obtain this information is through personal and face-to-face contact. The target groups consider social software useful to some extent but an unreliable source of information.

- In many countries having a computer and internet is not taken for granted and some prospective students may not have the technical support to access Second Life.

- The International Office in UMCG is lacking personnel and will have difficulties in supporting incoming students in general, but also in Second Life.

- No visible practices in recruiting students through Second Life. There is considerable amount of information available about the educational activities that universities are performing in the virtual world. However there are almost no evidences of universities using Second Life for attracting new students.

Taking all the above points into consideration, it would be rather irrational and risky to start using Second Life for recruiting international PhD, Master students and Post-doctors. Whereas the problem with the lacking personnel can be eliminated by employing more people, it would be almost impossible to change the attitudes of the targets towards social software and Second Life. Furthermore, the lack of computers and available internet in some countries are beyond the control of the organization and the individuals.

❖ **Further recommendations**

Additional aim of the research was to give general overview of other activities that UMCG can perform in Second Life, especially if the results from the research lead to negative advice regarding the possibilities for attracting international PhDs, Master students and doctors. As it can be seen above, this is exactly the case. Therefore the researcher presents two other recommendations which should be taken into consideration.

▪ *Regarding education in Second Life*

The research results revealed that there are many possibilities in using Second Life for education and training. The visibility of positive results in the field of health simulations and medical education in Second Life, and the experience with innovation of Wenckebach Institute are premises to recommend the implementation of the virtual world for education and training. However there are some points which should be taken into consideration. A large implementation of Second Life will require high computer processing speed, high speed internet connection and non-integrated video cards. This will cost a large amount of money if implementation is done at once. Therefore it is recommended that deployment is done step by step, beginning by offering the possibility first to student and faculty volunteers who are interested in Second Life and already posses the necessary technology. Based on the research results, the Wenckebach Institute could be considered a volunteer for experimenting with Second Life.

The research results regarding the educational possibilities in Second Life provided so far some general overview of what can be done in this field and revealed one important sector of UMCG who has interest in experimenting with Second Life. However, further research is required in order to determine which other departments within UMCG may have interest in experimenting with the virtual environment. Such research should include a survey among teaching staff and students in order to make these parties familiar with Second Life and generate their opinion as to what implications it can have for the study curriculum.

▪ *Regarding patients' support groups in Second Life*

One of the activities in which UMCG can perform in Second Life is establishing patients' support groups. As mentioned in the Discussion chapter, the liver transplant department and the Multiple Sclerosis Society Netherlands- Groningen expressed general interest in developing concepts for patients' support groups in the virtual world. The fact that these came back with request for another meeting demonstrates that they see possibilities in using Second Life within their departments. Nevertheless, further research is required in order to discover what the patients think about Second Life and to generate ideas how the virtual world can be best used for their needs and wishes.

CHAPTER 8: CONCLUSIONS

This research paper provides recommendations regarding the use of Second Life as recruitment tool for international PhDs, Master students and Post-doctors in UMCG as well as recommendations in relation with other applications of Second Life of interest for the organization.

The research results revealed important aspects of the information gathering process of international PhDs, Master students and Post-doctors with regard to prospective programs and positions. Furthermore it was discovered that the targets have rather negative attitudes towards use of social network services, especially for the purpose of obtaining reliable information. Moreover it was ascertained that in some countries having computer and internet is not as common as it is in USA or West Europe, for example. Although over the last 10 years internet and social software are booming, it should be considered that not everywhere in the world people have access to these technologies, which is not only limiting their technical knowledge but also influencing their views on internet and modern technologies. Based on the research results and their analysis the logical conclusion was not to recommend the use of Second Life as recruitment tool for international PhDs, Master students and Post-doctors.

In the same time positive recommendations were made regarding education and training in Second Life. These were based on the positive results in the field of health simulations and medical education in Second Life, which were derived through desk research and the definite interest of the Wenckebach Institute to experiment and explore the different possibilities he virtual world offer for education. Nevertheless it is advisable that further research is conducted in order to determine what teaching staff, students and professionals think of Second Life and to generate their opinion as to what implications it can have for the study curriculum.

