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## THE USE OF MULTI-USER VIRTUAL ENVIRONMENTS IN THE FIELD OF EDUCATION

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The development of information and communication technologies (ICT) has brought about a revolution in many fields. Arduous tasks that once had to be carried out manually are today performed with one click of the keyboard. This trend is naturally reflected also in education. Few people today would be able to imagine education without the use of the most modern resources. What has been once just a dream for many people is becoming now a reality.

The long-term development of education has taken place on two fronts. On the one hand, education has been once the privilege of the wealthy but now we are standing on the threshold of a new era in education that is bridging the gap between the rich and poor, between different religions, races, etc. Education is one of the fundamental human rights.

On the other hand – the advances in information and communication technologies have a deep impact also on the development of the forms and modes of learning. Traditional education came to be complemented by ICT-enhanced learning at the end of the 20<sup>th</sup> century. This new form of learning is known as electronic learning or e-learning – a favoured term in our hectic age. Electronic learning has undergone an evolution. Some optimists hoped that e-learning would replace traditional education but time has shown that a teacher's presence in the teaching process remains important. The original aim – to use only e-learning in providing students with education – has therefore not been achieved. However, e-learning as a complementary form of education has found a place in every educational institution as it is not just confined to teaching but is basically also a method of collecting, processing, sharing and providing information.

The evolution is still in progress. Educational institutions are now competing for students, aspiring to offer a high-quality, attractive, tailored product. One response to this challenge is education in virtual worlds with all its advantages and drawbacks. Multi-user virtual environments (MUVE) can be used in the field of e-learning to simulate real situations and for lectures, exercises, virtual meetings, conferences, etc. What distinguishes this from classic e-learning is increased interactivity, the possibility of virtual face to face communication in real time and the simulation of real environments with 3D graphic objects. Education in the virtual environment overcomes various obstacles and surpasses distances.

**Keywords:** *education, e-learning, MUVE, Second Life*

### 1. Introduction

Education is seen as a key investment in modern economies. The importance of education in maintaining economic growth cannot be overlooked. This applies not just to individuals but also to the state. The development of information and communication technologies (ICTs) has revolutionized many fields of life. The field of education is no exception.

#### 1.1. Approaches to education

Modern information and communication technologies were at the centre of attention in the 1990s and introduced important changes into education systems all over the world. Technological progress was accompanied by a discussion about teaching models. This led to a better understanding of these models – the traditional *behaviourist* approach centred around the memorizing of facts has nowadays been replaced by such approaches as *cognitive* approach requiring genuine understanding and *constructivist* approach that focuses on the discovery of new knowledge.

New information technologies (IT) had a remarkable effect on the changes in the content and methods of teaching. Besides improving motivation they also encourage a personal approach to students, an increase in students' control over the learning process and the development of such increasingly relevant abilities as critical thinking, argumentation and cooperation skills [1].

## 2. Multi-User Virtual Environment (MUVE)

What is a multi-user virtual environment? The history of MUVE starts in the 1960s with the creation of the computer game Dungeons and Dragons. This game in conjunction with the Internet lays the foundation for today's MUVE. Other activities besides game playing became possible in virtual worlds due to the Internet. The participants can communicate among themselves in real time, cooperate, discover, create their own spaces, objects, etc. [2].

Virtual worlds, just as any other field of information technology, have been undergoing a process of evolution. The range of MUVES extends from purely text-based projects to highly sophisticated 3D projects. An impressive number of virtual worlds exists today. They can be subdivided on the basis of various criteria – for instance, depending on whether they are 2D (e.g. Project TappedIn) or 3D projects (e.g. DIVE, InterSpace, Active Worlds, IMVU, Entropia Universe), on the type of user, ways of use, user age, etc.

MUVES has been created and are used for a number of purposes. The greatest number of virtual worlds is used for the playing of games, but they can also be used in the following areas:

- Socializing / Online Community Building.
- Education.
- Political Expression.
- Military Training [3].

### 2.1. The basic characteristics of MUVES

Virtual worlds are not a game; there is no score-keeping, no game over. MUVES are 2D or 3D environments that allow an access to many users by means of an online interface. Users are communicating, cooperating, creating common projects with people from all over the world in real time – this kind of activities are very time-consuming and expensive in the real world and often not viable at all [4].

A deeper understanding of virtual worlds requires a mention of the basic characteristics of MUVES. There are many kinds of virtual worlds but all of them share the following features:

- **Shared space** – the virtual world is a space that is shared by many users.
- **Avatar** – a person is represented by a 2D or a 3D graphic interface that is set in space and is visible to everyone (in education this increases the effectiveness of teaching).
- **Immediacy**: interaction takes place in real time.
- **Immersion** – total involvement of the user in the action.
- **Persistence** – the life of the virtual world is not dependent on whether a user is logged on.
- **Socialization** – the virtual world enables the creation of social groups and clubs just as in the real world [3].

