Chapter 12
Collaborative Learning in Virtual Environments

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12.1 Introduction

John is hurrying down the corridor, as he does not want to arrive late to his course again. The last time he went to "Arabic for Beginners," he barely got a seat, so this time he left work a bit earlier than usual to arrive on schedule. He opens the door and enters the room: a modern place with a whiteboard, multimedia equipment and a beautiful view of the city skyline. He enters the room, his gaze travels around him and he is startled, for every space is already taken. But no! There is one seat left – right next to Lisa. This time, John is really lucky. Lisa is quite a nice bunny he often took a glance at in class. With her huge plushy ears, her little black nose and her strong white fur, she is quite a sight. This might turn into a great evening for John.

But wait a minute!

White rabbits in Arabic lessons?! That sounds quite like a scene from Alice in Wonderland or a weird dream. But it is not. It is a description of a serious education event that takes place hundreds times in the virtual world of Second Life. Lisa and John are only two of the attending avatars – their virtual selves – at an e-learning course. They all sit at their personal computers at home or at the office and interact, in this example, with their teacher who is seated somewhere in Dubai. They all use the chance to learn from a native speaker while staying in their home cities of Berlin, Prague and Madrid.

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Looking at this example, at least four interconnected issues emerge:

- The learners attend a learning session independent of their location.
- They benefit constantly from an expert whom they would have had to go without if there were no connection via a virtual setting.
- They are a part of a group of specialised learners that possibly would not have congregated if dependent on meetings at a fixed place in the physical world.
- Some of them seem to be part-time learners, who also pursue a profession.

These observations are associated with the paradigm of lifelong learning: nowadays, lifelong knowledge acquisition is regarded as an important component in occupational careers. Professionals are encouraged to control their learning efforts autonomously. From the increasing demand for specialised skills and flexible knowledge acquisition follows an increasing demand for flexible learning settings that facilitate self-directed learning. With regard to this ascending demand, the Department for Educational Sciences at the University of Bielefeld in Germany initiated the project E-Learning 3D (EL3) in 2007. The project was assigned to develop a virtual learning environment (Fig. 12.1) in which students as well as lecturers could interact without being actually on the campus. It was expected that such a learning environment could serve as a complementary component of the university's schedule of lectures.
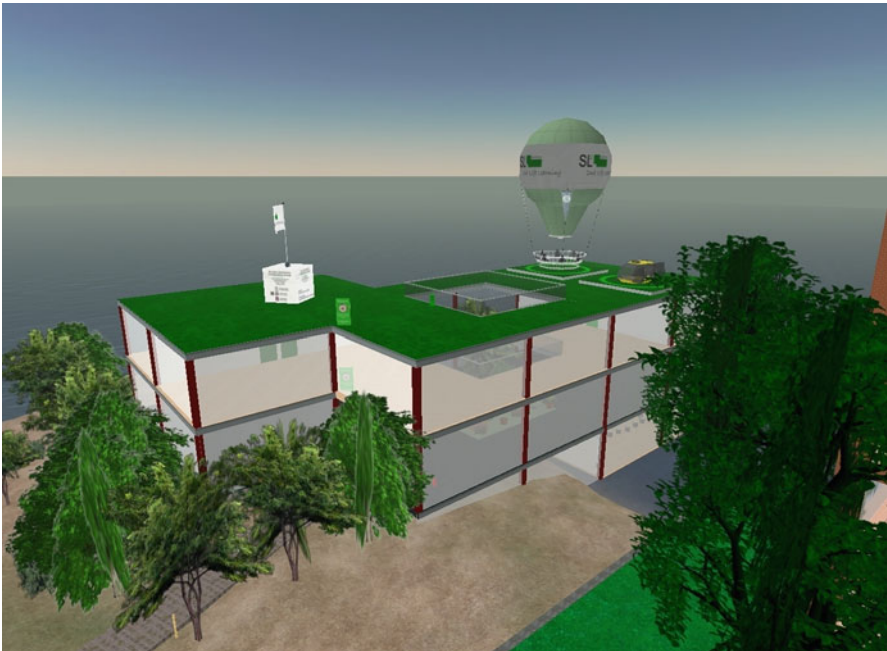
Fig. 12.1 The E-Learning 3D campus in 2007

The project EL3 chose the virtual world Second Life (SL) as the infrastructure for the establishment of the required learning spaces. SL is an online-based system that allows the users to move and act in a seemingly three-dimensional space. At the outset of EL3, Second Life was a ubiquitous phenomenon across different media. Today, though the medial omnipresence of SL is gone, the number of users is nonetheless still rising. Worldwide, 18 million participants are registered for the multi-user virtual environment (Linden Lab 2009). As the worldwide web evolves to the third dimension, EL3 tries to evaluate the potentials and possibilities of multi-user environments for learning purposes. Furthermore, it designs scenarios and best practice models for the use of these environments. This article covers the genesis and decisions made during the process as well as a description of the employed and adapted learning environments and tools. A learning environment is thereby understood both as a compound of knowledge that is organised according to didactic principles and as a setting designed according to didactic principles in order to facilitate knowledge transfer and knowledge generation between persons (Swertz 2004, p. 27).

