

# Project Virtual Worlds



**Institute for Communication and Media**

Constituent: Corné Kox

Teachers: Roel Hoving  
Josef Sennekool

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Class: IDV4a

Students: Ronald Boekhoudt (281303)  
Cécile Houkes (276596)  
Jochem Koens (277922)  
Casper Reininga (288716)  
Vilija Naruskevici ( )  
Arie Schenk (272389)  
Kim Ziengs (277474)

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## 1 INTRODUCTION

SurfNET and Kennisnet started a pilot to see what the added value of virtual worlds is for educational purposes. We, as a project group, are participating in this project. We do this for our major Information Services. We want to find out if virtual worlds are suitable for educational purposes. We also want to know if communication and collaboration are possible in virtual worlds. The question we are going to answer in this report is:

*'How can Active Worlds be useful as educational tool for student groups (like ourselves)?'*

Our target with this project is: investigate the possibilities of a virtual world after it has been build, to experience and research what the possibilities are for our future work field and in addition to research the collaborative and communicative possibilities for project work.

We mainly looked if virtual environments can have additional values to the educational system. In short: what is the added value of virtual environments for educational purposes?

Virtual worlds offer new ways to collaborate in projects, people can be in the same place with each other to have a discussion while being at home and also have access to the same databases as at school. There is a possibility to give lectures and also project presentations. A virtual world can function as an addition to regular education, besides systems like Blackboard.

We wrote an ideal concept for the world. Some of us tried to build our ideal concept. In addition we did desk research and literature research to support our main statement and sub questions.

The report is divided in 11 chapters. The first chapter explains what virtual worlds are and how they have been developed. The second chapter gives information about collaboration inside virtual worlds. In the third chapter we are going to discuss the connection between virtual worlds and education and in what way education could benefit from using a virtual world. The fourth chapter will explain what Active Worlds is, this is a virtual world in which we build our concept. Chapter five discusses in what way collaboration is possible in Active Worlds. In the sixth chapter we will discuss the use of Active Worlds for educational purposes. Chapter seven will give the outcomes of a

questionnaire we handed out to students of the major Information Services. The eight chapter will give an insight in the process of building the Hanze world in Active Worlds. Chapter nine discusses the technical aspects of both Active Worlds and Second Life, to give a comparison between these two worlds. All of this is meant to give a good advice which world would be better suited for educational purposes. The tenth chapter shows the outcomes of the test and evaluation of our virtual world. The final chapter, chapter eleven, contains a conclusion about the research we have done.



Projectgroup Virtual Worlds:

Ronald Boekhoudt

Cécile Houkes

Jochem Koens

Vilija Naruskevici (not on picture)

Casper Reininga

Arie Schenk

Kim Ziengs

## 2 VIRTUAL WORLDS

This chapter will give some basic information about virtual worlds. What are virtual worlds and how did they develop? We will mention why they have been created and how virtual worlds work. In this chapter we will also explain what Second Life and Active Worlds is.

### 2.1 What are Virtual Worlds?

A Virtual World is an online community which operates in a 3D graphical environment. Virtual worlds can be divided into two basic categories: gaming and non-gaming. It is a simulated world which users can access through an online interface. A virtual world is basically a digital version of our own world. In a virtual world users can create their own online character, called an avatar, and meet other people. People can share their interests and ideas about a lot of different subjects.<sup>1</sup> Virtual Worlds are also known as Multi User Virtual Environments (MUVE's).<sup>2</sup> Examples of MUVE's are Second Life and Active Worlds. We will discuss these two worlds later on in this report.

### 2.2 How did virtual worlds develop?

In the early 1970's NASA developed the game 'Maze War'. This game can be seen as the origin of virtual worlds. The game introduced eyeballs as avatars, they had maps showing the game levels and it was one of the first games that was played on networked computers.

In 1986 LucasFilm Games developed Habitat. This was a two-dimensional environment that worked with humanlike avatars. People could access the game through the online service Quantum Link on their Commodore 64 computers.

In the 1990's the world wide web started to rise and virtual worlds were getting more and more popular. The Active Worlds platform allowed people to join for free or pay a monthly fee for premium features. Most of the early virtual worlds disappeared because the hardware and bandwidth requirements were too strict. Besides that, they never were able to establish a hardcore user base.<sup>3</sup>

### 2.3 Why have virtual worlds been created?

Virtual worlds have been created for different reasons. For example for games, users can play certain games online against opponents from all over the world. But virtual worlds are also developed to socialise, users can join communities with people that have the same interests as them. These worlds are called social worlds. There are also worlds that are developed for educational purposes. The link between virtual worlds and education

will be further explained in the next chapter. Another kind of virtual worlds are the political worlds. In these worlds users can express their opinions and debate with each other about their ideas.

#### **2.4 How does a virtual world work?**

A user enters the world via a personal computer which runs special software that connects to one or more servers, which passes information back and forth between users over the internet. The virtual world simulates three-dimensional environments which are filled with virtual objects. The user can walk, swim and fly through this environment. Next to that, there is the possibility to interact with thousands of other users.

#### **2.5 Is it just one virtual world or are there more?**

There isn't just one virtual world on the internet, in fact there are hundreds of worlds. These worlds are not the same, but they have a couple of things in common. As we mentioned before, it is possible for multiple users to enter the world. All worlds have graphical user interfaces, this means that the environment looks real compared to the real world. The time in the virtual worlds is also the same, interaction takes place in real time. Every world is also very interactive, users can not only talk to one another, they can also change the environment of the world. Users can build and develop certain objects and they can add customized content to the world. Another thing the worlds have in common is that they keep existing and that they will continue after a user has logged out, similar to the real world which also doesn't stop when you are sleeping. The last thing virtual worlds have in common is that users can form groups, they can socialise with each other and form communities.<sup>4</sup>

Examples of virtual worlds are:

- Second Life
- Active Worlds
- Virtual Magic Kingdom
- The Sims online
- Habbo Hotel
- Cybertown
- Coke Studios
- Worlds of Warcraft

As mentioned earlier we will discuss and compare Second Life and Active Worlds.

#### **2.6 What is Second Life?**

Second Life is a large online community which was created in 2003 by Linden Lab. It is a commercial virtual world and already has millions of active users from all around the

world. At this moment Second Life is the biggest and most popular virtual world. The virtual world in Second Life consists of islands which all have a different theme and owner. The world in Second Life is entirely created by the users.<sup>5</sup>

Multiple companies and even the government use Second Life. They build their own virtual buildings to provide information about the company or political party to the users. For example, the ABN AMRO bank has a place in Second Life where it provides users with information about their banking issues in a virtual ABN AMRO building.

A virtual world like Second Life is interesting for companies, because a lot of people already use a Second Life. It is an easy way to advertise and reach a large group of people. The number of people that use Second Life are still increasing. Advertisement in Second Life is much similar to the real world, companies can make large billboards and place them on the online streets. It is also possible for companies to build their own building in Second Life with for example an information centre with information about the company.

