



The AntiBullying Village

for kids and teens

3D Virtual Learning Environments for working with young people

A handbook for Teen Educators



This booklet was produced by the members of the ABV4Kids project:

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Introduction.....	3
3DVLEs and Young People – Net Generation.....	4
Background.....	4
Virtual Worlds: introduction and background information	4
Examples for virtual worlds.....	4
History and recent development	5
OpenSim.....	7
Using virtual worlds for educational purposes.....	8
The potentials using virtual worlds for working with young people	8
The limits of virtual worlds	13
The ABV4Kids project	17
Aims.....	17
Partners.....	19
Experiences by partners.....	22
Practical issues	26
Technical issues	26
The Technological infrastructure	26
The centralized services.....	26
The Client PC and the Network.....	28
Running the client application	29
The technical support	30
Working with OpenSim.....	31
How to prepare a workshop of other activities in a virtual world?	31
Conclusion	33
Resources	35





Introduction

3D virtual worlds enable their users to interact with each other through animated 3-D representations called avatars. Second Life is the most popular example of the latest generation of 3D virtual worlds. Since its opening to the public in 2003 Second Life has gained increasing popularity. More than other virtual worlds Second Life attracted the attention of media and the public what resulted in a dramatic growth of registered users in late 2006 leading to a today's total of more than 14 million registered users. There are critical saying that Second Life has been overhyped and overestimated. Indeed, statistics suggest a slowing growth rate in terms of new registrations and a lower public interest.

However, especially in the field of education 3D virtual worlds, especially Second Life, have gained an increasingly important role in recent years and attracted numerous universities, colleges, schools and other educational institutions. Also, the number of resources for educator using 3D virtual worlds – such as video tutorials, manuals, newsgroups, forums, Wikis and websites – as well as various features that facilitate student interaction and learning processes within 3D virtual worlds – such as the opportunity to make use of video or audio files, voice chat, PowerPoint presentation and even adaptations of learning management systems such as Moodle – make 3D virtual worlds particular interesting applications for educators.

In this handbook we will examine what 3D virtual worlds are, what evolutionary steps led to their development, what makes them unique and what social impact they have? We will outline what makes 3D virtual worlds interesting for educators, in which ways they can be used for education and where 3D virtual worlds have strengths and limits are.





3DVLEs and young people – Net Generation

Having grown up with digital technologies like computers, the Internet or mobile phones young people are considered to be “digital natives” (Prensky, 2001). Nowadays new media are an integral part of young people’s everyday’s life. In many European countries the vast majority of young people has access to the Internet and makes use of social networks, instant messaging or content sharing sites (EU-Kids Online, 2009).

Today around 135 million people are active users of virtual worlds with 45% of users aged 10-15, another 30% aged 15-25. The increasing relevance of virtual worlds is underlined by projections that predict 750 million users in the age range of 10-25 by 2013 (Kzero, 2009).

Background

Virtual Worlds: introduction and background information

Examples for virtual worlds

A virtual world is a computer-based simulated environment in which users interact using avatars as their virtual representations. Typically virtual worlds reproduce features of the physical world (Chesney et al., 2007¹). Virtual Worlds like Second life for instance include virtual counterparts or real cities or real objects (e.g. cars, dancing clubs or museums). They simulate real world’s physical laws such as gravity or locomotion, they establish social systems and ways of interacting with each other that widely resemble real world’s structures; some such as Second Life even have their own economy and currency. Though there are several different types of virtual worlds, there are six distinctive features all of them share (cp. Virtual World Review²):

¹ <http://www.nottingham.ac.uk/%7Elizecon/RePEc/pdf/21.pdf>

² *Virtual World Reviews (n.d.). What is a virtual world?* <http://www.virtualworldsreview.com/info/whatis.shtml>





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

Virtual worlds are not a recent development but go back as early as to the mid seventies (Terdiman, 2006³). Second Life is only one example of a rather recent type of virtual worlds. Together with other popular virtual worlds such as Active Worlds⁴ , There⁵ or Kaneva⁶ Second Life results from a long chain of developmental steps that reach from so called multi-user-dungeons (MUD), over massively multiplayer online game (MMOG) to Web 2.0 and metaverses.

History and recent development

The first virtual worlds that were available online were merely text-based with a limited graphical interface, often in form of chat rooms or online communities. One of the first computer games that bore all the characteristics of a virtual world was Maze War⁷, released in 1974. Amongst others Maze War was the first networked 3D multi-user first person shooter game that used avatars and that featured an in-game chat that facilitated social interactions "in world".

³ Terdimann, D. (2006). Newsmaker: A brief history of the virtual world. Interview with Bruce Damer, DigitalSpace CEO. CNET News. http://news.cnet.com/A-brief-history-of-the-virtual-world/2008-1043_3-6134110.html

⁴ <http://www.activeworlds.com/>

⁵ <http://www.there.com/>

⁶ <http://www.kaneva.com/>

⁷ http://en.wikipedia.org/wiki/Maze_War





The release of the game **Multi-User Dungeon (MUD)** in 1978 had a wide impact on several future developments and was eponymous to a whole genre of games. Traditionally developed for playing adventure games MUDs are merely text-based multi-player online game that combine features of role-playing games and real-time chats. As Rheingold (1993⁸) puts it MUDs are “imaginary worlds in computer databases where people use words and programming languages to improvise melodramas, build worlds and all the objects in them, solve puzzles, invent amusements and tools, compete for prestige and power, gain wisdom, seek revenge, indulge greed and lust and violent impulses.”

While MUDs were usually text-driven the next generation of virtual worlds, **massively multiplayer online games (MMOG or MMO)**, is graphic-based. MMOGs connect simultaneously thousands to hundreds of thousands of players via the Internet. MMOGs usually aim at making players cooperate and competing with each other in a persistent online universe. There is a broad range of MMOG types that include for instance real-time strategy games, first-person shooter games, social games, racing games, real-world simulations or MMO role-playing games (MMORPG). Most of today’s most popular online games such as World of Warcraft⁹, EverQuest¹⁰, The Sims Online¹¹ or Habbo Hotel¹² are good examples of MMOGs, some of them uniting millions of Internet users.

In recent years the emergence of the so called **Web 2.0** also has had a clear impact on the evolution of modern virtual worlds. The term Web 2.0 in some ways is misleading as it suggests a new version of the WWW. However, it’s neither the general technical specifications nor the basic activities of Internet users that have changed. It is rather the applications used that facilitate the publication of user-generated content, online collaboration and sharing among users like e.g. weblogs, wikis, social networking sites or podcasts. These applications have changed dramatically over the past years (Madden & Fox, 2006) and made possible a new generation of web sites such as Wikipedia, YouTube, Flickr or Facebook. They pave the way for a Web that is less static but instead is dynamic and made by people, a development that has only started recently and that opens a whole wealth of

⁸ <http://www.rheingold.com/vc/book/5.html>

⁹ <http://www.worldofwarcraft.com>

¹⁰ <http://everquest.station.sony.com>

¹¹ <http://thesims.ea.com/us/>

¹² <http://www.habbo.com/>





possibilities in future. Modern virtual worlds such as Second Life or Active World are often referred to as **Metaverses**. The term Metaverses builds upon Neal Stephenson’s science fiction novel “Snow Crash” that envisioned a virtual 3D world inhabited by avatars.