Another positive recommendation was presented with regard to possibilities for establishing patients' support groups in Second Life. The meetings with representatives from the lever transplant department and the Multiple Sclerosis Society Netherlands- Groningen revealed an interest from the parties in developing concepts for patients' support groups.

One of the most important matters when integrating an innovation in a community, group or at the work place, is to find out how the individuals, who will make use of it, think about and perceive the new technology. Because even if there are a lot of positive reactions from other people and institutions, these will be worthless for the organization if the people who are supposed to use it have a negative attitude and are reluctant to make use of the innovation. Each individual has his own beliefs, views and attitudes and therefore it is important that these are taken into consideration before making steps towards adopting a new technology.

It is the strong hope of the researcher that this study has contributed for achieving insight into the process of adopting an innovation as well as that the recommendations provided will assist the organization in deciding whether and how to employ Second Life.

APPENDIX 1

Second Life statistics

Economic Statistics

As per Wednesday, February 27, 2008

Population

Residents Logged-In During Last 7 Days	485,079
Residents Logged-In During Last 14 Days	632,669
Residents Logged-In During Last 30 Days	913,907
Residents Logged-In During Last 60 Days	1,355,216
Total Residents 1	12,625,503

Land

Land Sales by Resident

Month	Total Square Meters Sold by Residents	Avg L$ Paid Per Square Meter
February 2008 - MTD	51,826,848	6.6518
January 2008	76,902,544	6.5306

Land for Sale Today

Residents With Parcels for Sale	6,481
Total Parcels For Sale	38,574
Total Square Meters for Sale	19,540,736

Islands Added

Month	Islands Owned (End of Month)	Islands Added (During Month)
February 2008 - MTD	12848	451
January 2008	12397	497

Square Meters Auctioned

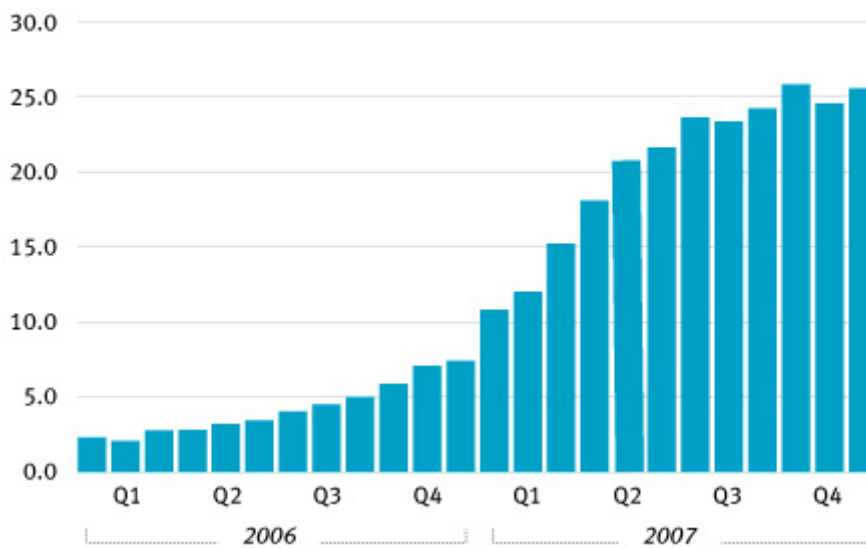| Month	Square Meters
2008 January	1,498,256
2008 February - MTD	4,907,792