### **2.7 What is Active Worlds (Surfnet)?**

Surfnet is developing innovative educational IT software, especially for schools. There is a pilot running in cooperation with Active Worlds. Surfnet provides free access to the virtual worlds of Active Worlds. Active Worlds was launched in 1995.<sup>6</sup> Active Worlds Educational Universe is a world for exploring the educational applications of the Active Worlds Technologie. By making the Active Worlds technology available to schools, teachers and students at lower costs, they hope that educators will be able to come up with new concepts and learning theories. The idea behind it is to improve the educational system by using virtual worlds.<sup>7</sup> In Active Worlds members can meet each other. Active Worlds has members all over the world and it has the worlds number one 3D chatbox. Users of Active Worlds can build whatever they feel like building, they can do this by using a database with thousands of 3D-objects which are available for free.<sup>8</sup> Students have free access so they can find out if it is useful for educational purposes. Students can build structures in Active Worlds and for example organise meetings. Every user also creates their own avatar.<sup>9</sup>

### 3 COLLABORATION

Collaboration means working together, that is the essence in this term. Collaboration applications are created to improve the collaboration between two or more working forces like, employees, divisions and organisations.

An important characteristic of collaboration is that collaboration takes place with a common goal. To achieve this goal it's very important to have good communication with each other. The aim of this communication is knowledge sharing.

Ideally a collaboration team would consist of people from all kinds of departments in a company if the team is set up to work on a project for a company; this is to get different kinds of working experience together in one team and to provide more ways of looking at a specific problem.

A collaboration team could also be set up to provide answers to certain questions in a specific area of expertise (much like a community of practice).

Some definitions:

'The process by which people/organizations work together to accomplish a common mission' 10

'The idea of employees working together in a joint intellectual effort. This is usually achieved by using tools that allows the employees to share information dynamically between one another to boost performance and productivity' 11

Collaboration in the context of student group work contains several meanings. This means sharing knowledge and information, brainstorming together finding new solutions, creating new knowledge. Another important aspect of collaboration is achieving results Together with a group of people. Without an effective communication, quality collaboration is not possible. Collaboration is supposed to be the reason of the better final results. Working alone is not so beneficial as working with a group.

A big advantage of collaboration is the amount of knowledge in a group. Two or more people always know more than one. Sharing knowledge creates the possibility to increase your own knowledge and improve it as well. Working together is not only better for the final result but also for your own result because you can learn a lot from the other group members.

Collaboration is also very important for developing social skills. During collaboration, people not only learn how to combine the work of other people, they also learn how to deal with the social part of their group members. This is very important for a fine collaboration. Without understanding or respecting each other, the collaboration will end very quickly.

There are of course negative things about collaboration as well, for example the fact that you can't rely on everybody about motivation and finish work before the deadline ends. This is also a reason why it's very important to have a lot of contact with each other to be sure everybody is enough involved with the project. But in my opinion collaboration is very useful to get a better result in the end and to learn more than working alone.

The present web 2.0 (and 3.0) developments have a lot of influence on collaboration. Think for example at Blackboard. This piece of programming made working at distance a lot easier thanks to document sharing and discussion boards. Web 3.0 developments can also make other group processes digital, like discussions and meetings.

## 4 VIRTUAL WORLDS AND EDUCATION

Learning in a virtual world not only connects to the experience of young people which makes it more attractive and also more effective. Besides that, virtual worlds fit well with a constructive vision of learning. The student is assumed to take up an active role when it comes to the processing of information and the acquisition of knowledge and skills. An active approach to learning has a positive effect on the development of social skills, one's notion of responsibility, decision making skills, and also improve the students ability to learn. If applied the correct way, virtual worlds can be used for different ways of learning. Illustrative forms are participative learning and entrepreneurial learning.<sup>12</sup> Virtual worlds will be a part of the future and are already a part of the present. Schools like Fontys, InHolland and TU Delft already have islands in Second Life, where students can communicate and collaborate with each other. Even young people, between the age of 12 and 18, spend a lot of time inside virtual worlds like Habbo Hotel and learn while they are playing. These young people will be the next generation of students who have grown up with virtual worlds.<sup>13</sup>

### 4.1 Virtual worlds as an educational tool

Educational virtual worlds give teachers unique opportunities in teaching their students. Within a virtual world educational facilities are able to create a safe environment in which their students can communicate with one another, exchange ideas, work together on a project, practice their skills and try new ideas.<sup>14</sup> The educational institutes have to deal with a generation of young people who have grown up with computers, the internet and virtual worlds. Therefore, learning inside a virtual world matches well with the experience of students and makes education more attractive. For schools this is very important in the next few years, because they have to compete with other schools to keep enough students at their school.

By working with virtual worlds as an educational tool, online teaching methods are advancing.<sup>15</sup> This is why virtual worlds can function as a tool within various educational forms. Linden Lab, the founders of Second Life, are playing a great part in encouraging teachers to use a virtual environment for educational purposes. Linden Lab shows teachers the advantages in using a virtual world by starting a mailing list about the subject in 2005 for teachers who are interested in using a virtual world as an educational tool. Within a year this mailing list had more than 700 interested teachers around the world. This shows that teachers see the potentials of a virtual world for educational purposes. Linden Lab offers private Islands to teachers at lower costs for building there own educational environment. Linden Lab gives teachers who are interested and who

want to test Second Life for a class that they are teaching a piece of land for free for the duration of the class<sup>16</sup>.

Another virtual world that is highly suited for educational purposes is 'The Active Worlds Educational Universe' (AWEDU) which was launched by Active Worlds Inc. This is a educational community in which students, teachers and educational institutions can use the Active Worlds technologies at lower costs to build their own educational environments. By using AWEDU, Active Worlds Inc. hopes, it is possible for teachers and students to explore the use of Active Worlds as an educational tool in which they can invent new kinds of learning theories and methods.<sup>17</sup>

More and more teachers are acknowledging the fact that virtual worlds are upcoming. They realise that virtual worlds are or going to be a part of the way they teach their students now and in the future. By realising that virtual worlds are, or going to be a part of the future of education, teachers are aware of the fact that learning more about this way of teaching is also important to improve their own professional skills. They have to keep up with the needs of their students. It gives teachers the opportunity to improve their way of teaching and on the other hand it improve the learning abilities of students.<sup>18</sup>

#### **4.2 Pro's and cons of virtual worlds for educational purposes**

A virtual world used for educational purposes has a lot of future potential. Using a virtual worlds for educational purposes has the following advantages, mentioned in the table below.

<b>Pro's</b>	<b>Explanation</b>
<b>Distance learning</b>	Using a virtual world as an educational tool is ideal when it comes to distance learning. <sup>19</sup> By using a virtual world, boundaries will disappear and it will limit the distance between students, even when the students are from different countries. In a virtual world time and place aren't an issue. Therefore a virtual world makes education more accessible for students that live far from the school. It is possible for someone from the Netherlands to take a course of a school in for example America, without leaving the country. Using a virtual world for educational purposes makes boundaries disappear and different cultures can meet a lot easier than before, but not in real life, but as an avatar. They don't have to travel a thousands miles to follow courses in another country. <sup>20</sup> Giving classes in a virtual world

	gives students that sometimes live far apart, the feeling that they are actually together at school. <sup>21</sup>
<b>Flexibility</b>	An advantage of a virtual world as an educational tool is flexibility. The environment is easily adaptable to serve specific needs. Unlike the real world, virtual worlds give room to an experience with stretches the boundaries of reality and imagination: you can fly, explore and create buildings of your own design. You can meet strangers and simply vanish when you don't like them and you can dance with people, who are from all over the world. Limitless experimentation is possible and only in the worst case is punishable by the removal of your account. <sup>22/23</sup>
<b>Collaboration</b>	In a virtual world, students learn by doing. This is called participative learning. They can work together on a project online. By using voice chat it is possible to 'really' talk to each other like in real life, but then only through an avatar. <sup>24</sup> It also stimulates the motivation of students and the forming of groups. <sup>25</sup> A virtual world offers the ability to save information and work on it as a group.
<b>Social interaction/ communication</b>	Virtual worlds can help with social interaction between students and between students and teachers. Communication in a virtual world stimulates creativity and the imagination of students and teachers. Students that work in a virtual world feel more free to express their opinions, more than in real classes because they are in their own comfort zone. <sup>26</sup>
<b>Meets expectations</b>	A virtual world as a learning environment meets the expectations of the new generation of students which have grown up with computers, the internet and virtual worlds. Research confirms that ICT, like working with computers and the internet, are an integral part of the daily activities of young people. The youth learns by doing, they are social and result-orientated. <sup>27</sup> Virtual worlds are a lot richer, more interactive and more exciting than regular classes. <sup>28</sup>
<b>Creativity</b>	The creativity of students plays a big part in educational virtual worlds. Students are stimulated to use their imagination inside a virtual world, they are the ones that have to communicate with one another. A student has to be creative to fill in his own special needs for education. <sup>29</sup>