As pointed out in the Metaverse Roadmap¹³ “in recent years, the term has grown beyond Stephenson’s 1992 vision of an immersive 3D virtual world, to include aspects of the physical world objects, actors, interfaces, and networks that construct and interact with virtual environments. (...) The Metaverse is the convergence of 1) virtually enhanced physical reality and 2) physically persistent virtual space.” Future visions suggest that virtual worlds such as Second Life and other applications sooner or later may merge into one Metaverse (Roush, 2007¹⁴) and that the boundaries between the real and virtual worlds will blur increasingly. Second Life in its current form may not be the future of the Internet. However, on the way leading to 3D Metaverse it may be one important milestone.

OpenSim

OpenSim (appreviation for ‘Open Simulator’) is a platform for creating 3D virtual environments that resembles the virtual world of Second Life. OpenSim uses the so called ‘Second Life viewer’, a user interface that enables you to move in our virtual village with your avatar. OpenSim looks like Second Life. However, unlike Second Life that is hosted on servers of a Californian company named LindenLab, OpenSim can be hosted on own servers. In this way it can be ensured that the virtual village is a safe environment that can only be accessed by young people and adults you have confirmed before. The OpenSim world is solely made by its users. At the beginning you will have an empty island that will be planned and shaped with your and its users help.

¹³ <http://www.metaverseroadmap.org/overview/>

¹⁴ <https://www.technologyreview.com/Infotech/18911/>





Virtual 3D environments such as Active Worlds, Second Life or OpenSim are opening up new opportunities for education and e-learning (Johnson, 2006; Hetherington & Wheeler, 2007) and experts suggest that SL has the potential of revolutionising e-learning. There are already numerous online communities of several thousand online educators (e.g. “Educators and Teens” in Second Life, SimTeach), numerous Universities and Colleges (e.g. Harvard or Stanford University), companies and others that actively use virtual 3D environments for educational purposes.

Due to the fact that OpenSim and Second Life are mainly the same and that the focus of research was set on Second Life as one of the biggest and most popular 3D virtual environments in the recent years this handbook also will focus on Second Life when it comes up to using virtual worlds for educational purposes.

Using virtual worlds for educational purposes

The potentials using virtual worlds for working with young people

In recent years Second Life has attracted an increasing number of educational initiatives universities, colleges, schools and other educational institutions that offer virtual classrooms as a means to extend and enhance their online offerings to students (Kirriemuir, J., 2007¹⁵). According to Sussman (2007) more than 300 Universities in August 2007 have been using Second Life for a variety of purposes. The SimTeach Wiki¹⁶ provides a comprehensive overview about institutions and organizations in Second Life. Accordingly, Universities that run virtual campuses in Second Life include for instance the Universities of Harvard, Stanford, Princeton, Edinburgh, Hong Kong, Hamburg and many others from

¹⁵ Kirriemuir, J. (2007). *The Second Life of UK Academics. Ariadne Issue 53.*

<http://www.ariadne.ac.uk/issue53/kirriemuir/>

¹⁶

http://www.simteach.com/wiki/index.php?title=Institutions_and_Organizations_in_SL#UNIVERSITIES.2C_COLL EGES_.26_SCHOOLS





around the globe, Educational Organizations like the British Council, Eduserv or Global Kids as well as libraries such as the Illinois' Alliance Library System.

One reason for the increasing interest of academics in using Second Life for educational purposes lays certainly in its potential to give students a sense of embodiment and – virtual – face-to-face interaction with other students, a feature that clearly goes beyond conventional Internet-based learning platforms. Also, for tutors it's relatively easy to create learning environments that resemble their real-life-counterparts including the option to make use of i.e. PowerPoint presentations or even of popular learning management systems such as Moodle that has been adapted to the Second Life-environments in form of the learning platform Sloodle.

A further aspect that may Second Life make more interesting than other 3-D virtual worlds is the availability of numerous, well-structured tutorials – most of them produced by Second Life-inhabitants themselves – as well as numerous resources for the International community of educators. Apart from mailing lists for educators such as “Second Life Educators”¹⁷, “Educators and teens”¹⁸ or “Healthcare Support and Education”¹⁹, there are several online communities, weblogs, forums and Wikis supporting educational activities within Second Life such as SimTeam²⁰ or Second Life Grid²¹.

There are various possibilities 3D virtual worlds like Second Life provide to educators and learners other 2D online learning environments do not have. As Jo Kay and Sean FitzGerald note “the unique qualities of a 3D virtual worlds can provide opportunities for rich sensory immersive experiences, authentic contexts and activities for experiential learning, simulation and role-play, modelling of complex scenarios, a platform for data visualisation and opportunities for collaboration and co-creation” (cp. “Second Life in Education”²²). 3D environments and their capability of giving users a sense of embodiment and real-time face-to-face interactions in one common virtual room

¹⁷ *Second Life Eduators (Second LifeED)*, <https://lists.secondlife.com/cgi-bin/mailman/listinfo/educators>

¹⁸ <https://lists.secondlife.com/cgi-bin/mailman/listinfo/educatorsandteens>

¹⁹ <https://lists.secondlife.com/cgi-bin/mailman/listinfo/healthcare>

²⁰ <http://www.simteach.com/>

²¹ <http://secondlifegrid.net/>

²² <http://sleducation.wikispaces.com/educationaluses>





transcendent the possibilities of groupware that are restricted on text-, voice- or video-based communication and in some ways blurs the boundaries between virtual and real life. More than other electronic tools for distance communication, users have an improved sense of being 'there' in a classroom, rather than of being a disembodied observer (Kemp & Livingstone, 2006). This potential of 3D virtual worlds opens up new possibilities for collaborative learning processes and experimental learning (Dickey, 2005²³). At the "Second Life in Education" web site, Kay and FitzGerald provide a comprehensive compilation of educational uses of Second Life, some of them listed in box 1 below. On their web site each of these categories gets illustrated by several examples and screenshots of selected educational projects and initiatives within the Second Life environment.

Box 1: Educational uses of Second Life

(Excerpt from a compilation published by Jo Kay and Sean FitzGerald²⁴)

Distance and Flexible Education

Second Life provides an excellent platform for flexible delivery and online education. Students and facilitators can come together in-world to share information and resources via slides, audio and video, engaging in discussions, presentations, group projects and explorations.

Presentations, Panels and Discussions

Second Life's ability to create a sense of presence, shared space and shared experience makes it ideal for presentations, panels and discussions. Presenters can show slides and videos and stream their voices into the world.

²³ Dickey, M. D. (2005). "Three-dimensional virtual worlds and distance learning: two case studies of Active Worlds as a medium for distance education." *British Journal of Educational Technology* 36(3): 439-451.

²⁴ <http://s2education.wikispaces.com/educationaluses>





Training and Skills Development

The Second Life platform allows for the development of a range of strategies and spaces for training and skills development. Users can access a range of training options in Second Life - both useful in the virtual world and in real life!