Source: http://secondlife.com/whatis/economy_stats.php

Economic Statistics: Graphs

Million Square Meters of Second Life Land
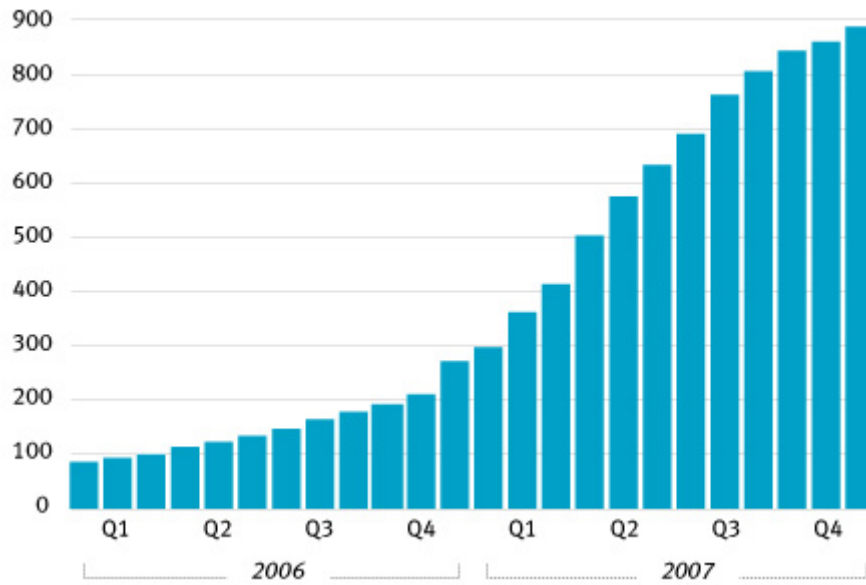
User Hours (in Millions)

Source: http://secondlife.com/whatis/economy-graphs.php

APPENDIX 2

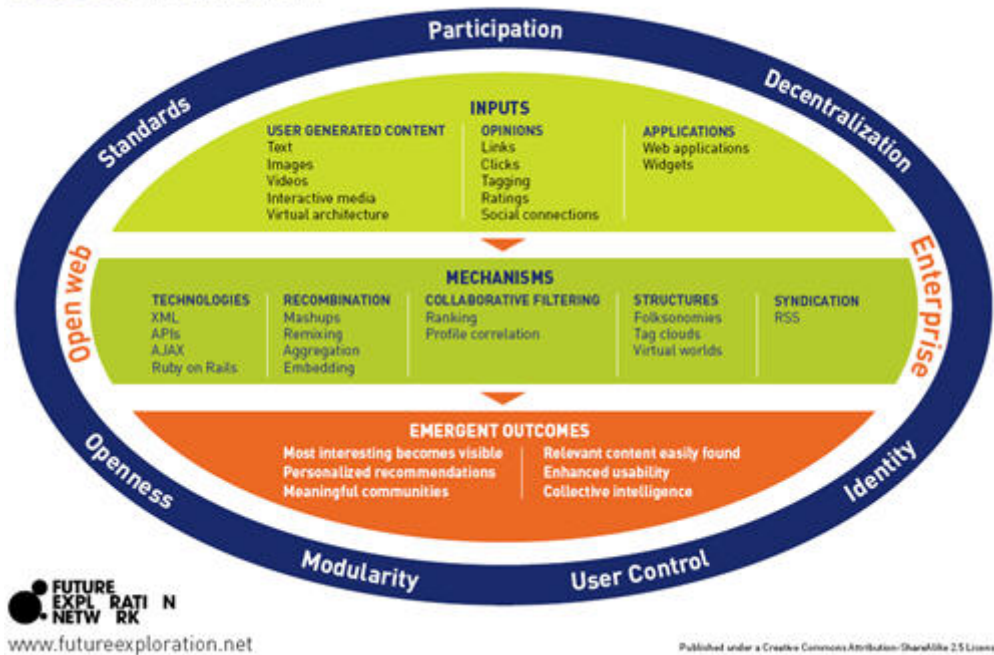## WEB 2.0 and Virtual Worlds

❖ **WEB 2.0**

Web 2.0 is a second generation of web-based communities and hosted services, such as social-networking sites, wikis, blogs and folksonomies, which aim to facilitate creativity, collaboration and sharing among users.

Web 2.0 Landscape

Web 2.0 Framework

WEB 2.0 Framework

Source: http://www.rossdawsonblog.com/weblog/archives/enterprise_20/

❖ **Virtual Worlds**

All virtual worlds have six features in common:

- *Shared Space:* the world allows many users to participate at once.
- *Graphical User Interface***:** the world depicts space visually, ranging in style from 2D "cartoon" imagery to more immersive 3D environments.
- *Immediacy:* interaction takes place in real time.
- *Interactivity:* the world allows users to alter, develop, build, or submit customized content.
- *Persistence:* the world's existence continues regardless of whether individual users are logged in.
- *Socialization/Community:* the world allows and encourages the formation of in-world social groups like teams, guilds, clubs, cliques, housemates, neighbourhoods, etc.