12.2 Aims and Genesis of the Project

The project was based on the idea that students are increasingly receptive to self-directed learning, inter alia due to the intense use of electronic learning media. Thus, it seems to make sense to shift a part of the traditional course programmes of universities into self-directed learning phases. Moreover, there are a rising number of part-time students who work alongside or are constrained due to personal reasons (e.g. parenthood). They maintain a day's schedule, which resembles that of long-distance learners. There also emerges a demand for courses that are independent of time and place, i.e. that allow participation outside of the walls of a university (Schulmeister 2005, p. 240).

The aim of the project EL3 is the scientific evaluation of the virtual world Second Life as a learning instrument and the creation of a direct benefit to the students. As a main outcome of the project, a large virtual campus was created. It facilitates communication on the background of various room structures, which are equipped with several virtual media-like video screens, podcast players and interactive notice boards. The project team initiated and offered lessons and classes in auditoriums on the virtual campus. Likewise, students were counselled in virtual meeting rooms (E-Learning 3D 2009) (Fig. 12.2).

Apart from the technical design, the project is concerned with the formulation of didactic concepts in terms of the utilisation of virtual environments. By conducting seminars and developing and collecting learning tools in SL, the EL3 team created a base for critical reflection that rests upon the results of continuous development and adjustment of the virtual study programmes. Associated with the theoretical work, the EL3 team collected and analysed empirical data that sheds light on the potential of virtual worlds as learning environments.

Currently, the project starts the general implementation of virtual environments as a standard tool for academic seminars at the Bielefeld University.

Fig. 12.2 A classic lesson at the EL3 lecture hall

From a pedagogical perspective, SL offers a wide range of possibilities for the development of virtual learning settings. First, there is the sensation of staying in a three-dimensional room with others – designed analogously to rooms in the physical world. The adoption of the room metaphor allows an easily comprehensible way of synchronous interaction with the other participants. The similarity of SL communication and everyday communication seems to allow a high degree of emotional involvement of participants. Second, the learners can connect external web 2.0 applications like wikis and blogs with SL. Second Life combines a great variety of learning activities: users can watch clips in SL, they can read online articles on their particular topic in SL and discuss afterwards and they can illustrate ideas and concepts by building three-dimensional objects in Second Life (Mersch 2008).

12.3 Underlying Theoretical Assumptions

The project EL3 follows the assumption that interactivity among learners fosters active learning. In contrast to the approach of instructional design, by which learning is organised linearly, task-oriented EL3 proceeds from the constructivism perspective on learning: learners are active participants in the process of knowledge acquisition. They process knowledge on the background of their personal experiences, i.e. they structure it and they modify it. These assumptions are suitable to lead the design and the cultivation of a virtual learning environment. Inter alia the following goals were (cited in Pivec and Dziabenko 2004, p.18): "to provide an experience with the knowledge-construction process", "to provide experiences en-

couraging appreciation of multiple perspectives", "to embed learning in realistic and relevant contexts" and "to embed learning in social experience".

In this respect, the EL3 project operates with the following definition of collaborative learning: a group of individuals communicates and operates jointly in order to acquire and generate knowledge and hereby the group follows a collective aim of knowledge acquisition (Wessner and Pfister 2007, p. 22).

Three styles of collaboration can be distinguished: generic, spontaneous and intended collaboration (cf. loc. cit., p. 26). Second Life allows the accomplishment of each of the three styles. Generic collaboration comprises activities in a digital learning environment that are not directly connected to learning sessions, e.g. the contacting of other participants. In SL users can contact each other via voice chat as well as text chat. Spontaneous collaboration refers to learning activities that are a part of a course but not limited to this set of learning sessions. In SL, this applies to the function that allows writing messages to members of a certain group. Intended collaboration refers to learning activities that are bound to a certain point of the course structure. This holds, for example, in group work when the learning facilitator determines the size of the group, the duration of the group work session or when he hands out a set of instructions and documents as a basis of the group work (cf. loc. cit., pp. 26–29).

As shown above, Second Life as a computerised analogue of the physical world that surrounds us is the basis for the learning sessions offered by the project E-Learning 3D. This is mainly due to the potential of SL as an extension of learning activities in the physical world. The possibilities of collaboration in SL go beyond the scope of traditional learning activities in one particular aspect: it releases learners from physical constraints. These constraints usually bind the perception of collaborative learning experiences to encounters of a learner with other learners that happen at the same tangible spot.