Self-paced Tutorials

The in-built building and scripting tools in Second Life allow for the creation of sophisticated self-paced tutorials, allowing residents to learn both real world and Second Life skills.

Displays and Exhibits

Second Life residents are creating displays and exhibits on a broad range of subject areas. Using images, text and multimedia they are able to create dynamic, interactive displays and exhibits which avatars can move in and interact with.

Immersive Exhibits

Immersive Exhibits in Second Life allow residents to engage in, experience and respond to information in context, allowing for a deeper understanding of places, situations or circumstances.

Roleplays and Simulations

Second Life allows students to undertake a range of role-plays and simulations, practicing real life skills in a virtual space or exploring situations that they could not undertake safely or easily in the real world.

Data Visualisations and Simulations

Advanced scripting and building tools built into the Second Life platform allow for the development of complex data visualisations and simulations.





Libraries, Art Galleries and Museums

Second Life currently hosts a range of Libraries, Art Galleries and Museums where residents can engage in events, discussions, and displays on a wide range of topics.

Historical Re-creations and Re-enactments, Living and Immersive Archeology

The Second Life platform allows for the creation of amazing, immersive environments based on historical places and events. These environments can be used for a range of learning activities including role-plays, action learning and research and historical study.

Artificial Intelligence Projects

The built in scripting tools allow users of Second Life to explore a range of Artificial Intelligence concepts.

Art and Music Projects

In one sense, all of Second Life is one big arts project, as all of the content is user-generated. However, there are plenty of examples of original artworks, both in galleries and in the "open", from scans of paintings and drawings from the real world to 3D dynamic and interactive sculptures and installations that make use of the unique 3D qualities and building tools of the Second Life platform.

Theatre and Performance Art

Second Life offers the ability to create a range of performances and theatrical events. Easy to customise avatars and the ability to make elaborate sets and props quickly and cheaply makes it an appealing platform to some performance artists.

Language Teaching and Practice, and Language Immersion

As well as being used by language teachers - including ESL/TESOL - to run language classes, Second Life also provides opportunities to interact with native speakers of target languages.





Support and Opportunities for People with Disabilities

Second Life has also been used to help abused children redevelop socialising skills; adults with cerebral palsy to allow them to share personal interactions without prejudice.

Business, Commerce, Financial, Economy Practice and Modelling

Second Life has a real economy and currency exchange making it possible to experiment with running businesses and engaging in economics modelling in a low-risk environment.

Architectural Design and Modelling

Second Life can be used to create fly-throughs of houses for sale, prototype architectural designs, checking out hotels and other accommodation before you book. Check out the facilities at a university you are thinking of attending (including the dorm rooms if you are thinking of living on campus).”

There are several video clips available at YouTube and other that introduce in the educational use of Second Life. Two well-done and advisable clips are “Educational Uses of Second Life”²⁵ and “Education in Second Life: Explore the Possibilities”.

The limits of virtual worlds

In the meantime there have been numerous educational projects and activities that made use of the Second Life environment and there are both enthusiastic and critical voices in terms of the potential Second Life has for education. As a part of an evaluation study related to the use of Second Life as an instructional setting for an English course, Traphagan (2007²⁶) amongst others examined whether

²⁵ <http://youtube.com/watch?v=qOFU9oUF2HA>

²⁶ Traphagan, T. (2007). *Evaluation of a Pilot Use of Second Life in an English Course: 2006-2007*. <http://www.utexas.edu/academic/mec/publication/pdf/fulltext/SecondLife.pdf>





students found Second Life easy to use and how they felt about using Second Life in a course. All in all, Second Life was perceived as not very user-friendly and not good for self-learning. While students found Second Life’s basic functions such as moving their avatars, communicating with others by chat or instant messaging or socialising with other students rather easy to handle, more complex activities like creating objects or placing texts in Second Life were perceived as difficult. Several students characterised the Second Life interface as being relatively unintuitive and called for better training, assistance or comprehensive manuals and tutorials. Second Life was regarded as very useful for learning and understanding others’ perspectives by means of role playing through an avatar. Also, on the rather positive side of using Second Life was the facilitated sense of class community.

The following box provides selected key recommendations that Traphagan derived from his students’ questionings.

Box 2: Using Second Life in education: key recommendations

(Excerpts from Traphagan, T. (2007). “Evaluation of a Pilot Use of Second Life in an English Course”²⁷)

Take students’ gaming background into account

Do not assume that all students are gamers simply because they are in the Net Generation. Assess students’ gaming experiences, if possible, and design Second Life learning activities and Second Life training with consideration of students’ Second Life technical skills, based on their previous gaming experience unless the development of Second Life technical skill is a learning objective.

Provide adequate training, a manual, and/or tutorials

The interface of Second Life is not intuitive for users in general. Even when learning activities require only easier tasks, such as moving avatars and communicating, it is essential to provide enough

²⁷ Traphagan, T. (2007). *Evaluation of a Pilot Use of Second Life in an English Course:2006-2007. The University of Texas at Austin.* <http://www.utexas.edu/academic/mec/publication/pdf/fulltext/SecondLife.pdf>





support resources—such as training, manuals, and/or tutorials—to ensure that students are familiar enough with Second Life that they can concentrate on the learning activities comfortably, without being hindered by their knowledge of Second Life. If possible, provide both training sessions and self-training resources, such as manuals and online tutorials.

Take advantage of Second Life’s affordances—visual, three dimensional, and avatar-rich

Second Life is effective for helping students to learn how to integrate visuals and writing, learn about architecture, understand others’ perspectives by means of role playing through an avatar. It appears that using Second Life to improve learning is effective when instructional design takes advantage of Second Life’s strong features, such as providing three-dimensional visual input, and an avatar-based social experience. More information should be sought to determine what types of learning may be facilitated by Second Life. Firmly anchor Second Life instructional activities in learning objectives and contexts, and explicitly communicate how activities are expected to facilitate attaining the objectives.

Avoid competition among students on the basis of Second Life skills

For many students, using Second Life is struggle, so they experience considerable frustration when faced with competing tasks for which Second Life skills are critical. Additionally, providing time guidelines or limit for time to be spent for assignments may help students avoid spending unnecessarily large amount of time and frustrate themselves.

Capitalize on social interactions in Second Life

Capitalizing on social interactions is likely to help create positive learning experiences. One should consider adopting Second Life, if the activity requires or maximize the benefits of the social interaction opportunities afforded by Second Life.

Provide moderators for discussions

Moderators are essential to discussions in Second Life, which would benefit from clearer structure. It is recommended that moderators be trained to perform several critical tasks: Regulate the flow of discussion so that a new topic is not introduced before participants have finished writing about the present topic. Regulate speaking turns so that all participants have opportunities to express themselves fully. Save notes or a summary of the history of the discussion for later reference. Take snapshots of Second Life discussions, if necessary.





Global Kids, Inc (2006) provide an overview about best practices in using Second Life for education. Again, the authors emphasize that the strengths of virtual worlds such as Second Life is its ability to make users collaborate and interact. Furthermore they see strengths it the potential Second Life to foster social networking processes, its benefits when being used as a distance learning tool, the playful acquisition of ICT skills and the huge pool of resources, tools, manuals and list servers that are available for Second Life and that can help facilitating educators' work.