Virtual worlds are used in several ways:

- *Commercial Gaming*

Commercial gaming involves character-focused avatars, progression through an interactive narrative storyline, and a series of competitive events. The most famous commercial gaming world is World of Warcraft, which has millions of users.

- *Socializing / Online Community Building*

These worlds are focused on socialinzing and offer open-ended experience which is influenced by the culture of the text-based chat rooms. Users communicate with others but also create personal space, such as homes.

- *Education*

Some virtual worlds have been created for educational purposes. In most cases, educational worlds are sponsored by academic institutions or nonprofit organizations, although some educational worlds are sponsored by corporations.

- *Political Expression*

Virtual worlds can serve as platforms for political debates and expressions. There are some cases in which virtual words have been created for the purpose of political debate or experiments in self-governing online communities.

- *Military training*

U. S. Military use virtual worlds to recruit potential soldiers through "America's Army". Foterra Systems is working with military groups for developing training simulations.

Source: http://www.virtualworldsreview.com/info/whatis.shtml

APPENDIX 3

Some health education and health related activities in Second Life

❖ Nursing educational simulator

In November 2007, a prototype simulator in Second Life was utilized to train medical-surgical RN program students in three sections of the NURS 211 course at Tacoma Community College in USA. The students have the possibility to apply basic concept in assessment and treatment of a patients, with an acute heart attack, for example. The simulator is used in face to face courses to demonstrate application of concepts covered in other medical problems such as brain, burns, kidney and liver.

Source: http://jsvavoom.blogspot.com/2007/11/ed-simulator-in-second-life.html

Note: An interesting demonstration of the simulator can be seen at: http://youtube.com/watch?v=UjLDe-ca-sw

❖ **The U.S. Centres for Disease Control and Prevention (CDC) in Second Life**

The site of CDC in Second Life is for sharing public health information in an online cyber community. The site offers health information to residents of Second Life as part of their online experience. CDC's Second Life is linked to www.cdc.gov. Through online metrics CDC is able to determine can determine what kind of information people are seeking as well as how much time they spend in reading it. It allows the organization to improve it services through its websites and in response to public investigations.

Source: http://www.cdc.gov/about/stateofcdc/everywhere/secondLife.htm

Source: http://digicmb.blogspot.com/2007/01/podcast-cdc-in-second-life.html

❖ **Dutch NGO Island (Goede Doelen eiland)**

The island is cooperation between the Dutch Red Cross and the Dutch Fund for Disability Sports and is sponsored by ABN Amro and the Free University of Amsterdam. The island has two parts- a disaster zone for the Red Cross and a stadium for raising awareness for disability sports. The aim of the project is to raise commitment to the Red Cross and to find new ways of fundraising.

❖ **The US National Multiple Sclerosis (MS)**

The US National Multiple Sclerosis Society has a site in Second Life and one of the activities it performs there is fundraising. The organization's Southern California Chapter together with sponsors organized a MS-Fly event which aim was to increase the fundraising and awareness for multiple sclerosis.

Source: http://secondlife.com/newsletter/2007_07/

❖ **MD KIOSK**

The interactive health education island offers over 125 online subscription health and procedural videos for patients and doctors. Topics include common diseases, such as diabetes, high blood pressure, allergies, asthma and others. The aim is to provide more entertaining and pleasant form of patient education. The content of the information provided is reviewed by board-certified physicians from different specialities nationwide. The site also offers over 40 common medical and surgical procedures, such as angioplasty, skin resurfacing, colonoscopy and Botox injections, to assist doctors and patients in the process that must occur before certain procedures are performed.

Source: http://www.mdkiosk.com/
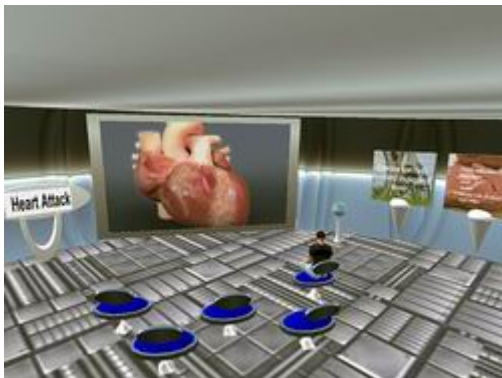
❖ **Virtual Palomar West Hospital: Hospital of the future**

Palomar Pomerado Health and its partner Cisco Systems developed in Second Life a simulated version of Palomar West Medical Campus, which is due to open in real life in San Diego in 2011. Virtual visitors can tour the facilities and also test some technology concepts that are likely to be deployed in real life hospital. For example, they can test RFID enabled bracelets that can track patients but also guide them to the appropriate areas of the facility, based on what kind of health service they are supposed to have.