It is assumed that virtual worlds like SL are additional contexts in the world we live in. Walber (2008) postulates that a distinction between real and virtual worlds is untenable. Users are able to incorporate these additional contexts as new parts of their reality (loc. cit., p. 75).

Therefore, users perceive the surroundings in SL and in similar Multi-User Virtual Environments (MUVEs) as "real". This includes the perception of social presence, which is due to the simulated physical presence in SL. Each user is represented by an avatar, his virtual agent, and via his avatar he can interact with other users, meaning he can communicate via text input (chat), talk and act towards other persons in the virtual environment. The avatar can be seen as an additional part in the personality of the user, of course still controlled by the person who it represents (Graeßner 2008, p. 2).

Furthermore, the sensation of immersion can attach the users to SL. The effect is often ascribed to virtual worlds and can evolve when a user engages, absorbed in thought, with the simulated environment. The user then blocks out his actual surroundings and focuses on the "in-world" activities (Heeren 2009, p. 254).

Products that are created by users of SL stay preserved even if their producers are offline. This continuance also nurtures the sensation of immersion (Schmidbauer 2008, p. 52).

Fig. 12.3 Social interaction in Second Life

Compared to text-based e-learning platforms, which usually are limited to a visual presentment SL bears not only the perception of a higher degree of social presence but also the advantage that it allows to address a whole range of channels of perception. With regard to the multichannel approach, it can be assumed that learners absorb information better when it is offered in several means of perception (Falk-Frühbrodt nd). Learning environments in SL should take into account this need for different channels of perception (Fig. 12.3).

Although the virtual collaborative learning experiences a leap by the implementation of Second Life, lecturers still need to consider traditional didactic principles when it comes to learning in that environment. A virtual world does not "automatically" function as a professional learning environment. The provision of space for learning does not necessarily ensure that collaborative learning does actually happen. Nonetheless, virtual buildings, rooms and places can be designed with a didactic intention as well as schools and universities in the physical world that can be designed with the same intention (see paragraph 3b "Learning Spaces of EL3"). Nonetheless, for collaborative learning to happen, it is necessary for people with a common orientation towards a topic to gather, in order to generate, distribute or receive knowledge. Also, it is essential that they perceive a physical or virtual proximity to other learners (Städtler 2008, pp. 207–216).

The Berlin model of didactics can serve as a perspective to discuss the process of collaborative learning, regardless of its emergence in physical or virtual reality. The model starts out from the idea that facilitators of learning act in a structured field of interaction in which certain decisions are to be taken concerning intentions, content, methods and media (Heimann 1965, p. 10),(Schulz 1965, p. 23). From this, it follows that when a facilitator prepares a learning session he can set his intended

learning objective, he can set the topic and he can decide about which ways to use to activate the knowledge transfer between the participants. He also determines which media to use to accomplish his learning objective, e.g. books, blackboard, computer, beamer or audio device. These aspects that are dependent on the facilitator can be defined as the facilitator's spectrum of decision-making (Schulz 1965, p. 37f).

To take suitable decisions, the facilitator needs to clarify the conditions that influence the learning situation (Heimann 1965, p.10). These determining factors concern anthropogenic conditions (the perception of the participants formed by disposition and previous experiences) and sociocultural conditions (the setting in which the learners are located during the learning session) – a general setup that is not controllable by the facilitator. These antecedents can be defined as spectrum of conditions (Schulz 1965, p. 36).

Within that didactic perspective, the space in which learning occurs can be seen as another condition of learning when it is allocated by higher authorities or when it is dependent on organisational guidelines as is usually the case in schools and universities. Consequently, the facilitator is not able to change such conditions by his didactic decisions (Swertz 2004, p.13).

The usage of a virtual world like SL turns this view upside down: unlike a physical learning space (e.g. a classroom or a library), a virtual learning space can be modified in a few steps by the teacher respectively facilitator.[1] By that, the learning space turns into a part of the didactic decisions, i.e. conditions that can be organised in a great measure by the facilitator (Swertz 2004, p.20).

Following this idea, Second Life can be didactically considered on two levels: first, within the physical world it serves as a medium that is used by an organiser of a learning session to foster a certain learning objective. Second, within the virtual world of which SL is part, the organiser of a learning session acts under the scope of his learning objective and takes decisions on content, methods and media inside of the medium Second Life (Fig. 12.4).