### 2.2. Education in MUVES

The many opportunities offered by virtual worlds were discovered also by educational institutions in the 1990s. MUVES fulfil the requirements of contemporary pedagogical theories that demand a constructivist approach to the field of education. MUVE is not just a source of information but it is also, as already mentioned, dependent on contact with other users – it becomes a social issue [5].

Educational virtual worlds are most often backed by educational institutions (universities) and non-profit organizations but there are also virtual worlds that are sponsored by businesses. Those allow students to practice various activities and processes that cannot be tried out in the real world. Teaching takes place in virtual classes and buildings but also in an outdoors environment. Students can use various learning aids with real physical characteristics, developed for the teaching process by teachers. Students may also use the services of libraries and hold dialogues with teachers using real videoconferencing. Different historical periods can be recreated to enable students to experience life in the past. Another possibility is to meet acknowledged experts without needing to leave the room [6].

#### 2.2.1. Advantages and disadvantages

The main advantage of education in virtual worlds is in greater interactivity; there is a possibility of simulating real situations (piloting a plane, training medical personnel, formation of molecules, etc.); face to face communication is more effective (increases the effectiveness of teaching); the field of use is wider – trainings, meetings, conferences. There is also the advantage of enabling people with disabilities to experience a full student life without any restrictions.

However, the amount of time one spends in front of the computer can have a serious impact on one's health. Another very real danger is the possibility of becoming addicted to virtual worlds, which can lead to a breakdown in one's ability to communicate in the real world. Anonymity can encourage the inappropriate behaviour of some users. A potential user should consider all the strengths and weaknesses of virtual worlds, try to eliminate the negative sides and have a responsible approach to virtual life.



*Figure 1.* Inglis House computer lab coordinator Dawn Waller sets up equipment to let Stu Sanderson, 55, an Inglis House resident, work and play Second Life. Picture: Clem Murray/Philadelphia Enquirer (Source: NMIT launches course covering 3d immerse environments. [online] [Quoted 2010-08-13] Available on the Internet: <<http://slenz.wordpress.com/>>)

The following projects are employed in the field of education:

- **The River City Project (RCP)** – a 3D computer simulation for middle grades that looks like a video game and incorporates standards developed by such strategic documents as National Science Education Standards, National Educational Technology Standards and 21<sup>st</sup> Century Skills. (Age of users – 13-19)
- **Whyville** – a project using the results of 20 years of research in the field of education for the development of web-based teaching tools. Whyville is an educational virtual world for children and teenagers involving young people in constructive educational activities and encouraging socially responsible behaviour. Whyville cooperates directly with a number of institutions, for instance NASA (Age of users: 8-15)
- **AquaMOOSE 3D** – a graphic environment designed for research in 3D mathematic images. One of the aims of its creators was to change the negative attitude many students have towards mathematics (Age of users: 13 and older)
- **AppEdTech** – a virtual environment developed at Appalachian State University. It was created with the aim of supporting the social constructivist learning experiences that this university offers its students.
- **Quest Atlantis** – an international educational project for children aged 9 to 16 that use a 3D virtual environment for teaching. (Age of users – 9-12)
- **MUVenation** – a European project financed by the European Commission since 2007 under the Lifelong Learning programme's Comenius school education sub-programme. It seeks to develop a European educational programme for the further education of teachers.
- **Active Worlds Educational Universe (AWEDU)** – this application was created under the initiative Vlearn for virtual education. The project is dedicated to research on virtual education, involving more than 80 educational institutions from all over the world. One possibility is the creation of an entire virtual university. (Age of users – 13 & older)
- **Second Life (SL)** – among the best-known and most accomplished virtual world projects. (Age of users – 18 & older)

### 2.3. Second Life

As already mentioned, SL is the best-known and most widely used multi-user virtual environment that also has its own economy. This three-dimensional virtual project has the most sophisticated graphics. Many institutions such as universities, other institutions of higher education, libraries and government bodies use SL as a platform for education.

This environment is popular among teachers and researchers as it is more personal than traditional distance learning. Through their avatars users can attend lectures and conferences in the virtual building of an educational institution. Many universities from various parts of the world are teaching courses or carrying out research in this environment. A considerable number of universities have also created libraries where students can look at or order books. Lectures can either be recorded or take place in real time from anywhere in the world.