There are also cons to using a virtual world for education purposes. They will be mentioned in the table below.

<b>Cons</b>	<b>Explanation</b>
<b>Depended on computers</b>	For using a virtual world students and teachers need a suitable computer with internet connection. If for some reason students don't have a computer at home or the internet connection fails, it will be impossible to reach that student.
<b>Identity of student</b>	In a virtual world, it is hard to check the identity of the student. It is hard to define if the student is who he says he is. It could be as well be an older brother.
<b>Exams</b>	Taking exams in a virtual world is also not a good idea. Students are in their own home and have access to internet and books to look up the answers to the exam.
<b>Participating students</b>	When a teacher is giving a lecture, it is hard to determine if the students are really paying attention or even if they are actually behind their computer.

#### **4.3 Application of an educational virtual world**

By doing research on this subject we learned that virtual worlds have a unique added value when it comes to valid, experience-based and experimental learning and it helps with developing system thinking. These terms connect very well with the learning objectives of higher education. The application of a virtual world in higher education is however difficult. There is a large diversity in institutions fields and learning aims, the requirements and expectations of students and teachers are also very high and differ a lot between studies. Besides that, institutions for higher education do not have the knowledge or the resources for further distribution of interesting virtual worlds for their institutions. The solution to this problem cannot be found in already made virtual worlds in higher education and neither in expensive measured solutions. A better idea is to give teachers, students and institutions the arranged tools to do it their selves. There is therefore a need for flexible and modular build virtual worlds in which teachers, students and simulation developers can create and implement new game simulations for several learning aims and institutions. A program which is very well suited for these purposes is Active Worlds. The developed games and game simulations can be exchanged in a library, so that others can re-use them or develop the game even further. The teacher keeps control over his own educational program and decides when and how the game is played. It is easy and flexible are already to be recognised in virtual worlds like Active Worlds and Second Life.

## 5 ACTIVE WORLDS

Active Worlds (AW) is a 3D virtual reality platform which lets you visit and chat in 3D worlds that are built by other users. In 1995 Active Worlds was developed by Ron Britvich under the name AlphaWorld. One year later it was renamed Active Worlds. Active Worlds starts as a public universe where users can create their own world in which they can build. With this, it was one of the first products in it's kind. In 1997 the Uniserver concept was introduced. Companies and institutions can create and control their own universe, apart from the public universe.<sup>30</sup>

In 2006, the vision of Active Worlds is:

"We serve what we believe is an emerging market for three-dimensional Internet interactive technologies and applications. We host hundreds of virtual worlds. In addition to our own worlds, we have been engaged by other companies to develop worlds for them, and we have granted them a license for our technology. We have also licensed our technology to clients who create their own worlds." (Activeworlds Inc, 2006). 27

### 5.1 How does it work?

The different public universes are free to access. Guests are called tourists, paying users are called citizens. The most used public universes are Active Worlds, Active Worlds Europe, AWEDU and L3Daw. The universes of Active Worlds and Active Worlds Europe are not accessible for free users in some cases. And just like in Second Life, building in Active Worlds is only possible if the owner of the world gives you the rights to build. To own a world in one of the mentioned public universes is not for free, but to own a world gives the owner the right to decide if there is a distinction between free and paying users.

If you are a guest in a public accessible Active Worlds universe, registration is not required. You can choose a guest name and fill in your e-mail address to access a universe. A paying user can register with his or her credit card at the administrator. These paying users of public accessible universes have more extra possibilities they can use. For example communication and avatar choice.

Before a user can enter a universe, they need to download and install the Active Worlds software. The four mentioned public universes, all have their own implementations of the Active Worlds client software. As a result of this, a user has to download and install different applications for the use of these universes.<sup>27</sup>

## 6 ACTIVE WORLDS AND COLLABORATION

Virtual Worlds support communication and collaboration in a place-like context. "They're very well suited for collaborative work," Caleb Booker, writer and blogger explained: "We're not sure why yet, but there's something about seeing everybody's avatar in the room with yours that makes the whole experience far more effective than if you were to simply have a conference call. It creates a real shared experience." 31

Why are virtual worlds so different from computer games? According to Castronova (2005), virtual worlds have three features:

They keep existing: even when a user logs out, and returns after day's or months.

They are physically consistent: there are physical laws which determine cause and effect relations and gravity. These laws make the rules and boundaries for physical activities like running, building and fighting.

They are interactive: they have many different possibilities for communication. Not only text (chat) but also image en speech. An avatar has many possibilities for non-verbal communication like dancing, laughing, waving and whistle.

Virtual worlds are very advanced for interhuman communication. They offer the same possibilities as other communication media like telephone, chat and video. But they also add two important aspects. First of all the possibility to come up with new rules for interaction en second to implement and experience what it's like to live in a virtual world.32

### 6.1 Collaboration in Virtual Worlds

Virtual collaboration means the same as ,normal' collaboration, but communication part during the work process is special. Communication in this case means not face to face but on-line way.

Tools of virtual collaboration are various: from e-mails and wikis to integrated tools of video and audio conferences, instant messages, group chats. Virtual collaboration tools should let people have conversations (on-line as well as off line messaging), see common material, hear, experience, easily and without misunderstandings let edit, change and add, keep logs of actions (sort of minutes of meetings). Most important that it can happen in a real time with many people all around the world.

### 6.2 Collaboration in Active Worlds

In Active Worlds the possibilities for collaboration are limited by technical boundaries. Some things are possible though. Everybody who enters the Active World, are represented by avatars. Chatting is possible in writing and speech. The writing chat can

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also be limited to one area in the world. This means that only the ones in that room or area can read the chat. Everybody outside that area can't read what is said inside the restricted area. This is not yet possible with the voice chat.

## 7 ACTIVE WORLDS AND EDUCATION

Over 4 years now Active Worlds is active with adding new dimensions to learning. Active Worlds.Inc started up The Active Worlds Education Universe (AWEDU). Active Worlds.Inc has over 80 educational worlds available in AWEDU, and added to that there are a number o educational worlds in the main Active World Universe where classes are taught, experiments are performed and meetings are held.

Educational virtual worlds promote an interactive style of learning, opportunities for collaboration, and meaningful engagement across time and space, both within and across classrooms. (Riner, 1996).

### 7.1 Active Worlds Education University (AWEDU)

Active Worlds™ is one of the oldest and most dynamic 3D virtual world applications online today. The client-server application consists of the Active Worlds universe with hundreds of individual worlds for users to explore and to communicate with other users worldwide. Active Worlds is unique because it provides the option of creating user-extensible worlds in which users can add to and build in existing worlds.