The decision to use SL as a medium for learning sessions generates a new spectrum of conditions that influence the learning situation. This spectrum is partly similar to the spectrum of conditions in the physical world (e.g. the intellectual competencies of the participants still play a role). However, the involvement with SL also entails specific conditions. For example, it becomes crucial to consider how familiar the participants are with the handling of the instruments of SL (e.g. the voice chat or the control of the avatar). A low familiarity with the medium can induce a disturbance of the knowledge transfer and generation. This would mean that it is not the intended content but the medium that becomes the topic of the learning session (Schulz 1965, p. 35). Therefore it can be required to either offer introductory lessons before applying SL or set the familiarity with SL as an entry requirement for participation.

Referring to the aspect of familiarity with SL, the team of EL3 decided to confront the participants preferably with didactic elements that are common in physical

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[1] A consequent application of this possibility is the rather versatile holodeck on the area of EL3 (see below).

Fig. 12.4 The usage of whiteboards in Second Life

face-to-face workshops and lectures. For example, the procedure in the virtual EL3 forum on further training corresponds with a conventional colloquium. Furthermore, it was agreed upon to choose mainly media in SL that originates from the repertoire of physical face-to-face events (like video clips or on-screen presentations). To avoid the "boredom factor" (Dearling 1992, p.58), which arises often in large groups, the length of presentations was limited. This measure was also due to the circumstance that the speaker does not receive the same feedback that he would receive in the physical world: the natural gestures, mimic and body language in general are missing. Thus, to reduce the likelihood of divagation, presentations in the EL3 forum were restricted to a maximum of 20 min, followed by a discussion that involved the audience.

Notwithstanding, such arrangements are still seen as variable, since the EL3 team assumes Second Life and the learning spaces within it as an experimental ground for didactic procedures in virtual worlds.

12.4 Deploying Second Life as Learning Environment

12.4.1 Fields of Action

In 2009, the EL3 team offered a course on the "Designing of Virtual Learning Environments" which took place entirely in virtual space. The course was part of the regular course catalogue for students of the department for educational sciences.

As the learning environment has a great impact on the learning process, the participants had the possibility to build their own learning environment. These environments reached from common classrooms, as we know them from daily work,

to treehouses high up in the clouds, to a setting at a lonely beach with a great sunset. After the phase of exploration and building, all participants reflected and discussed the learning areas on the basis of scientific criteria. Virtual worlds like Second Life offer possibilities for designing and building learning environments – a matter that is unfeasible on a campus in the physical dimension (Fig. 12.5).

Furthermore, the course was also aimed at the participants of the e-trainer qualification at the department. This qualification proceeded in modules and takes one and a half years to complete. The participants dealt with the question on how to didactically design and to realise online learning processes. During the first semester, the students learnt to handle modern e-learning platforms like Moodle, Elias and StudIP virtual worlds like Second Life. Within this phase, the focus is put on the usage and administration of such platforms, so that the students can later handle them as means for their own courses. In the following semester, the students dealt with the didactic and educational questions about e-learning and blended learning courses. In the final third of this semester, the students designed a course for the upcoming third module, in which they acted as e-trainer for other students of the department. After completing this part of the qualification, the students offered their results to all students at university as a regular course to practically experience what it means to conduct online lessons in virtual worlds and other modern e-learning environments. This phase is also supported by the lecturer, in order to ensure learning efforts and fruitful results for the e-trainers and their participating students. When the next qualification cycle starts, the new students can fall back on the results and locations that are built in virtual worlds by the preceding courses, improving these buildings or taking them as examples for their own work

Participants of two programmes for non-traditional students at the University of Bielefeld employed SL in order to build their own virtual representative rooms.

Within the framework of the programme "Women's Studies" (Frauen-Studien), a workgroup chose Second Life for their project work. Based on didactic considerations and theories, they started with designing a room at the E-Learning 3D area. During this phase, the participants were supported by the E-Learning 3D team, which organised and held the kick-off of workshops and advised them during the building and exploring phase. After some weeks, the students got familiar with the world of Second Life and they were able to build an area where the members of the programme could gather, talk and present their results to other interested parties. As a part of their project work, the students had to conduct a small scientific study. The group of Women's Studies students used the special opportunities of Second Life to conduct a qualitative study on the usage of virtual worlds for learning purposes. With the independence of time and place, they talked to people around the world. They also managed to establish contacts to other people involved in e-learning during their voyages in Second Life, which proved to be useful in order to strengthen their personal learning networks. The room and the findings of the participants were presented several times on occasions during official events at the university.