Kemp and Livingstone (2006²⁸) compare virtual worlds such as Second Life with traditional learning management systems and note that Second Life has some distinct advantages in terms of enhancing the experience of learning. Apart from giving the users a sense of embodiment (in contrast to the sense of being a rather disembodied observer in traditional learning management systems) they highlight the power of rich 3D demonstration models and multi-media material over purely written means (cp. Laurillard, 1997²⁹). However, the authors also note some clear disadvantages. For instance they see Second Life as very poor document repositories. Text note cards used within Second Life are simple text documents that only support very limited formatting. Also, though educators can incorporate PowerPoint presentations in Second Life is rather complex and requires a certain technical knowledge. They also point at the considerable hardware demands of Second Life that often go beyond the capabilities of typical labs in most schools and colleges.

Examining the "hype and reality around virtual worlds" the analyst company Gartner, Inc. (2007³⁰) concludes "that the hype surrounding Second Life is considerably bigger than the virtual world's real-life relevance." According to Gartner many Second Life-based projects fail to meet their high expectations, however "the failure is so high because companies are focusing on the technology rather than on understanding end-user requirements". Many companies build their projects on the

²⁸ Kemp, J. & Livingstone, D (2006). *Putting a Second Life "Metaverse" Skin on Learning Management Systems.* <http://www.sloodle.com/whitepaper.pdf>

²⁹ Laurillard, D. (1997) *Learning formal representations through multimedia.* In: Marton, F., Hounsell, D., Entwistle, N. (eds) *The experience of learning: implications for teaching and studying in higher education.* 2nd edition, Scottish Academic Press, Edinburgh.

³⁰ <http://www.gartner.com/it/page.jsp?id=503861>





“cool” factor of Second Life projects and focus too much on technology, while at the same time their projects lack of clear objectives and a limited understanding of their target groups’ requirements.

The ABV4Kids Project

Aims

The ABV4Kids project aimed establishing a virtual village on school bullying and violence, racism and xenophobia within OpenSim a 3D virtual learning environment.

The project’s first phase focused on establishing the infrastructure of the Anti-Bullying-Village (ABV) that was commonly created by the partners and school teams from the partner countries. The ABV consists of a Virtual Parliament that hosted parliamentary sessions of pupils from all partner countries, a Virtual School that includes classrooms created by the school teams and a Creative Arts Centre, a public place that includes exhibition areas, a virtual cinema and a public stage.

The project’s second phase focused on events and activities that were held at the ABV, i.e. a 2-day conference for young people, workshops, role plays, public discussions and exhibitions. Also, each school team prepared one event such as exhibitions, film productions or composing songs. In the second phase the ABV and its events were also opened up to pupils and young pupils from throughout Europe.

The project built on the educational potential 3D VLEs offer. More than other online platforms they give their users a sense of real time involvement, promote new forms of social interaction and give them room for creative processes (cp. Carr, 2008; Salt et al., 2008) what makes them highly attractive for young people. The project explicitly aimed at involving young people in the planning, development and creation of the ABV and its events.





Apart from making them deal with the project's overall topic of school bullying, violence, racism and xenophobia, the project was meant to be a practical exercise in commonly establishing a platform that promotes e-participation and intercultural cooperative processes. In a playful way this not only promotes social thinking, e-collaboration and e-competences, it also encourages the reflection of the cultural diversity of Europe in terms of languages, working styles and ways of thinking.

The ABV4Kids project primarily addresses pupils affected by or interested in the problem of school bullying. In the project's first phase aimed at planning and creating the virtual infrastructure and architecture of the virtual Anti-Bullying-Village (ABV) the activities focused on selected schools respectively teams of pupils from schools from the partners' countries, while in the project's second phase the ABV was opened up for pupils from throughout Europe. Apart from pupils themselves teachers from each of the schools were involved mainly in the project's first phase in order to coordinate the activities of their school team as well as in order to ensure communication and cooperation with the national contact person of the respective partner country.

Apart from the direct target groups of pupils and schools themselves the project, its outcomes and experiences will be of interest for a broader International audience of professionals (e.g. teen educators, teachers, researchers, counselors etc.) and other dealing with the problem of school bullying.

After the project's official end not only the ABV shall remain online but also the project's portal with its forum, blog(s) and other project-related resources. Moreover, a number of resources related to the project will be available by the project's end such as video clips at YouTube, postings in forums, reports in SL-related media or the media in general that will contribute to ensure the ABV lasting attention. Apart from reaching the project's long-term target group by means of the ABV, the project's web site as well as by means of numerous web resources that will refer to the project, it will be included in the partners' existing web portals and activities. The German partner (zefp) for instance coordinates a virtual Anti-Violence-Campus for Adults in Second Life and has a vital interest to promote the ABV for adults working with teens. Other partners such as Actionwork (UK) that





organizes yearly conferences for pupils in the UK have expressed interest in using the ABV's facilities in the long-run in order to reach a broader, more International audience.

Partners

The ABV4Kids&Teens project is a cooperative project of experts from Germany, Italy, Israel, Norway, Poland, the United Kingdom and Bulgaria. We are various organizations from 7 different countries:

Centre for Educational Research, University of Koblenz-Landau (Germany)³¹

The Centre for Educational Research (Zentrum für empirische pädagogische Forschung, zepf) is a research institute of the University of Koblenz-Landau involved in basic-oriented as well as application-oriented research in a wide range of national and International projects. The zepf is divided in four Centres of Excellence: Education, teaching and learning, advancement and development, health and well-being. All Centres of Excellence build on the following competence and expertise: educational-psychological diagnostics, evaluation, and development of educational and psychological concepts and trainings. The zepf has been involved in several national and EU-funded projects related to school bullying, ICT and numerous other topics. Amongst others, the zepf has coordinated the EU-projects CyberTraining (a research-based training manual on cyberbullying), VISTOP (online courses on school bullying and violence), VISIONARY (a European web portal on school bullying and violence), VISIONARIES-NET (online conferences on school bullying and violence) projects CyberTraining (a research-based training manual on cyberbullying) Furthermore the zepf has been a partner in the EU-projects aVataR@school (virtual role plays in Second Life) and Comparative analysis on methods successfully applied in the fight against bullying.

Infoart, Plodiv (Bulgaria)³²

Infoart is an SME established in 1990. Major fields of activities are consulting and engineering, electronic publishing services, design, development and delivery of innovative e-learning content and technologies, e-Training, graphic art services. Infoart develops projects in electronic publishing

³¹ <http://www.zepf.uni-landau.de/>

³² <http://www.infoart-bg.com/>





technologies, multimedia, e-learning or e-business systems. For the past 21 years the company took part in research and applied projects of the EC programmes, international and national institutions, universities and private companies.