In 1999, the owners of Active Worlds created the Active Worlds Educational Universe (AWEDU), a universe devoted solely to education initiatives. The AWEDU is an educational universe with nearly one hundred individually owned, created, and maintained educational worlds. The Active Worlds Educational Universe also affords user-extensible provisions and support for building new worlds and adding to existing worlds. Educators registered as world owners are provided with a library of customizable objects from which to define and build their world.

### 7.2 Interface

The AWEDU browser interface is comprised of four main windows. The center and most visually prominent window is the 3D world view in which users interact with other users and the environment and navigate through a world. Beneath the 3D window is a chat dialogue box for communication. On the left of the browser is a tabbed window that allows users to choose from a variety of extra functions for navigation, communication, and help options. To the right is an integrated web browser that allows users to interact both within the 3D environment and with web pages.

Within the AWEDU environment, users are represented by both their self-selected unique identity (i.e., alias or nickname) and by their avatar. An avatar serves as the visual representation of users currently inhabiting a particular world. Upon entering a world,

users may select from a library of avatars offered by that world. Avatars serve not only as the visual representation of a user, but also as the "camera" or viewpoint into the 3D environment.

### **7.3 Requirements**

AWEDU requires a computer with a 200 MHz Pentium processor, 64MB RAM, Microsoft Windows (95, 98, Me, NT4, 2000, or XP), and DirectX 3.0. The AWEDU browser and servers can be downloaded from the Active Worlds web site (<http://www.activeworlds.com>). The AWEDU browser supports the following languages: Spanish, Danish, English, Dutch, French, German, Finnish, Italian, Hungarian, Norwegian, Portuguese, and Swedish. Despite language support, however, some of the browser features remain in English. English is also the primary language used for documentation.

### **7.4 Environment**

The Active Worlds Educational Universe offers much potential as a resource to extend the traditional classroom setting and as a medium for distance education. The AWEDU environment is restricted to educational initiatives and provides resources to enable even novices in 3D development the ability to quickly construct and customize a 3D virtual world. Owners have access to libraries of hundreds of objects ranging from building items such as walls, floors, and doors to household objects such as tables, chairs, and beds from which to select and customize. Owners can easily add interactive opportunities within the 3D environment by animating objects and textures and by designating sensors that trigger actions and events both within the 3D environment and by activating the integrated web-browser. Additionally world owners may also select from a pool of existing avatars to provide for users visiting their world.

World owners have options of both creating and limiting access to their world, thereby insuring privacy and security in the learning environment. Within the 3D environment they can assign or deny building privileges as well.

### **7.5 Communication**

Upon entering the AWEDU universe, users may self-select a unique identity. No other user within the universe may use this identity. A unique identity helps establish both trust and accountability. Communication within the AWEDU environment is limited to text-chat. Upon first speaking or chatting within a world, a user's name appears above his/her avatar's head. This allows users to recognize one another in the 3D environment. Chat appears both in the text-dialogue box located beneath the 3D window, and it also appears above a user's avatar in the 3D window. Users may also establish contact lists of other users. A contact list allows users to find and communicate with each other in various worlds. Users also have the option of whispering to one another if their avatars

are in close proximity or they may choose to send a telegram to another user who is visiting another world.

### **7.6 Representation**

As previously stated, users are represented in the 3D environment in the form of an avatar. Users can control their avatar to move through the 3D environment by moving along both the X and Z axis (walking and sliding). Additionally avatars can be moved along the Y axis by flying and ascending. The user may also designate looking up and down, and side to side by using key commands. Users have the choice of toggling between perspectives by viewing the environment from first-person (through the eyes of their avatar) and from third-person (orthographic). When an avatar encounters a solid object (e.g. a wall of a building) the avatar will register a slight impact and be prevented from moving through the wall. World owners and builders may also adorn the environment with sensors and triggers. A user's avatar encountering a sensor or trigger, may activate a variety of pre-specified actions such as being transported to a new location or world, activating a sound file and animation or even activating a webpage to load in the integrated web-browser.

### **7.7 Educational Implications**

Learners are embodied in the 3D environment in the form of an avatar which allows them to interact with the environment and with each other. In keeping with the current focus on inclusion and diversity in the learning environment, it is important to address how any educational medium supports or inhibits inclusion and diversity of the participants particularly in collaborative learning environments. With regards to diversity, AWEDU is problematic in the ways the design limits users ability to control representation (Dickey, 2002).

One area that deserves closer scrutiny is how AWEDU might be intended for use. This may not be suitable as the primary medium for a lecture/discussion style class. Differences in typing skills may disadvantage some students. Additionally, differences in written language skills might also serve as an impediment for other students. Granted in a traditional classroom, differences in communication skills advantage some students over others, however, a traditional classroom also offers a wider range of avenues for non-verbal communication. Although there is indication that AWEDU does offer a degree of embodiment within the design, it does not allow for the variety and complexity of non-verbal communication as is available in a face-to-face setting.

There are already many educational initiatives within the AWEDU universe ranging from informal training for new users, to using AWEDU as a distance education medium for

university level courses (Dickey, 2000). The flexibility afforded by AWEDU makes it suitable for a variety of subjects including foreign/second languages, science, communication, language arts, as well as many others.

While it is important to address weakness in such areas as diversity and inclusion, it is important to note that AWEDU is an emerging technology and in a constant state of revision. Informing designers of the weaknesses is part of the process of insuring that emerging technologies include the type of design features that support the needs of all learners. 33

## 8 WHAT DO STUDENTS WANT?

We asked 15 persons of the IDV4A class to fill in a questionnaire about their use and ideas of virtual worlds.

Only 7 persons from the 15 questioned students had already visited a virtual world. This group consists out of inactive users because they all spend less than one hour every week on visiting virtual worlds. Second life is the most popular program. No students were using other tools like ActiveWorlds or There, Habbo, etc.

ActiveWorlds only runs on computers with a Windows system. That is why there is a question about the operating system in the questionnaire. One third of the questioned students are using a Macintosh operating system. The rest is using Windows.

50% of the students are skeptic about using a virtual world for collaboration, because they prefer to work with people in real-life. Other arguments against virtual worlds are: It runs too slow on a computer, because of the graphical demands, the user friendliness of a virtual world is too low.

The only advantage for non-skeptic students is less traveling.

We gave some options in the questionnaire of what kind of techniques the students would like to use in a virtual world. The most popular techniques that students want to see are; brainstorming, discussion possibilities, the possibility to contact other groups and virtual coach meetings. These answers suggest that students are willing to do social activities in a virtual world. This is also what 50% says in the question of what they want to do with a virtual world.

We can conclude that many people are still remarkable sceptic about using a virtual world. The fear of these people is to lose the social part of working together, because they still prefer to work in real life rather than using a virtual world to collaborate.

The questioned people who didn't preferred to work in a virtual life answered relatively positive to social activities in virtual worlds. We think that they don't want to see a virtual world as a replacement for real life, but are willing to use it as an addition to their work (as a replacement for msn).

Almost every questioned student answered positive to the social possibilities with a virtual world can offer. This implicates that they are open to it, and are willing to at least

try to use a virtual world. Also the population of Second Life is still growing and we think that coming years people are willing to use a virtual world more and more.