Members of the programme "Study for the Over-fifties" (Studieren ab 50) forged a study group that cooperates in SL. This programme is not limited to the Faculty of

Fig. 12.5 A learning environment designed by students

Educational sciences. These students can choose from many different courses distributed throughout the whole university programme. The Second Life group meets on a weekly basis to explore the world of Second Life and to become used to learning in virtual environments. They invite speakers from their fields of interest or visit cultural places in Second Life like museums or art exhibitions. They also travel to pleasurable virtual places like the Pyramids or the City of London to get a feeling for historical facts or the architecture of a certain time period. Furthermore, they also build up and design their own location where they can meet and talk to other participants of the study group.

This sort of collaboration proved to be helpful especially for older people, as they could easily attend lectures from their homes and need not come to the campus for their courses. Speakers from around the world were also invited, who often readily agreed on joining the meetings as they could lecture from the office desk with no need to travel to the University of Bielefeld. The broad learning experiences in SL reflect the deep interest of the members of the "Study for the Over-fifties" programme concerning virtual collaboration – and they do prove that e-learning and virtual worlds are not reserved for the young generation (Fig. 12.6).

Apart from lectures, presentations and workshops, the virtual campus was also used for consulting hours and meetings of study groups. This means that the students need not come to the physical campus and that these meetings could be held from a distance. However, contrary to the other projects, this idea was not adopted well by the students, as there were many concerns about security issues, i.e. the risk of

Fig. 12.6 Meet students at the area "Study for the Over-fifties"

being overheard (which in fact can be prevented by the use of the direct voice chat of avatars). Most of the students also preferred to meet their lecturers face to face, as there are some factors that are transported poorly by the avatar such as empathy and body language. Avatars lack most of the body language and facial expressions, but people tend to fall back on these resources when they talk about important topics like testing and grades. Another usage of the virtual rooms that were tested was the conduction of coaching sessions. For example, during a face-to-face seminar, a virtual office was employed to simulate an e-coaching. It appeared that the small size of the EL3 offices and the impression of its limited accessibility – there is only one office entrance for each office – foster the conversation on intimate topics, especially when the "one-to-one voice call" is in use (Heeren 2009, p.265).

Apart from these student-oriented fields of action, the project also organised several public education events in Second Life, which were most often attended by thirty to fifty avatars at a time. Starting in 2008, one series of events was the "virtual forum of continuing education" (Virtuelles Weiterbildungsforum) that took place on a monthly basis. The forum proceeded at the virtual lecture hall in Second Life. Its procedure resembled a conventional lecture in most ways. The project team invited speakers from the different fields of e-learning. During the two hours of the event, they could present their findings with the aid of charts and multimedia. Both scientists and practitioners followed the invitation and presented current results and trends from their field of work to the audience. After the presentation,

there was always room for discussing the topics. As a service, the forum sessions where streamed to the E-Learning 3D website, for those who could not attend the event in Second Life. Moreover, the sessions where fully recorded for later use and are retrievable at the project website in order to convey an impression of how a virtual forum can proceed. During recent years, more than fifteen notable speakers, and more than five hundred avatars, attended the virtual forum for continuing education.

In autumn 2009, "Island Day" (iDay) – a virtual conference – took place for the first time. On this day, educational institutions and universities from all over Europe were invited by the E-Learning 3D project to come together in Second Life to present their current proceedings and findings. All exhibitors were virtual inhabitants of the "European University Island" (EUI), an area especially reserved for educational institutions from Europe. By iDay 2009, twenty-two educational projects resided on the EUI. The event was open for everybody who was interested in informing oneself and to get in touch with representatives of the different projects on the island. iDay took place only in the virtual world of Second Life and was completely free of charge for any participants. Only a registration at the virtual world of SL and the creation of an avatar was necessary. The conference lasted about eight hours, with three parallel presentation slots throughout. With an average of fifty avatars at a time, about 200 people attended this first iDay. Due to the particular setup of the conference, there were very low expenses. As there were nearly no fees for rooms, buildings and equipment, most costs were limited to opportunity cost for the attending speakers. The organisation beforehand was done by the speakers themselves through social networks[2] (Fig. 12.7).

12.4.2 Learning Spaces of EL3

In previous years, the virtual campus of EL3 was subject to constant alterations. One benefit of a learning environment like SL is that one can replace buildings and grounds simply via mouse-click when a certain occasion requires a new setting. For example, one can use an area initially for a speaker-centred lecture and in a next step swap the building to facilitate the group work of the students. Advanced users can design and construct those components of a SL learning environment. In the following, this article presents a selection of learning spaces developed by the EL3 team.

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[2] http://islandday.mixxt.de.

Fig. 12.7 A conference in Second Life

12.4.2.1 Colosseum

This area resembles a traditional lecture room with whiteboard, presentation screens and benches for students. This place was constructed as one of the first buildings in 2008. It reminds the users of a familiar setting from the physical world. This place focuses on giving every novice user as much orientation in the virtual world as possible, which allows them to focus on the content of their lectures. In theory, the participants should not be distracted by unusual learning environments or eye-catching effects in this room. This area was the most frequently used area on the virtual campus, probably since most of the users seemed to feel attracted to such a simple structured learning environment (Fig. 12.8).