CINECA - Consorzio Interuniversitario (Italy)³³

Cineca is a nonprofit Consortium, made up of 37 Italian universities, The National Institute of Oceanography and Experimental Geophysics - OGS, the CNR (National Research Council), and the Ministry of Education, University and Research (MIUR). Today it is the largest Italian computing centre, one of the most important worldwide. With more than three hundred and fifty employees, it operates in the technological transfer sector through high performance scientific computing, the management and development of networks and web based services, and the development of complex information systems for treating large amounts of data. Its institutional mission also includes the creation of management systems and services to provide support for Universities and the Ministry of Education, University and Research (MIUR). In this role, the Consortium is engaged in the constant search for solutions capable of accompanying Universities as they modernise their methods of governing such complex and intricate areas. CINECA is one of Italy's main representatives in European Union projects, participating in numerous activities related to the promotion, development and diffusion of the most advanced information technologies.

Actionwork Worldwide Limited (United Kingdom)³⁴

Actionwork (UK) was formed in 1990 and is a multimedia creative arts organisation. Actionwork works primarily in resolving conflict with young people, through theatre in education, film in education, international anti-bullying conferences, and festivals. Actionwork puts young people at the front of all its work and creative programmes. Actionwork tackle issues such as bullying, mobbing, violence in schools, racism, sexism, homophobia and prejudice through peer support, youth participation, peer-mediation, restorative justice, and a variety of creative and non-punitive techniques, including role-play, improvisation, theatre, games, dance, song, storytelling, film and

³³ <http://www.cineca.it/>

³⁴ <http://www.actionwork.com/>





poetry. Actionwork is renowned for its innovative work with young people in schools and other community settings, by continuing to find ways of reaching convivencia and peace in schools. Actionwork clients include : British Council, Department for Education And Skills (DfES), SIETAR Japan, DT Norway, Inner London Probation Service, County Councils across the UK, Thames Water PLC, DT Romania, IC University (Japan), Kanagawa Complex, the Anti-Bullying Alliance (ABA), Rowan Romania, Saddler’s Wells Theatre London, Albany Theatre London, Society for Intercultural Education Training and Research (SIETAR), and over 1000 schools. Actionwork tours the International Anti Bullying Roadshow.

Barnevakten - Kids and Media (Norway)³⁵

Kids and Media is a non-profit, charitable organization which gives information and advice about children’s use of digital media. Their vision is to see children and teenagers using media with safety and awareness. The target groups are parents, pupils and professionals working with children and teenagers. Kids and Media seek to support, equip and empower parents and professionals who work with children and teenagers. Their work is rooted in the UN’s Convention on the Rights of the Child. The information and advice our organization gives is politically and religiously neutral. The organization has its own board and professional advisory council consisting of people who represent varied proficiency within school, children’s and youth work, digital media, psychology and family counseling. Kids and Media is based on voluntary work and is mainly financed through economical gifts from parents. We also receive funding from The Norwegian Ministry of Children and Equality.

The Pedagogical Academy in Lodz (Poland)³⁶

The Pedagogical Academy in Lodz is a private higher education institution which provides activities within the fields of pedagogy, special education and sociology. We offer the two-level study system with bachelor and master degree in education as well as doctoral seminar and a great offer for postgraduate students. The Pedagogical Academy in Lodz launched activities in the field of external cooperation and exchange (the bilateral cooperation, as well as within LLP programmes). The

³⁵ <http://www.kidsandmedia.co.uk/>

³⁶ <http://en.wsp.lodz.pl/>





Pedagogical Academy in Lodz pursues consulting and educational activities for local communities as well as people and institutions concerned. Many educational and scientific conferences and debates were organized, mainly dedicated to problems of peer aggression, new media, cyberbullying, special education needs and the risk of exclusion. The staff is involved in a number of research projects both, on national and international level (e.g. dr Jacek Pyżalski and dr Piotr Plichta represent Poland in COST-European Cooperation).

Open University of Israel³⁷

Open University of Israel is a higher education institution with distance teaching/learning methods. The OUI provides undergraduate and graduate degree opportunities for more than 40,000 students. The OUI uses variety of advanced technologies in order to improve learning materials and holds on-line courses, using multimedia materials as well as managing individual and group communication for students and tutors. The Education and Psychology Department and Teachers Continuing Education Unit develop and operate variety of training programs courses, which encompass courses, workshops using blended learning facilities. The OUI Center for Information Technology aimed in improving teaching and training by integrating technology into teaching. The Center includes pedagogical experts along multimedia, computer and technology professionals, for developing, studying and evaluating the systems, applications and methodologies.

Experiences within the ABV project

When young people use OpenSim for the first time they are very excited about the tool and its features. The partners of the ABV4Kids project recommend starting with an introduction in OpenSim and its basics such as creating an avatar, moving and communicating so that students get a first orientation. Due to the fact that creating objects is difficult some students lost the interest in this feature. So it is recommended that students who are very talented or committed in creating objects

³⁷ <http://www-e.openu.ac.il/>





are taught separately. Within the ABV4Kids project some very talented students managed creating their own buildings and inventory.

At first glance virtual learning environments don't have a clear aim or purpose for young people unlike for example online games. When working with young people in 3DVLs it is important emphasizing a firm goal which in case of the ABV4Kids project was sharing experiences and knowledge with students from other countries about the overall topics of violence in schools, bullying, racism and xenophobia. The partners introduced students in form of presentations to the overall project topics. OpenSim is a great tool providing the technology students can share their knowledge or information about their work in form of movies, PowerPoint presentations and posters. Young people are able to improve their ICT skills while using the presentation tools which can be integrated in OpenSim, e.g. learn how to create a PowerPoint presentation, creating and formatting text, creating movies or using Photoshop. 3DVLs offering the space sharing different presentation forms in a playful and exciting way. Like in real live presentation can be given while oneself in form of an avatar is speaking. Young people feel more honored when they get the opportunity publish the work in front of an international audience but around the same time they feel less pressure because it's a virtual audience they have to deal with.

Summarized the partners mainly made positive experiences with using OpenSim for working with young people. Teachers as well as students were very enthusiastic about the idea of being able to communicate with other teenagers all over Europe in form of an own avatar and sharing information and knowledge. In order to avoid a fall of the intercultural communication between the young people within the 3DVL the partners recommend that students from different countries work together on a project such as a PowerPoint presentation or a poster so that they have to exchange their ideas and communicate to achieve a good presentation they are satisfied with. An ongoing and continuous communication between young people from different countries leads to an improvement of language skills which is a clear advantage and reason for schools using 3DVLs in an intercultural context. Young people with lower developed language skills can rate international communications as a barrier but it should be seen as a chance improving language skills.





Due to technical standards 3DVLs require the partners faced some challenges during the ABV4Kids project. It is essential that a sufficient internet connection and computer are ensured. If young people are not able to work properly within an 3DVL from the beginning on they lose the interest very fast. It is recommended cooperating with ICT or IT personal e.g. when working together with schools who can help solving problems with special hardware requirements or local firewalls to minimize the risk of failure. A good functioning of the 3DVL used must be guaranteed from the beginning on. Young people having grown up with digital technologies like computers, the Internet or mobile phones are considered to be “digital natives” and are expecting fast use of modern technologies. The ABV4Kids partners provided a portable OpenSim program that allowed students to run OpenSim from a portable USB stick without having to implement OpenSim on their PC. Alternatively, they provided the program as a download together with a detailed guideline on how to copy the program to an USB stick and run it from their won PC. All students who used the ‘OpenSim portable’ managed to run OpenSim without any problems.