The reactions about chatting and sharing within a virtual world where answered remarkable positive. All in all we can conclude that many people are a bit sceptic about using virtual worlds, but the majority of the questioned students is willing to try.

## 9. BUILDING PROCESS (concept)

To come up with ideas of what should be in the Hanze world of Active Worlds, we had several brainstormsessions. In this chapter we wrote what the outcomes of these sessions were and what ideas eventually were implemented in the world.

### 9.1 First draft concept of the Hanze educational virtual world

#### The concept

The idea is to build four main areas in Active Worlds. An information centre, a project room, a common room and a library.

#### Information centre

The information centre is the place where all people land when they start up the Hanze universe. From this certain point persons can orientate themselves and start using the virtual world. Our information center contains the following functions:

- Manual - instructions how to use this educational work environment
- Buttons for teleporting to different places in educational world
- A sign with list of the rooms, people, who are working there at the moment and information about the project they are working on
- Announcement board – for adverts, ideas, internships etc.
- Available rooms
- Chat bots (still working on the idea if there will be may small ones or just one). These chat bots can answer the questions of the users
- Blackboard link
- Map of the educational world
- Language choice(English, Dutch)

#### Project room

The project room is an area where group members can meet and work together. This is not a room like we have in the reality. It is a floating platform in the sky. There are two possibilities to get into a project room:

- Go to the information centre to check if there is a project room available
- Create a project room for your assigned project team

This room should have 'video game loading structure' which means, by leaving the project room, the work will be saved and available when they return to their project room.

Other functions for the project room would be voice chat, multifunctional screens (for brainstorming results, videos, powerpoint presentations and mind mapping) and a menu.

The menu is devoted to groups and contains a set of useful tools:

- Brainstorm software
- Mind mapping
- Creating and viewing power point
- Editing documents
- Reading documents
- Creating documents
- View video
- Agenda (for existing meeting and for next one)
- Sending memo to other groups in the world
- Social activities(braintasers, team builders)
- Option for time limits(no longer that 45 min, 1 hour o so)
- Deadlines list
- Calendar
- File catalogue (files of the group)

### Common room

The common room can actually be called an event room as well. The aim is; to become a gathering place for big events, large classes, meetings, lessons, conferences, videos, presentations and workshops. This room is similar to a project room and has the same control menu, the difference is that the room is much bigger and public.

### Library

The library contains information like: research papers, links to magazines, newspapers, commercial databases, thesis reports, internship reports and report templates. The most important functions are the search and send function (when you find a file you can send it by mail directly to your colleague or put it in your project group file exchange). All the projects made in the educational world will be saved in a project database and will be accessible for the visitors. The library will also be accessible through the chat bot (ask a question and the chat bot will list information and material)

### Additional ideas

- There should be a print function available in the virtual world.
- Every user in the virtual world could create his/her own profile consisting of a picture, role in the group, strengths and weaknesses in working, previous

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experience with projects or in general. By using this profile, team members will get to know each other better. This can be very useful information for dividing the tasks.

- There should be a log function possible for saving the conversations during the meetings.
- File sharing possibility
- Closed chat function
- Building and constructing possibility

## **9.2 New ideas and improvements of the draft of the concept**

After doing more research, our team decided to make some changes in the concept of the virtual world what we have created.

1. The project rooms in ActiveWorlds are meant to be for student constituent and teacher collaboration.
2. The socializing area will be added to our virtual world. We came up with the idea after exploring and experiencing ActiveWorlds of other universities. A socializing area might help to make the world more attractive and interactive for students and teachers without boundaries.
3. It is still not clear how the social area will look like in ActiveWorlds. One of the ideas is to build a lounge.
4. Our team decided to divide the Hanze Universe in two different areas; air and ground. The ground will be used for experiencing, exploring and socializing. All the project rooms will be located in the air, so there will be clear division into work and social areas.
5. The common room was split into two areas: the lecture room and the common room. The Lecture room is a spacious room meant for large classes. Our team thought that voice chat function in this room has to be able only for the main speaker or speakers. The common room is a park-like area for socializing and Hanze events. The lecture room and the common room will be located on the ground, because during the breaks it is easier to go and explore the ground and meet people.
6. The conference room is a new idea. Instead of making a common room for all kinds of classes, conferences and lectures, we decided to build a conference room (meeting room) for official meetings. This room will be part of the library.
7. Information about various countries. Our faculty is highly concerned in building intercultural competences, therefore an idea of building information path about different countries and cultures was developed. First of all we will concentrate on describing habits of working in various countries, which might help to international teams to understand each other better and achieve higher results.

8. Fun activities and socializing area. In our first concept we decided that we want to create a fun activity area for project groups where they can socialize, discuss and solve problems not related to projects. This might be used as a break during their work. We came up with an idea of the forest. This 'relax zone' is a forest containing quotes and small games. So project groups can meet, have discussions and solve brain-teasers.
9. A familiar environment instead of unique buildings. Our team made a desk research and listened to some guest speakers about the style of architecture in virtual worlds. First we decided to build something extremely new and innovative, but we realized that people feel more safe and familiar with an architecture environment where they live in real world. As a consequence, our world will consist of objects which can be found in the real world too. The second reason why we pay so much attention to the environment is, students are very curious and people in general like to be in nice surroundings. The design of a virtual environment should help to keep students interested and encourage them coming and working there.
10. Usage of the library.
  - a. We discovered that the library in the virtual world similar as in a real world can be used for exhibitions. These exhibitions of videos, photos and drawings can be organized by students of the Communication faculty or enthusiasts around the world. This area will be devoted for publishing all kinds of art created by students. A lot of videos, photos magazine and poster designs are created by ICV students because it is a part of the program. This space could be used for publishing finished and graded assignments.
  - b. After visiting virtual libraries, we noticed that a receptionist would be very useful, so we created an area in our library for a librarian who can help people with finding information and teaching him/her how to use this library. One of the staff members in our library could work virtually in the future.
  - c. We decided to create a lounge room in the library too. This area is for socializing, advertising and searching for all kinds of information (in on-line databases, journals and etc.). The lounge room can become an additional place for exhibitions. Hanze University Groningen can place there advertisement and commercials of their sponsors in a lounge room.
  - d. In active worlds we can listen to sounds, for instance water, but overall, this world is silent. Music would be nice, but it is inconvenient while having

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voice chats. The library lounge room can become a place where visitors could listen to music and use only text chat.

### **9.3 Final concept of the product: what we've got**

Not everything what was planned in our concept was possible to implement. The main reasons are technical limitations of active worlds and resources (like material for the library) and lack of skills and experience in building a virtual world. Many functions which we thought of could not be implemented in the project and therefore it could not be tested. The final world consists of an information centre, project rooms, common room, lecture room, library and fun activities zone.

#### Information centre

The information centre is a park of information with several points to stop. All visitors land in the 'information point' where the basic information about the world is displayed: to whom this world belongs to and what to do next. From this certain point, visitors can orientate themselves. First of all we suggest for new comers to follow the trails of information. The information center is divided into:

1. Welcome center
2. Information about the project and teleporting centre. Here can visitors find descriptions of the main areas in this world and teleport there.
3. Photo gallery of current events in universe
4. Announcement centre for adverts, ideas, internships and important university news.

#### Project room

The project room is a area where group members can work together. This room is meant for student-student, student-teacher, teacher-teacher collaboration. The project room is floating in the sky and has a closed chat function, which means that nobody else can participate in the chat of group members. Project groups can teleport to an available project room and work there.