12.4.2.2 Skycenter

This facility hovers over the E-Learning 3D campus and at first sight it reminds us of a space station. The Skycenter contains a series of "theme cubes" – each of them a room with a certain didactic orientation. In each of these cubes there is the possibility to change the whole design and functionality without affecting the other cubes. Hence, the Skycenter can be used for several events or lectures at the same time. One example of such a cube is the so-called Philosophicum. It was designed

Fig. 12.8 The Colosseum – a classic lecturer hall

due to the need of a seminar on further education whose participants wanted to experiment with the Socratic dialogue method. The theme cube is characterised by its ancient Greek look: it is equipped with loungers, seat cushions, temple pillars and fire baskets that burn in the corners of the room. Every Avatar is offered a free toga at the entrance to further immerse oneself into the virtual place. Besides the Socratic dialogue, the comfortable-looking setting can also be used for group activities like brainstorming sessions or discussions. Another cube was designed as a didactic laboratory, where student and lecturers could experiment with new ideas or tools. This somewhat chaotic-looking area is filled with tools for communication, visualisation and feedback. Here also grow ideas for new three-dimensional models. The first instances of interactive presentations were also built and tested in the didactic laboratory. Moreover, the areas of "Study for the Over-fifties" and other study groups are located in the Skycenter (Fig. 12.9).

12.4.2.3 Conference Room

This place is concealed under water so that passersby do not easily see it. On principle, the conference room is accessible to all visitors of the EL3 area. However, an admission restriction can be enabled so that access is granted only to authorised users. This includes a barrier that hinders the spoken word passing across the

Fig. 12.9 The Skycenter on the EL3 campus – 150 metres above ground

walls of the room. In combination with the access restriction, this room is ideal for meetings and discussions that are not public. The room was constructed mainly for meetings of the EL3 team and partners. It is – like physical conference rooms – equipped with whiteboard and presentation screens. There are also means to view multimedia streams, and there are tools for collecting and preserving the results of meetings held in this room. The room was designed to be as flexible as possible, so the furniture and equipment can be removed to give space for 3D models or other room-taking activities (Fig. 12.10).

12.4.2.4 Holodeck

This is another special and very versatile area on the E-Learning 3D campus. Like in science fiction stories, this learning place can be altered by the touch of a button. Depending on the situation the lecturer can choose from a set of predefined learning scenarios that suit standard situations best. They can also design their own settings and save them for later use. Thus, a single area can serve the maximum amount of purposes and can be prepared for a quick change of settings.
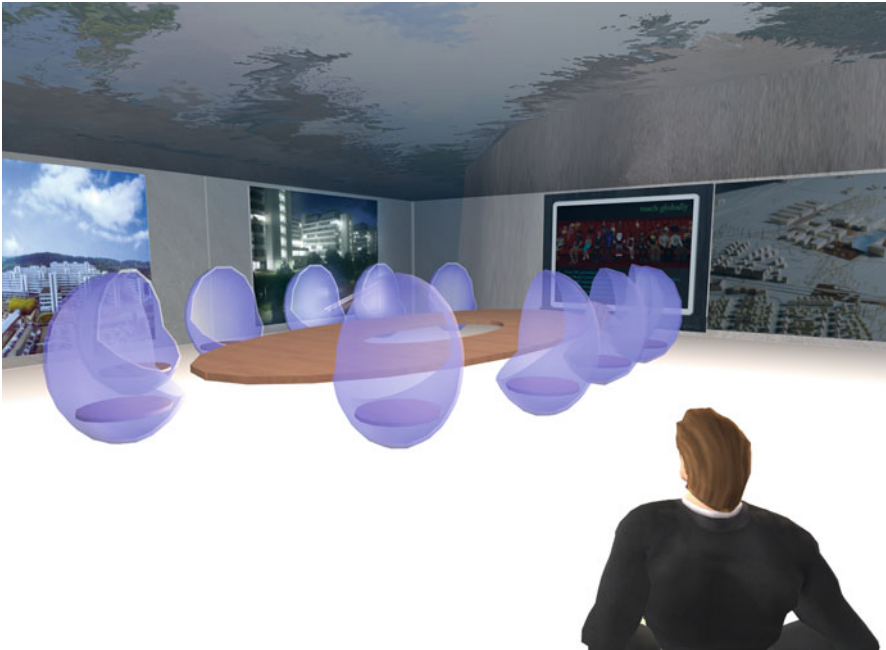
Fig. 12.10 A conference room on the EL3 campus

12.4.2.5 Representative Area

The ground floor of the EL3 main building presents a general view of educational providers and associations that are connected with the project. For example, posters inform visitors about the University of Bielefeld and the alumni association of the university (Fig. 12.11). Exhibitions from other activities at the university and other art projects can also be shown here, just like a short film festival.[3]

12.4.2.6 Counselling and Coaching Area

On the upper floor of the EL3 main building, the virtual offices of the EL3 team are situated. Each room is equipped with a desk and seats for the particular team member and his visitors. The offices are mainly used for consulting hours when a lecturer swaps ideas with participants of a seminar. They can likewise be employed for e-coaching sessions (see above) (Fig. 12.12).