General recommendations resulting from project’s experience:

- Sessions should be planned very carefully and should be clearly structured.
- Presentations, workshops should be tested before a meeting to minimize the risk of failure.
- The agenda of a meeting/educational session should include different forms of activities e.g. mini lectures, discussions, poster presentations, informal talks etc.
- At initial stage setting unambiguous aims for users to achieve/establishing simple tasks and gradually increasing the level of difficulty
- Clear and indubitable distribution of tasks among the young people involved
- Issues should be related to every day’s experiences of young people and not having „theoretical“ character
- „Informal“ activities (e.g. parties) are very attractive for participants





- Regarding intercultural education and teaching: flexibility in terms of establishing dates and hours of official meetings and extend meetings to late afternoons and evenings

The team from the Open University of Israel conducted a small evaluation research in order to evaluate the effect of the project. A self-report questionnaire was forwarded to students participated in the ABV project including questions e.g. on satisfaction with participating at the project or effectiveness of the project in helping them deal with cyberbullying which was the main topic they dealt with during the project. Responses to all statements were on a Likert scale, from 1 (totally disagree) to 5 (totally agree). The table shows the average score of the pupils.

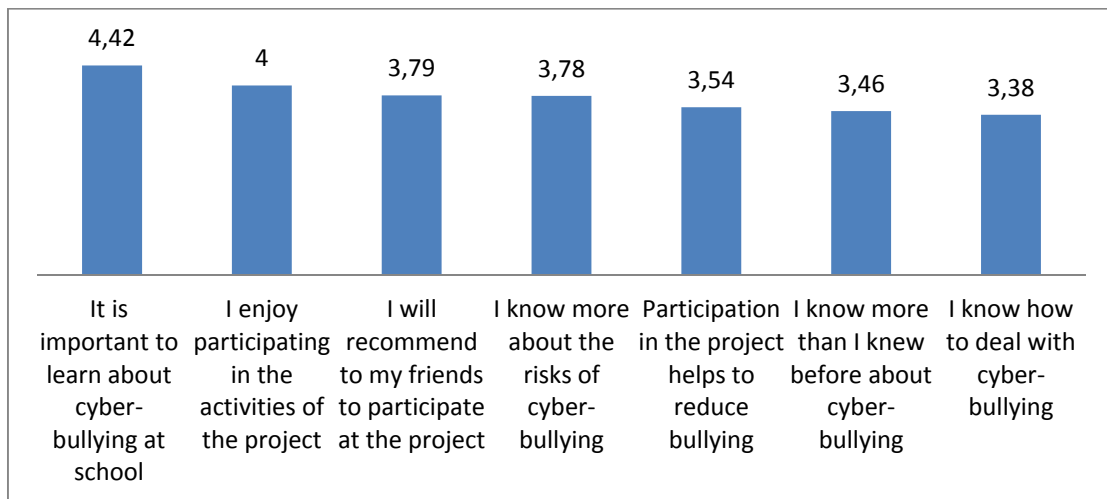


Table: Average score of the pupils' attitudes toward participating in the ABV project (n=24).

Students also reported that they enjoyed their participation in the project. 79% of the respondents agreed or strongly agreed that they enjoyed participating in the project (mean 4.00, S.D. 1.02) and 58% wrote that they would recommend to their friends to join the project (mean 3.79, SD 0.98). 52% (mean 3.78, SD. 1.13) of the respondents wrote that as a result of the project "they know more about the risks of cyberbullying" and 62% agreed with the claim that they "know more than before





about cyber-bullying" (mean 3.46,SD. 1.56). However only 42% of the respondents (mean 3.38, SD. 1.10) reported that as a result of their participation in the program they know more about how to handle cyberbullying. This means that, according to the pupils who participated in the project, the project provided the learners with a fun and exciting place for learning, enriched their knowledge about the subject, but didn't supply enough tools to deal with cyberbullying. No differences were found between girls and boys in the attitudes toward participating in the project.

Practical issues

Technical issues

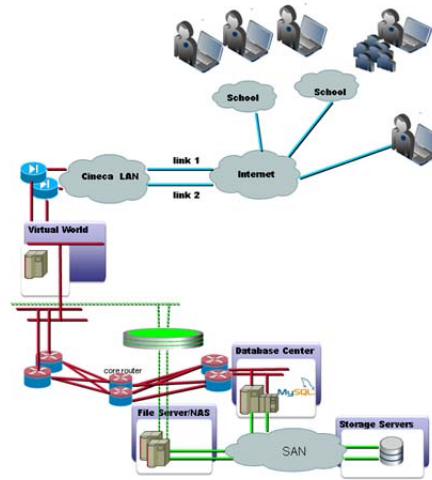
The Technological infrastructure

Most of the services available in the Internet are web based; this means that on the client side you need just a PC with a browser and the network configuration required to access this kind of services uses well known ports and protocols. The OpenSim virtual world is not a web based service. The use of a virtual world environment requires a set of centralized services and a client application running on every PCs of the users connected to the virtual world. The interaction in the virtual world is by means of an avatar that can do a lot of activities: communicate, walk, fly, teleport and build through the client application.

The centralized services

The architecture of the services is based on a front-end application server running all the related OpenSim Services (OpenSim, Robust, Voice, Groups,..) and a back-end for the database service. We use facilities offered by CINECA datacenter that offers a scalable and robust infrastructure.





After two years of the project life we can consider the server setup and configuration stable. The two days international conference held in the ABV4KIDS village is a confirmation.

The OpenSimulator software is still considered an alpha software so it's possible that problems occur under specific use conditions and contexts and this is the kind of problem we had to face owing to a configuration change in our virtual environment in the early stage of the project.

We started the implementation of the ABV4KIDS village by adopting a well known configuration implemented in a former project (Avatar@school project); with the growth of the village, the need of more "space" was satisfied by adding more islands to the grid. A buggy library in this configuration caused crashes that made the island unstable and in a case unusable when a lot of avatars were interacting with the server at the same time. As an alpha opensource software this is the kind of problems that can occur.

The OpenSim is based on a set of services that communicate, so a careful analysis was required for identifying the conditions causing the crashes and we found out an alternative setup that avoided the buggy library and then we restored the OpenSim to the normal operation till the end of the project. The time required for solving the issue did not affected the scheduling of the activities for





the project. If no workaround were available, the options were to rollback to a working configuration or in the worst case find an alternative technology.

Despite the fact that we can use the same SecondLife client application to login OpenSim, OpenSimulator is not SecondLife, so there are not exactly the same functionalities available on OpenSim. People that used SecondLife could expect OpenSim behaves in the same matter but this is not always true.

The Client PC and the Network

In order to run the client application on the PC, skills in installing, configuring a software application on a personal computer are required and the hardware PC must meet a set of minimum requirements. The installation of an application on a PC requires the privileges for performing such operation.