A project room has a table with chairs, a video screen, information boards (which has to be transformed in 'how to use this room' manual), announcements board, file exchange locker and a mail box. Visitors have to log in to blackboard before coming to the Hanze world. Then they will be able to use file exchange, announcements and mail box functions in a project room.

### Common room

The common room is build next to a big lecture room. The common room and the information park are meant for meeting people and socializing. The area is big, so during the events there will be space for everybody.

### Lecture room

The aim of this room is to provide an environment for lessons, conferences, video streaming, presentations, and workshops. Still there are some technical problems with showing presentations on screen because they have to be converted into a special format. The lecture room also has a closed chat function as in the project room. It is a large area with two spacious chairs, where event participants are advised to stay in order to see what is happening on the stage. The lecture room has a bigger screen than in a project room, so more people can see what is being shown.

### Library

The library consists of several areas:

1. information acces point
2. conference room or meeting room
3. lounge room

The information access point is a place where visitors arrive after teleporting to library. Here they can find the information desk, but it is not working. We also do not have any material to put in library resources and librarian or an employee who would help people.

The conference or meeting room is another area in the Hanze Universe where groups of people can gather and have small official events.

The lounge room is an area for socializing, advertising and searching for all kinds of information (in on-line databases, journals and ect.). The lounge room is an additional place for exhibitions. The Hanze University Groningen can use this area for advertisements and commercials of its sponsors.

### Fun activities zone

The virtual world is also taking care of entertaining students. The idea was to implement a forest with quotes, small games and brainteasers. Social and fun activities areas help new users to get acquainted with how everything works in virtual worlds.

### Conclusions: findings

While working on this project we found out several things about creating and working with virtual worlds.

1. The Virtual world constantly has to be administrated. Every time when a new event is taking place in a world (like our organized lecture)an administrator has to put some new signs and information. Virtual worlds must be modified all the time to stay interesting and attractive to the users.
2. The Hanze university Groningen could use a virtual world for advertising. It can be both: advertising the school and advertising companies, services or products within the Hanze world. This could help financing this virtual educational world project.
3. Graphic and technical possibilities of active worlds are quite poor. Second life has an advantage in these areas. Moreover, second life has more traffic and this is helpful if university wants to organize on-line events.
4. There are 2 styles of virtual world's architecture. First one is copying real life and all buildings and objects looks like a copy from a real life. A big disadvantage of this kind of architecture is inconvenience to move around the virtual world. It is not really user-friendly buildings. On the other hand, people feel more comfortable and find it easier to orientate them in a virtual world which is so familiar to a real one.

The second style is taking into consideration the fact that objects have to be convenient to use. Builders in favour of the second style often gives an example that in virtual world it is not cold and it never rains, so why do we need roofs and doors. The second style is more creative and suggesting to use advantages of the virtual world in building not ordinary objects and buildings.

## 10 TECHNICAL ASPECTS

In this chapter we will discuss the technical aspects of a virtual world. We will mention the system requirements for using a virtual world and if students can easily use it. Beside that we are discussing what world is better suited for educational purposes, Second Life or Active Worlds. At the end of this chapter we will mention the technical limitations we ran into while working on our world.

### 10.1 What are the system requirements for using a virtual world?

The system requirements are different for every virtual world, since you are using a different piece of client software for each of the worlds.

If we take a look at the worlds we are using for our research and our concepts (Active Worlds and Second Life) you can see that the worlds look quite different and if we take a look under the hood we can see that Second Life requires a lot more from your system than Active Worlds.

Listed below are the system requirements for Active Worlds and Second Life (assuming you run a version of Microsoft Windows): (1&2)

Active Worlds Minimum:

- Pentium II CPU 300Mhz or equivalent
- 64MB RAM Memory
- Microsoft Windows (98, Me, NT4, 2000, or XP)
- DirectX 8.1 or later
- Windows Media Player 6.4 or later
- D3D video card with at least 8MB and the latest drivers

Active Worlds Recommended:

- Pentium IV CPU 800Mhz or better
- 128MB Memory / 256MB Memory for XP
- Microsoft Windows 98, Me, 2000, or XP
- DirectX 8.1 or later
- Windows Media Player 9 or later
- 3D accelerated video card with at least 64MB and the latest drivers

Second Life Minimum:

- Windows 2000, XP, or Vista
- Computer Processor: 800 MHz Pentium III or Athlon, or better

- Computer Memory: 512 MB or more
- Video/Graphics Card for XP/2000:
  - nVidia GeForce 2, GeForce 4 MX or better
  - OR ATI Radeon 8500, 9250 or better
  - OR 945 chipset
- Video/Graphics Card for Vista (requires latest drivers):
  - nVidia GeForce 6600 or better
  - OR ATI Radeon 9500 or better
  - OR 945 chipset

#### Second Life Recommended:

- Windows XP or Vista
- Computer Processor: 1.5 GHz (XP), 2-GHz (Vista) 32-bit (x86) or better
- Computer Memory: 1 GB or more
- Video/Graphics Card:
  - Nvidia Graphics cards (6000 series: 6700, 6800; 7000 series: 7600, 7800, 7900; 8000 series: 8400, 8500, 8600, 8800;
  - GeForce Go: 7400, 7600, 7800, 7900)
  - ATI Graphics Cards (X800, X900; X1400, X1500, X1600, X1700, X1800, X1900)

So basically for proper use of the Active Worlds client you can use any modern pc or laptop or even an older one. For the use of the Second Life client however, you can use some of the older pc's and laptops but it really is advisable to use at least a mid-range (meaning it was new and up-to-date 2 years ago) pc or laptop. If you want to use Second Life to it's maximum potential you should really use a pc or laptop that's meeting all the recommended requirements or better.

#### **10.2 What about students?**

We are taking Active Worlds and Second Life as examples again. The Active Worlds software can be used by all of the students that have their own pc or laptop that can run windows 2000 or windows xp. If they are using an apple notebook they can still use the Active Worlds software by running Windows emulation software like VirtualPC.

The client for Second Life is a lot more demanding on your system, so a lot of student won't be able to use it because their hardware isn't sufficient. This is because most of the student buy their pc or laptop to use it for school, so it needs to run programs like Microsoft office, internet explorer and acrobat reader, these pc's and laptops are a lot cheaper and can be used for up to 5 or 6 years, but are seriously lacking in the power

needed to create the 3d environments that Second Life offers. However most new (meaning bought in the last 2 years) laptops and pc's can probably run the Second Life software at the lowest settings. For some studies students might need a more advanced system because of 3d modelling or for using advanced graphical design software packages, these students won't have a lot of problems running the Second Life software. There are also student, myself included, who like to play video games and have a mid to high-end desktop pc at their disposal (or a so-called gaming laptop) these students won't have much trouble using the Second Life software either.

### **10.3 How much time does it take to get used to the worlds (moving and building)**

Every world contains a beginners area, a place where avatars arrive after their first logon. Active worlds uses a beginners area which is created by one of the administrators of a world and Second life uses special islands called the beginners islands. There are lots of tutorials and other exercises available to learn about the worlds and how to use everything.

#### Active worlds

After the first logon, in both worlds, the avatar will be teleported to a beginners area. There are several signs with instructions about the main controls and how to use them. Within a few minutes, everyone knows the basics about Active Worlds and how to control an avatar.

The basics of building in Active Worlds are also easy. When you want to build a new object, simply copy another object and rename the object. After an enter, the texture of the object will renew into the object you want to. The names of all the objects are stored in several databases on internet where you can easily find them by using a search engine.