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[3] For example, in 2008 the project E-Learning 3D presented a cinema show with short films of students on its virtual beach on the European University Island.

Fig. 12.11 A representative area of the EL3 project and his associated partners

Fig. 12.12 A counselling area on the campus

12.4.2.7 Informal Areas

These areas are designed for informal talks or group meetings. Examples on the
EL3 campus are a cafeteria at the beach and the "silent forest". Both areas are de-
signed with the focus of fostering a good mood for the users in order to support their
creative power (Fig. 12.13).

12.4.3 Learning Tools Adapted by EL3

There are a great number of means of presentation and communication in SL that
can be applied for learning purposes. The generation of social spaces in virtual
worlds in order to nurture and maintain interactions between the users is a task of
the pedagogical discipline. The same applies to the encouragement for the formation
of communities as manifestations of ongoing interactions (cf. (Pätzold 2007, p.7)).
The EL3 team, as part of Educational Science of a Faculty of Educational Sciences,
continually developed new learning spaces and examined a whole range of learning
tools that will be described in the following.

Fig. 12.13 An informal area at an giant treehouse

12.4.3.1 Sloodle

Every Learning Management System (LMS), software applications that support
individual as well as collaborative learning, has its strengths and weaknesses.
While the popular LMS Moodle shows inadequacies concerning its communication

opportunities and often needs to be combined with external applications, virtual worlds often lack the possibilities to distribute files and data properly. Sloodle is an approach to combine the strengths of both worlds. It was developed as part of an open-source project that tries to integrate the multi-user virtual environment of Second Life with the Moodle LMS. It provides an interface in both platforms and enables the EL3 team to use many Moodle features in the world of Second Life without leaving the virtual world.

12.4.3.2 Teacher Tools for Work and Collaboration

These are tools that come in handy for any lecturer in Second Life who wants to teach in a virtual world. As there are many different tools, only a few are named here that are highly recommended because "shopping guides" for SL tools can be found online . All these tools can be purchased at a very low price (about 20 dollars for a complete set) or are free of charge.

Fig. 12.14 A collection of learning tools

One of these tools is the "list of speakers" that proved to be useful during group discussions. Each participant who would like to speak simply clicks on a question mark that represents the tool. The name will be automatically signed on the list. Everybody can see this list and the moderator recognises easily who is the next speaker.

The Countdown Timer is a tool that can be used just as easily. During discussions or group phases, the lecturer can set an alarm. The timer displays a countdown for everybody in the room. At the end of the countdown, a sound also reminds the participants acoustically (Fig. 12.14).

After a session, there is often the need to get feedback. Here, the Feedback Boxes come in handy. This little tool can be placed at the exit of a room. Every participant can leave a note before leaving the room. The boxes also facilitate the distribution and collection of surveys at the end of a session. Afterwards, the lecturer can empty the box and examine the answers.

12.4.3.3 Visualisation Tools and Presentations

As a picture is worth thousand words, there is always a need for the audio-visual presentation of topics. Second Life allows a lot of ways to show charts, videos or other multimedia content. There are tools to get a quick and easy opinion image from the participants. Only a click is needed to vote and then a virtual object cumulates and shows the opinions as a pie chart or a bar chart. One can literally see how a mood or opinion changes as the objects alternate in the three-dimensional world.

Of course, there are many ways to show multimedia content to the audience. A classic tool is the multimedia board, which resembles a classic presentation screen. Here, images and charts can be presented, but also films and interactive websites can be shown (Fig. 12.15).

Fig. 12.15 The "Opinionater" – show your opinion by positioning your avatar

12.5 Challenges and Perspectives

The EL3 project developed a multitude of virtual learning spaces that turned out to be a support for traditional seminars as well as for the community of students that depend partly on distance learning settings. However, there are still a lot of challenges left. One of the greatest hazards is the technical problems and the dependency on Linden Lab, the provider of Second Life: to date, the system does not work totally hassle-free. Linden Lab is a commercial provider, so the general access to SL is free of charge, but the company charges fees for certain services in SL, e.g. for the upload of data and the occupation of virtual pieces of ground.