On the network configuration side the interaction between the client application and server is on specific ports and protocols that need to be enabled and the available bandwidth must meet minimal requirements.

Typically firewalls are configured to allow only web traffic and in school networks such limitations can be even more restrictive and only a set of authorized sites are allowed. Moreover firewall can be both at the network level and at the PC level and both need to be properly configured. To support these operations the technological partner provided technical guides for the schools with detailed instructions and supported for troubleshooting. Even if the hardware requirements are met from most recent PC, in some cases, we found outdated PCs.

Most of the problems faced in the schools in order to enter the ABV4KIDS village were in changing the firewall configuration in order to enable the connections to the OpenSim environment, part of the problem was to get the authorization to add the OpenSim server among the list of authorized sites and then the implementation of the configuration on the network devices for granting the





traffic for the ports and protocols required. When this kind of change was not possible, the project partner hosted the classes at their premises.

The configuration of the client application (SL client) can be tricky because the default configuration of the software connects to the SecondLife and you need to change manually a parameter. The portable version of the client application is a workaround that helped the phase of running the client application without the need of installing and configuring it.

The presence of skilled technical staff at the schools is important; sometime the management of the network is outsourced and then the implementation of policy changes required and extra effort. For entering in the ABV4KIDS village from home, some students and teachers installed the client application in home PCs. In this case some of them didn't succeed because of the lack of the minimal skills to perform the task or because not able to change the home firewall. In this case the collaboration of skilled classmate solved the problems.

OpenSim is a synchronous environment where avatars interact in real-time and this requires a minimum guaranteed bandwidth end-to-end from every PC connected to the server. In case a user is connected to the server from a place with limited or congested bandwidth, you can experience several kinds of problems: the world is not loading properly, your avatar is not well visible by other users, you cannot load multimedia content and in the worst case you are logged off. This kind of problems could occur when multiple PC are connecting to the OpenSim Server from the same limited network connection: i.e. from a lab in a school. In this case the solution is to connect only few PCs according to the available bandwidth. Another typical scenario is a PC connected to the Internet through a limited wireless connection (public WiFi hot spot or Internet key) and there is not enough bandwidth available. In this case the possible solution is to find a more reliable and robust Internet connection.

Running the client application

In order to interact with the virtual world you need the skills in the use of the client application and the technical guides and the training sessions performed had the goal to enable the use of the basic





and most advanced functionalities of the virtual environment. The average skills achieved by people allow them to do the basic interactions, communicate, fly, teleport and customize avatar appearance; only most motivated people achieved most advanced skills that allow them to build and customize the environment. Among this second class of users there are several students from schools who are most used to interact with technology and use this kind of environments and found the project engaging.

The technical support

According to this experience technical support is fundamental for all the life of the project. In the early phase, technical support is required for helping in the installation and configuration of the client software application and network configuration. In the further steps the main activities of the technical support are inworld for building and using the facilities in the 3D environment. Technical support expertise is then quite heterogeneous:

- knowledge of the intallation and management of applications on different operating systems (Windows, Mac);
- networking for firewall configuration at the PC and network devices level;
- application level for the interactions and building within the virtual world

All of them are necessary and important for properly supporting the project.





Working with OpenSim

How to prepare a workshop of other activities in a virtual world?

When preparing the actual course it is advisable to consider the recommendations outlined earlier in this chapter (cp. box 2). Try to make use of the advantages and affordances 3D virtual worlds provide and also consider their limits. Do not explicitly focus on technology and the “cool factor” of using a hip virtual world such as Second Life. This will certainly attract users but the fascination of using a new learning environment alone will not do. Students will only continue attending your course when you provide a learning environment that meets their needs and expectations and that promotes effective learning. So, focus on your students` requirements, try to anticipate problems and challenges that may come up and reserve some time for adequate training and support.

For your course itself Second Life provides various interesting features that help supporting the teaching and learning process. In your course you can for instance include *PowerPoint* presentations. In a visually-oriented learning environment such as Second Life this is an interesting option that also helps making your course more vivid. The video tutorial “How to make a PowerPoint in Second Life – tutorial”³⁸ outlines the basic working steps.

Another interesting option is the use of *audio or video streaming* that you can upload and incorporate in your course. The article “How to show a video in Second Life”³⁹ provided at the Second Life Wiki introduces in the basics. Video tutorials that introduce in how to play movies and web pages on your land in Second Life are provided in the “parcel media” section⁴⁰. An introduction in how to include audio files in Second Life is given in the Second Life Wiki article “Overview of Music and Audio in Second Life”⁴¹

³⁸ Video tutorial: “How to make a powerpoint in Second Life – tutorial”.

<http://www.youtube.com/watch?v=9gA8kp-vbGo>

³⁹ http://wiki.secondlife.com/wiki/How_To_Show_Video_in_SL

⁴⁰ http://wiki.secondlife.com/wiki/Video_Tutorials#PARCEL_MEDIA

⁴¹ http://www.simteach.com/wiki/index.php?title=Overview_of_Music_and_Audio_in_Second_Life





One relatively new option in Second Life is the use of *voice chat*. Made available to Second Life users as an optional part of main Second Life Viewer in the in August 2007 voice chat may help facilitating interaction and discussions between in the classroom. The Second Life Wiki dedicates the section “Voice Mentors: Getting Started with Voice”⁴² as well as several video tutorials⁴³ to the use of voice chat.

Recently there have been attempts to adapt complex learning management systems to Second Life. One very promising product is Sloodle⁴⁴ that integrates the Second Life environment and the Moodle learning-management system.

If you want to hold an event you have to consider that the numbers of users accessing on location in Second Life at the same time is restricted. For a whole island the maximum number of users is around 50, for a single classroom the number is considerably lower. However, with an appropriate capture/broadcasting software you can broadcast your course live from Second Life to an external web site and thus to an almost unlimited audience. Vice versa, it’s also possible to stream video into Second Life. An article in the Second Life knowledge base⁴⁵ introduces in both streaming into and broadcasting from Second Life.

⁴² http://wiki.secondlife.com/wiki/Voice_Mentors:_Getting_Started_with_Voice

⁴³ http://wiki.secondlife.com/wiki/Video_Tutorials#VOICE_CHAT

⁴⁴ <http://www.sloodle.org/>

⁴⁵ <https://support.secondlife.com/ics/support/default.asp?deptID=4417>





Conclusions

Second Life is one outstanding example of a new generation of 3D virtual worlds. Neither the concept of Second Life nor most of its features are new. It rather is the latest – but certainly not the final – step in a long evolutionary process that led from first text-based MUDs over MMOGs to today's Metaverses, 3D Web and Web 2.0 applications. Second Life combines many elements and qualities of previous virtual worlds, online games, social-networking sites, user-generated content, the WWW and different communication technologies. What makes it different from many other rather game-oriented is that it is completely free of a publisher-imposed narrative. It neither has a given plotline or setting, so that users have the freedom to use Second Life in the way they want.