Creating new objects is the easy part of the building process. The objects must obviously do something, they must have an action. To make all these actions possible, Active Worlds uses a script. Every object has the possibility to become scripted, you have to add a script into the properties of an object and if it's filled in correctly, the object does what you want it to do, mostly by clicking on it. A simple example of a scripted object; chairs where an avatar physically can sit on, and a more difficult example of scripted objects; closets who are used for file exchange.

In world and on the internet are a lot of tutorials and help files available to help people learn and understand the building process. After building for a while and reading the help files, everyone will be able to build in Active Worlds.

### Second Life

First of all, you have to register yourself on the internet to create an avatar. This avatar looks very basic and you can't change it at that moment. It is meant to enter the world. After you logon with your newly created avatar, you will arrive at the beginners island. This is a place where all the new avatars arrive after their first logon. As soon as you are logged on, there will appear a tutorial screen which tells you about the basic controls and letting you do some exercises to get more familiar with the controls and the game play of Second Life. This tutorial contains also exercises to make your avatar more personal. There are a lot of options available in Second Life to edit your appearance.

Building in Second Life is a little bit more complicated then building in Active Worlds. In Second Life are a lot more possibilities for building and using. It is technically and graphical more developed than Active Worlds so it takes more time to learn building in this world. Second Life also uses scripts for their objects to create actions for it but creating new objects is not simply done by renaming the old object. Most objects in Second Life are not already created, they are created by an avatar. To create objects, you have to put some textures together into a shape. Most of the objects are created in world. It is possible to import .jpeg files to create textures for the objects.

In Second Life are tutorials and note cards available where every avatar can get their experience to build objects. There are also a lot of other characters who are willing to help as well.

But still with the available help, it is not easy to build in Second Life and one other big disadvantage of building is that you have to pay for your building-account otherwise you are not able to build anything.

### **10.4 What kind of world would be better suited for educational purposes?**

Active Worlds or Second Life? At first sight, Second Life seems to be better suited for any purpose (and also for educational purposes) because it is technically and graphical far more developed then Active Worlds. But this advantage could also become a disadvantage because the system requirements are a lot higher then Active Worlds. To run the Second Life software, you need high-speed modern computers with advanced graphical video cards otherwise it is constantly lagging and it won't load all the textures

within a reasonable time limit. Second Life is also very expensive and commercial compared to Active Worlds, so the costs are a lot higher than Active Worlds.

In our opinion, Active Worlds is better suited for educational purposes. The techniques that are necessary for educational purposes are almost all available in Active Worlds, Active Worlds is more easy to use and to install, Active Worlds doesn't need an advanced and modern system like Second Life and it is much cheaper to use.

### **10.5 Technical limitations**

As with everything that has to do with computers virtual worlds also suffer from the technical boundaries of their soft- and hardware. During our research into Active Worlds and Second Life and during the building phase in Active Worlds we were also confronted with the technical limitations of both programs.

Most of the following information is about Active Worlds because we have the ability to build in Active Worlds and all of us had the opportunity to visit it.

This brings us to the most obvious limitation: the hardware, some of the students working on the project just couldn't get Second Life to run because of the quite high hardware requirements.

Another shared limitation between Second Life and Active Worlds is the number of people that can visit a certain place at once. The pilot universe by Surfnet can hold a maximum of 100 visitors at once on a first come first serve basis, so visitor 101 can't enter. One square on the Second Life map is called a sim and can hold a maximum of 50 visitors (when the sim is empty and the visitors are naked, that is;), but 30 is the recommended maximum. However in Second Life it is possible to link more sims on one location to create room for up to a maximum of 255 visitors.

### **10.6 Limitations we ran into while building in Active Worlds.**

These are the most important limitations we ran into while building in Active Worlds:

The area inside the world where one can build is limited; the total building area is 40.000 m<sup>2</sup>. The measurements for the building world are 200x200x200 meters divided into a grid. Every square in the grid is 10x10x10 meters. The building coordinates use the x-, y- and z-axis and basically use the metric system. However for the users of the world the world is divided into 0 to 9 East, West, North and South. So on a straight line from East to West the building world starts at the far edge of 9 East (which equals -100 on the x-axis) and ends at the far edge of 9 West (which equals 100 on the x-axis). The situation on the x-axis is the same on the z-axis, South being the negative and North the positive. The annoying part is that you can't use the x- and y-axis coordinates for, for example, teleporting. You have to use for example 5N(orth) 1E(ast). You can however teleport

further into the grids square by using decimals, so for example 5.56N(orth) 1E(ast). (basically you divide the x and y values by 100 to get the teleport values)

The use of in-world video playing is limited to the file types your own windows media player can handle. This means that if you watch a lot of Japanese anime you will use some not so well known audio or video codec's and you might up using videos only you can play when you are building. Another disadvantage is that you can't use videos from sites like Youtube and Google video because they are embedded into the site and you can't get an url that ends in a file extension (for example .avi or .wmv) instead you will get an url that ends in some random alphanumerical sequence (for example Xa89If16LDE).

Something we found quite frustrating while building was that you can activate a private voice chat with one person, but not with a group. Also it isn't possible to keep voice chatting with someone when either one of you goes to visit another world in the same universe (for example to check on some scripts). It is possible to send each other a so-called telegram when you are in different worlds.

A general sound "problem" is that there is no volume control in the Active Worlds software at all and this causes sounds to interfere with the voice chat and if you turn up your volume to be able to hear others properly you might go deaf from the teleport sounds.

For our ideal concept we want people to work together in our world. But for some of the functionalities we describe in our concept visitors or participants would have to have building rights. This means that they could delete everything because Active Worlds only has two settings for building rights: full or none. 34 35

## 11 TESTING AND EVALUATING

The Hanze world of Active Worlds is finished, now we need to know what the students think of our world. In order to find out what students think, we designed a test case and invited some people to join us in the world.

### 11.1 Test case

After building the first version of the Hanze virtual world in Active Worlds is it necessary to test this environment. This test will give an image of how this virtual environment can and will be used by students. This test will give us an overview of the strong and weak points of the Hanze ActiveWorlds universe. For this test we will make a simulation of a small assignment.

### 11.2 What do we need?

For this test we need:

- 2 project groups (each group has 2 or 3 members)
- 2 observers
- 1 Teacher
- A computer for each user with the correct version of ActiveWorlds
- Passwords and usernames for the participants
- Two or three quiet places to work
- An assignment
- 3 microphones

Before we start the test we need to start all computers and run Active Worlds.

### 11.3 The steps of the test

First we will give the participants a short introduction of Active Worlds. We will show them how to use the voice chat and the text chat function. This will take place in a project room. This action will take about 5 minutes.

The next step is to split up 2 project groups. Each group will get a virtual and real project room and a computer. This will take about 3 minutes.

The next 5 minutes is for discovering the virtual world by walking around. They can also try to use the functions.

After walking around the participants will move their avatars to the virtual lecture room. There they will get the assignment by voice chat from one of the members of the virtual worlds project. The assignment is: Croatia is becoming a popular vacation destination. Zadar wants to profit from this. Give some ideas to set up a website for potential tourists

that want to visit zadar. Try to think of the information you want to provide and give 2 or more ideas for promoting the website.

The participants will move the avatars again to their own project room. Here they will work out the assignment by using the text chat function. This will take about 20 or 30 minutes. In each project room will be an observer.

After the previous step the project groups will get some time to work on a small presentation.