The commercial dependency on Linden Lab is also connected with copyright issues, e.g. the question in how far the company is legitimised to exploit inventions that users create within SL. Therefore, for universities and other educational providers, it could become worthwhile to launch their own virtual worlds on their own servers. By now, SL is confronted with competitors like OpenSim, which are programming systems that allow users to develop their environments using technologies that are attuned to their needs. Via intranet, these environments can be restricted to particular participants of learning sessions, so that they can work in "closed shops". Most importantly, OpenSim appears to be gaining increasing popularity since it is provided for free and since it is developed as an open-source project. The concept behind OpenSim includes the option to open a restricted network to external users if necessary: universities, for example, can connect their OpenSim server with the respective servers of other educational providers to create overall clusters between which participants can travel virtually. Educational networks could utilise this technology to connect their particular partners, whereby participants can benefit from the whole range of services offered by the network partners. Nonetheless, every partner of such a network retains sovereign control over its virtual learning environment since it can open and restrict access to each module of it anytime. Such a three-dimensional learning environment would be characterised by a high degree of openness and flexibility. It further saves the educational providers from the exposure of their know-how, i.e. the products and developments that are often expensively invented especially for the use in a virtual world.

Apart from the needs of educational providers that utilise virtual worlds, one of the main challenges is the practical application of such a learning environment: looking from the perspective of lecturers and students, the personal requirements of the users should not be underestimated. Although SL is a computerised environment, there is still a range of procedures that cannot be automated. The personnel expenditure for learning sessions in SL is comparable with the respective expenditure in physical environments and is sometimes even more complex. For example, in a usual session where a lecturer and a facilitator take action, there are associates who are responsible for the technical support, assistants sometimes care for the lecturer and, if required, another person records the event to save the discussions on video (Heeren 2009, p.260). The experience of the project E-Learning 3D has also shown that the use of an introductory lesson on SL in a face-to-face setting is necessary and that there is an ongoing demand for support during courses (Ojstersek 2008, p.297).

Fig. 12.16 The EL3 campus in 2010

Moreover, the acceptance of this new learning environment among students and lecturers can be a critical point that should be monitored very well. By now, it seems that SL is most suitable for learners that feature a high degree of media literacy and that are used to organise self-directed learning. One way to include learners that are not used to acting in virtual worlds is the adoption of learning settings that are known from the physical world (see paragraph 3b) (Fig. 12.16).

Trust is also an issue in SL: the identity of an avatar in Second Life cannot be doubtlessly associated to a certain person in the physical world. Although the user profile of an avatar can be assigned to a certain person, this does not verify that this person is in control of the avatar (Mersch 2008).

Apart from that, SL appears to be helpful especially for learning groups whose participants already know each other from face-to-face meetings, e.g. people that are connected via learning partnerships or learning networks (Graeßner 2008, p. 4).

Nonetheless, it generally appears that lecturers who aim to organise seminars in Second Life have to often be considerably convincing in order to attract greater numbers of students and to draw colleagues and superiors to their side. The acceptance of the web technology Second Life as a learning instrument appears to be far from being part of the mainstream (Shin and Kim 2008). One reason may lie in the enduring prejudice that regards acting as an avatar in an artificial world as playful, as lacking seriousness. One way to increase the acceptance of virtual worlds as learning environments can be the training of students as e-trainers for e-

learning settings like SL (see above). As a part of their qualification, these students themselves can organise small study groups so that the inhibition level for SL access can be decreased. Moreover, lecturers who work with SL are exceedingly required to explain the concept and the procedure of their virtual seminars in preliminary face-to-face meetings with interested students. Because virtual seminars are relatively seldom in universities, the idea and the surplus value behind those courses need to be as transparent as possible. Other than that, the fixation of this learning setting as a mandatory component of the curriculum of the different courses of studies would be a strong boost to the value of virtual classes.

In the near future, learning spaces will most likely be appreciably more interactive than today (Pätzold 2007, p.17). This task is complex. In addition to the technical components, didactic concepts for the use of virtual environments are necessary, as these will no longer stand isolated but will be a part of a greater network to come (Mersch 2008). The extensive possibilities of learning in virtual worlds will gain a prominent role in the future of e-learning, which calls for further investigations.

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Dennis Schäffer is currently working at the Faculty of Educational Science at Bielefeld University. From 2007 until 2010 he was one of the innovating and leading heads of the "E-Learning 3D" project in Second Life. The project was assigned to develop a virtual learning environment in which students as well as lecturers can interact without being actually on the campus in an rich 3D environment. Currently his main work is focused on international adult education, virtual worlds, personal learning environments (PLE) and the Social Web.

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