Source: http://www.informationweek.com/showArticle.jhtml?articleID=206801783

❖ **Genome Island in Second Life**

The island is a rich source for educational information on genetics, genomics, history of genetics and other genetic related subjects. Students can enter a giant cell and interact with the intercellular structures, watch 3-D tutorials or videos on bacterial transformation, chromosomes, etc. Furthermore they can obtain information about DNA sequencing and can interact with replicas of classic genetic experiments, repeat them, gather the data, make a quiz, etc.

Source: http://scienceroll.com/2007/04/11/genetics-in-second-life/
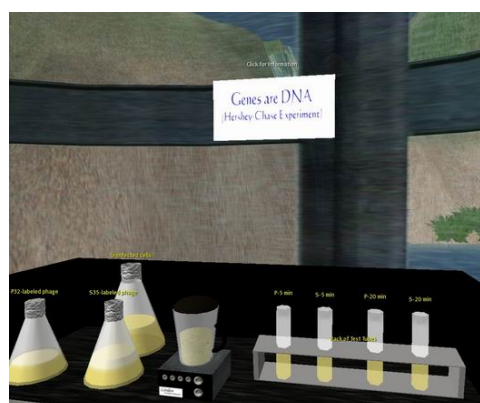
❖ **Fantasy Island**

The Live2Give, a Second Life community for people dealing with cerebral palsy and similar physically disabling conditions, has developed the Fantasy Island. The only inhabitant there is an avatar called Wilde Cunningham. In real life, behind this avatar are nine people, who are all visiting the same day-care centre for adults with cerebral palsy and other neurological diseases. Many of them are in wheelchairs and unable to complete simple tasks on their own. However when they are in Second Life, they can walk, paint, build, talk and run, which higher their self-esteem.

Source: **http://www.redherring.com/Home/11599**

❖ **Virtual Neurological Education Centre (VNEC)**

VNEC, developed by the University of Plymouth in UK, offer a virtual simulated experience, where people can actively expose themselves to the most common symptoms that a person suffering from a neurological disability may encounter. Visitors can select different neurological symptoms which animate their avatar and lead to limitation of movement and coordination. The purpose of the project is to raise awareness of neurological disabilities and provide people with disabilities support, information and rehabilitation training.

Source: www.vnec.co.uk

Source: http://healthinfoisland.blogspot.com/2007/03/virtual-neurological-education-centre.html

APPENDIX 4

Organizational Structure- (only printed copy)

APPENDIX 5

Initial questions semi-structured interviews

Education part

1. What is your name?
2. How old are you?
3. Where do you come from?
4. What is your current program/position?
5. Since how long have you been in the Netherlands?
6. What is your educational background?
7. What was your immediate planning after finishing the degree prior to your current program?
8. How and where did you look for information for suitable program/position?
9. What was most important for you when looking for a program/position?
10. Did you encounter any problems during the information gathering process? E.g., not enough information, etc.
11. If yes, how did you solve this problem?
12. Why did you choose exactly the university of Groningen and UMCG?
13. What do you like most about your current program/position?

Social software /social network services part

1. Do you use any social software/social network services?
2. If yes, which one?
3. For what purpose do you use these?
4. How often do you these?
5. What advantages and disadvantages can you see in using social software/social network services?
6. Are you aware of any social network services that your colleagues use?
7. Is your current program in any way involved in the use of social software/social network services?
8. Do you think a virtual world like Second Life can be useful for your program?
9. Do you see any possibilities for Second Life being used as recruitment tool for international PhDs, Master students and Post-doctors?
10. If you were to decide now where to do your Master/PhD/Post-doctor position, and you were redirected to a virtual UMCG in Second life, what would you have liked to see there that can trigger your interest and influence your decision where to continue you education?

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