Now its time to give the presentations. The two groups will use the voice chat to present their ideas. This will take place in the lecture room. Each presentation will take about 4 or 5 minutes.

After finishing the presentations we will have an evaluation. For this we meet again in one project room in real life.

#### **11.4 Evaluation**

We want to ask the following questions to the users. What do you think about:

- The user friendliness. Was the software easy to use? Was it clear what where the functionalities of the different rooms and places?
- What went wrong or good while collaborating? What do you think about the communication? Was it nice to work in the virtual world?
- Do you have recommendations? What did u missed or what do you want to see in the future in this virtual world?

#### Test evaluation

We observed three participants during the test of the virtual world.

#### Controls

We noticed that the participants of the test had some problems with the controls of the software. Users face problems when they use a laptop. This problem is caused by a different type of keyboard. On a laptop keyboard are the controls different than on a home pc.

#### Communication

The participants liked to use a real voice chat instead of text chat. The down sides of this voice chat is that the quality of the audio is not so high. This makes it sometimes hard to understand. The use of text chat has the down side that it is too

Also was the absence of a notepad or mind map tool a point of comment. It was not possible to see who was doing what.

### The usability

Participants liked to work in the virtual world because of the interface. They associate it with computer games. But this is also a down side of the program. The participants where sometimes more playing than working. So the problem is that they are distracted very quickly.

Also is the browser or library inside of the virtual world not used. The participants used the original internet browser to find their information.

Getting stuck in objects was also a problem that the participants faced during the test.

### Conclusion

The participants liked to work in this world because it was fun to use. But this is also the main point of comment. Users are very quickly distracted from their work. Also is the absence of some techniques and tools a down side.

## 12 CONCLUSION

A Virtual World is an online community which operates in a 3D graphical environment. Virtual worlds can be divided into two basic categories: gaming and non-gaming. It is a simulated world which users can access through an online interface. A virtual world is basically a digital version of our own world.

Virtual worlds have been created for different reasons. For example for games, users can play certain games online against opponents from all over the world. But virtual worlds are also developed to socialise, users can join communities with people that have the same interests as them. These worlds are called social worlds. There are also worlds that are developed for educational purposes.

There isn't just one virtual world on the internet, in fact there are hundreds of worlds. These worlds are not the same, but they have a couple of things in common. As we mentioned before, it is possible for multiple users to enter the world. All worlds have graphical user interfaces, this means that the environment looks real compared to the real world. The time in the virtual worlds is also the same, interaction takes place in real time. Every world is also very interactive, users can not only talk to one another, they can also change the environment of the world and collaborate with each other.

Collaboration means working together, that is the essence in this term. Collaboration applications are created to improve the collaboration between two or more working forces like, employees, divisions and organisations.

An important characteristic of collaboration is that collaboration takes place with a common goal. To achieve this goal it's very important to have good communication with each other. The aim of this communication is knowledge sharing.

The present web 2.0 (and 3.0) developments have a lot of influence on collaboration. Think for example at Blackboard. This piece of programming made working at distance a lot easier thanks to document sharing and discussion boards. Web 3.0 developments can also make other group processes digital, like discussions and meetings.

Using a virtual world in addition to regular education makes education more interesting for students and more complete. It should not be seen as a replacement of regular education, but as an addition to regular education. A virtual world provides students, as well as teachers, new opportunities and gives communication and collaboration a whole

new meaning. It prepares students for real-world experiences. Virtual worlds are upcoming and it will only provide more learning possibilities in the future.

Active Worlds (AW) is a 3D virtual reality platform which lets you visit and chat in 3D worlds that are built by other users. Before a user can enter a universe, they need to download and install the Active Worlds software. The four mentioned public universes, all have their own implementations of the Active Worlds client software. As a result of this, a user has to download and install different applications for the use of these universes.

Virtual Worlds support communication and collaboration in a place-like context. "They're very well suited for collaborative work," Caleb Booker, writer and blogger explained: "We're not sure why yet, but there's something about seeing everybody's avatar in the room with yours that makes the whole experience far more effective than if you were to simply have a conference call. It creates a real shared experience

Virtual collaboration means the same as 'normal' collaboration, but communication part during the work process is special. Communication in this case means not face to face but on-line way. In Active Worlds the possibilities for collaboration are limited by technical boundaries. Some things are possible though. Everybody who enters the Active World, are represented by avatars. Chatting is possible in writing and speech. The writing chat can also be limited to one area in the world. This means that only the ones in that room or area can read the chat. Everybody outside that area can't read what is said inside the restricted area. This is not yet possible with the voice chat.

Over 4 years now Active Worlds is active with adding new dimensions to learning. Active Worlds.Inc started up The Active Worlds Education Universe (AWEDU). Active Worlds.Inc has over 80 educational worlds available in AWEDU, and added to that there are a number o educational worlds in the main Active World Universe where classes are taught, experiments are performed and meetings are held.

In 1999, the owners of Active Worlds created the Active Worlds Educational Universe (AWEDU), a universe devoted solely to education initiatives. The AWEDU is an educational universe with nearly one hundred individually owned, created, and maintained educational worlds. The Active Worlds Educational Universe also affords user-extensible provisions and support for building new worlds and adding to existing worlds. Educators registered as world owners are provided with a library of customizable objects from which to define and build their world.

The Active Worlds Educational Universe offers much potential as a resource to extend the traditional classroom setting and as a medium for distance education. The AWEDU environment is restricted to educational initiatives and provides resources to enable even novices in 3D development the ability to quickly construct and customize a 3D virtual world. Owners have access to libraries of hundreds of objects ranging from building items such as walls, floors, and doors to household objects such as tables, chairs, and beds from which to select and customize. Owners can easily add interactive opportunities within the 3D environment by animating objects and textures and by designating sensors that trigger actions and events both within the 3D environment and by activating the integrated web-browser. Additionally world owners may also select from a pool of existing avatars to provide for users visiting their world.

Learners are embodied in the 3D environment in the form of an avatar which allows them to interact with the environment and with each other. In keeping with the current focus on inclusion and diversity in the learning environment, it is important to address how any educational medium supports or inhibits inclusion and diversity of the participants particularly in collaborative learning environments. With regards to diversity, AWEDU is problematic in the ways the design limits users ability to control representation

One area that deserves closer scrutiny is how AWEDU might be intended for use. This may not be suitable as the primary medium for a lecture/discussion style class. Differences in typing skills may disadvantage some students. Additionally, differences in written language skills might also serve as an impediment for other students. Granted in a traditional classroom, differences in communication skills advantage some students over others, however, a traditional classroom also offers a wider range of avenues for non-verbal communication. Although there is indication that AWEDU does offer a degree of embodiment within the design, it does not allow for the variety and complexity of non-verbal communication as is available in a face-to-face setting.

Using Second Life or Active Worlds is quite similar and easy. Within several minutes everybody is familiar with the basic controls and is able to use both worlds. Compared to using, building is not similar and also not that easy. Building in Active Worlds is easier compared to Second Life but Second Life has a lot more possibilities to offer (it is technically and graphical more developed than Active Worlds). However, learning to build in both worlds is just taking some time. The time that's necessary is different for each user.

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In our opinion, Active Worlds is better suited for educational purposes. The techniques that are necessary for educational purposes are almost all available in Active Worlds, Active Worlds is more easy to use and to install, Active Worlds doesn't need an advanced and modern system like Second Life and it is much cheaper to use.

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## RESOURCE LIST

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