The New Media Consortium (NMC), a not-for-profit consortium, created a virtual project in SL called NMC Campus [6]. It helps more than 150 colleges and universities learn to make broad use of virtual spaces, including institutions like MIT, Harvard, Yale, Princeton, USC, Rice, and many others. The NMC has built the largest educational project in any virtual world [7]. The best-known virtual campuses in SL include: Harvard Law School's Austin Hall, New Media Consortium Campus, Ohio University Campus, Bowling Green State University Virtual Campus, Northern Illinois University's Glidden Campus, Virtual University of Edinburgh, Saint Leo University's Virtual Campus and Democracy Island (NYLS) [8].



Figure 2. Learning in Second Life. (Source: Vzdělávání míří do Second Life. [online]. [Quoted 2010-05-27]. Available on the Internet <<http://www.secondlife.cz/vzdelavani-miri-do-second-life>>)

#### 2.3.1. Second Life + Moodle = Sloodle

Moodle is among the most popular free open source software. It is described as an e-learning environment or a course management system. As educational functions are among the most popular in Second Life, the merging of Moodle and Second Life into Sloodle seems only natural.

Sloodle provides a range of tools for supporting learning and teaching to the immersive virtual world; tools which are fully integrated with a tried and tested web-based learning management system used by hundreds of thousands of educators and students worldwide [9]

#### 2.3.2. Language learning

Very many courses are taught in SL but the most common activity there is language learning. Many language courses are free but one should pay attention to who is teaching them. A course may be taught by a native speaker but not necessarily a qualified teacher. This is why it is preferable to sign up for paid courses as one can be sure of being instructed by a professional teacher usually from either the UK or America. Teachers are certified and mostly teaching languages also in the real world.

### 3. Conclusions

The constant development of information technologies is opening new ways of using the Internet and education. We have entered a new phase of the web known as Web 3.0 that brings both students and teachers exciting new opportunities to broaden their skills and learn effectively both in and outside the school.

Even so no one can overlook the fact that integrating technology into education is challenging and influenced by a multitude of factors. Technology's successful integration in education is more than just using computers in a classroom. It involves a transformation of what we do and the preparation of students for learning in a technologically sophisticated learning environment.

Today, as the economic crisis is culminating, every company tries to reduce costs. Businesses are often cutting costs where possible and the field of education is among the first targets. One solution for businesses is electronic learning (e-learning). Students are interested in teaching that is better connected to reality, tailored to their needs, appealing, interactive and effective. Learning in the virtual world meets all those expectations.

A dissertation being written at the University of Zilina, Faculty of Operation and Economics of Transport and Communications, Department of Communications, is concentrating just on these issues. Educational institutions in the Slovak Republic are so far not making use of opportunities offered by education in virtual worlds. A survey of MUVE projects showed Second Life as an impressive educational environment. Slovak users are familiar with SL thanks to the Philosophical Faculty of Palacky University in Olomouc in the Czech Republic. This is the first among the universities in the Czech Republic or Slovakia to enter this new area. The faculty resides in a Czechoslovak virtual town called Bohemia.

The intention of the dissertation is to create an economic evaluation of the processing of electronic education contents. We are aware of the fact that SL is offering possibilities of creating environments tailor-made for the specific requirements of educational institutions. One of the partial aims of the dissertation is to carry out an economic evaluation of offering an e-course in SL that could then – provided that the results of the evaluation are positive – be offered to the wider public (businesses, universities). The task is to create a course of Occupational Safety and Health and Fire Protection (OSHFP) that students could attend in the virtual world of SL.

OSHFP courses must be attended in Slovakia regularly. This is very costly for employers as besides having to pay a lecturer they also have to rent rooms where the course will take place. Further costs result from employees attending the course being absent from the workplace for at least an hour or two. From the perspective of the employee this time is often wasted as they spend the training doing something other than listening to the lecturer. This is our reason for thinking that developing such a course in the virtual environment can bring considerable advantages for businesses, enabling the employee to join the training in SL at a certain time right from the workplace, attend the lecture and complete the training by taking a test that would allow an objective assessment of knowledge thereby gained. Provided that more businesses take an interest in the course, costs would also decrease as they would be divided among the participants. This type of course would also be welcomed by those attending it as the virtual environment allows for the simulation of real activities, enabling the students to train activities and processes. And of course seeing something for oneself is more effective than just listening someone talk about it.

The issue of offering a course in SL gives rise to many important questions: where would such a course or courses take place (the construction of buildings, cooperation with existing virtual campuses like for instance NMC Campus), staff and technical provisions, creating the contents of the course, etc. These questions will be material for further research.

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