It seems as if many, if not the majority of users, does not necessarily make use of this freedom they have. Rather there is a striking resemblance to the physical world with users who do not only re-create virtual counterparts of real-world sights, cities and other facilities but do also impose their self-created virtual settings the physical, cultural and temporal limitations of the real world. Several studies suggest that the social impact of virtual worlds such as Second Life is wider than one may assume. For instance qualities users acquire online such as confidence or insecurity can affect one's behaviour in the real world, often without awareness. There is also evidence that suggests that people's self-representations in an online environment have an impact on their behaviour in real life, the so called „Proteus Effect“.

As we outlined in this chapter in recent years Second Life has attracted an increasing number of educational initiatives universities, colleges, schools and other educational institutions. There are various educational uses of Second Life some of which we mentioned in this chapter such as distance education, training and skills development, role plays and simulations or language teaching. In the meantime there are numerous resources for educators using Second Life such as video tutorials, manuals, list servers and online communities. As we demonstrated there are several features that make Second Life interesting for educators. Apart from enabling students to interact with their avatars in a 3D environment Second Life allows educators to incorporate several applications that are





useful for holding courses such as PowerPoint presentations, video and audio files, Second Life adaptations of learning management systems such as Sloodle and even voice communication.

In spite of the undeniable potential Second Life has, there have been recent critical voices saying that Second Life has been overhyped and overestimated. Indeed, statistics published by Linden Lab⁴⁶ suggest a slowing growth rate in terms of new registrations after a peak around the end of 2006. Following the findings their study, the Yankee Group (2007⁴⁷) concludes “that the hype surrounding Second Life is considerably bigger than the virtual world's real-life relevance.” “Despite near-continuous coverage in the popular and business press, Metaverses like Second Life are experiencing slowing growth and limited impact because of the tethered nature of their virtual world experience”.

However, there are studies that suggest that the failure of many projects in Second Life may be due to the fact that many companies build on the “cool” factor of Second Life projects and focus too much on technology, while at the same time their projects lack of clear objectives and a limited understanding of their target groups’ requirements (Gartner, 2007⁴⁸). Indeed, evaluation studies of courses held in the Second Life environment revealed that for educational purposes Second Life can be promising, provided educators consider the requirements of their user groups as well as the potentials and limits Second Life has. So, sometimes “the condemned live longer” and probably in spite of recent critical voices it is too early to bury the idea of 3-D based virtual world, especially in the field of education.

⁴⁶ http://secondlife.com/whatis/economy_stats.php

⁴⁷ http://www.next-gen.biz/index.php?option=com_content&task=view&id=7343&Itemid=2

⁴⁸ <http://www.gartner.com/it/page.jsp?id=503861>





Resources

1. Miah, A. & Jones, J. (2011) Virtual Worlds, in Barnett, G. Encyclopedia of Social Networks, SAGE, <http://www.andymiah.net/wp-content/uploads/2011/09/MiahJones2011VirtualWorldsSAGE.pdf>
2. Hype Cycle for Emerging Technologies, Gartner Research, August 2008, <http://www.gartner.com/it/page.jsp?id=739613>
3. Getting Real Work Done In Virtual Worlds, Forrester Research, January 2008, <http://www.forrester.com/Getting+Real+Work+Done+In+Virtual+Worlds/fulltext/-/E-RES43450?objectid=RES43450>
4. Virtual world, Wikipedia, http://en.wikipedia.org/wiki/Virtual_world
5. Virtual reality, Wikipedia, http://en.wikipedia.org/wiki/Virtual_reality
6. Encyclopedia Britannica (online), <http://www.britannica.com/>
7. Joe Sanchez, Implementing Second Life: Ideas, Challenges, and Innovations, Chapter 2: A Social History of Virtual Worlds, February/March 2009, Library Technology Reports, <http://www.techsource.ala.org>
8. Stephen C. Bronack et al., Designing Virtual Worlds to Facilitate Meaningful Communication: Issues, Considerations, and Lessons Learned, Technical Communication Journal, August 2008, ISSN 0049-3155, <http://www.stc.org/publications/technical-communication>
9. Richard A. Bartle, Designing Virtual Worlds, New Riders Publishing, 2003, ISBN: 0-1310-1816-7, <http://www.amazon.com/Designing-Virtual-Worlds-Richard-Bartle/dp/0131018167>
10. Maged N. Kamel Boulos et al., Designing for learning in 3-D virtual worlds: the University of Plymouth Sexual Health SIM experience in Second Life, http://www.researchgate.net/publication/230674148_Designing_for_learning_in_3-D_virtual_worlds_the_University_of_Plymouth_Sexual_Health_SIM_experience_in_Second_Life
11. Doug A. Bowman et al., An Introduction to 3-D User Interface Design, http://eprints.cs.vt.edu/archive/00000548/01/3dui_presence.pdf
12. Sara de Freitas, Serious Virtual Worlds, JISC, <http://www.jisc.ac.uk/media/documents/publications/seriousvirtualworldsv1.pdf>
13. David Mallon, Virtual Classrooms: Facts, Practical Analysis, Trends and Provider Comparisons, Bersin & Associates, 2010, <http://www.bersin.com/practice/Detail.aspx?id=13465>





14. John Kirriemuir, Zen and the Art of Avatar Maintenance, Virtual World Watch, 2010,
<http://www.virtualworldwatch.net>
15. 3-D immersive virtual worlds in higher education: An Australian and New Zealand scoping study report, 2010
[http://www.academia.edu/530936/3D immersive virtual worlds in higher education An Australian and New Zealand scoping study](http://www.academia.edu/530936/3D_immersive_virtual_worlds_in_higher_education_An_Australian_and_New_Zealand_scoping_study)
16. 3D Learning and Virtual Worlds, Xerox white paper, 2009,
<http://www.xerox.com/businessservices>
17. Ross McKerlich, Virtual Worlds for Learning: An Analysis in the Use of Immersive Environments for Training, Brandon Hall Research, 2007,
<http://brandon-hall.com/publications/virtualworldsanalysis/virtualworldstoc.pdf>
18. Karl Kapp and Tony O'Driscoll, Learning in 3-D,
<http://www.learningin3d.info/#/about-the-book/4536558819>
Web site accompanying the book "Learning in 3-D", <http://www.learningin3d.info>
19. Educational Uses of SecondLife (online video),
http://www.youtube.com/watch?feature=player_embedded&v=qOFU9oUF2HA
20. Ahmad John Reeves and Shailey Minocha, Relating Pedagogical and Learning Space Designs in Second Life, The Open University, UK, 2011,
<http://www.igi-global.com/chapter/relating-pedagogical-learning-spacedesigns/52391>
21. Zen and the Art of Avatar Maintenance, http://www.silversprite.com/?page_id=491
22. Virtual Reality website, <http://www.vrs.org.uk/virtual-reality/>
23. Virtual Worlds: 20+ Tools for Creating 3D Graphics and Environments,
<http://mashable.com/2008/07/10/tools-for-3d-creation/>
24. Designing Virtual Worlds Bibliography, <http://mud.co.uk/dvw/bibliography.html>
25. 3-D virtual worlds list, <http://arianeb.com/more3Dworlds.htm>
26. Virtual World Watch, http://www.silversprite.com/?page_id=353
(<http://www.virtualworldwatch.net>)

