

Analysis and Research on Distance Learning in Second Life

Yangyang Sun⁺

School of Glorious Sun Business and Management, Donghua University

Shanghai, P. R. China

Abstract—As the representative of the platform of virtual reality on internet, Second Life attracts more and more attentions from educationalists and researchers. Based on analyzing Second Life's value in distance learning, the paper makes an intensive study of how to design distance learning environment in Second Life. Moreover, the paper analyzes the problems and future development of Second Life in its distance learning application. The paper will be a reference to the researchers who research on distance learning applications of Second Life, making contributions to Second Life's wider application in distance learning.

Keywords- Second Life; distance learning; virtual world

1. Introduction to Second Life

Second Life is a three-dimensional virtual world with integrated technologies of virtual reality and network communication produced by Linden Lab in 2003. Second Life provides a three-dimensional Modeling System with powerful functions and Linden Scripting Language (LSL) for programming. Users in Second Life, called residents, can make use of the 3D Modeling System to found various objects and use LSL to attach behaviors to these objects, achieving the recreation and development of real life in digitized virtual space.

Second Life has become the first virtual world attracting global users in the areas of business and education. Many colleges and universities have set up courses in Second Life to make students implement educational practice in this virtual environment which is similar to present world, such as Harvard University, New York University, Stanford University, etc.

2. Second Life's Value in Distance Learning

Currently, more and more educationalists find that Second Life has an extensive future in distance learning application and can be applied to diverse subjects' education, which is owing to its high value in distance learning.

2.1. Help to Accomplish Meaning Construction

Constructivism believes that proper learning situation can help students accomplish new knowledge's meaning construction, promoting knowledge to migrate [1]. Through making use of avatar, virtual scene, virtual events, etc, meticulous situation close to the real world can be designed, providing an environment of situated learning for students and helping learners to accomplish meaning construction successfully [2].

2.2. Narrow the Distance between Teachers and Students

⁺ Corresponding author.
E-mail address: dicky_sun@126.com

In the process of distance learning, transactional distance across the mental space and physical space exists between teachers and students. The new virtual environment and interactions that Second Life provides can simulate various behaviors of teachers and students and provide functions of text-based communication and real-time voice communication, greatly enhancing student-teacher interaction and effectively reducing the interaction distance.

2.3. Promote Social Learning

Text-based communication provided by Second Life for residents realizes the interaction among people. In addition, using LSL to add dynamic behavior to objects makes the interaction between people and objects and interaction among objects possible. However, in the form of real-world learning environment, the objective constraints weaken the latter two interactions. On the contrary, they are conducted smoothly and promoted effectively in Second life, building a real interactive space.

In the real interactive space supplied by Second life, learners actively get involved in social learning not only by watching and imitating others, but also through the construction of objects, role-play, communication, etc.

Moreover, a look, a movement, a facial expression of each avatar can pass information to others, to shorten the distance of space effectively and promote the spread and sharing of knowledge. Compared with the traditional distance learning which is only based on text and voice, this kind of communication which is based on text, expression and movement effectively enhances learners' social skills and promote their social learning from a new perspective.

2.4. Cultivate Creative Thinking

Since Second Life only provides land for residents, residents must create some distinctive things according to their needs, making it a good virtual world to train innovation. Residents can take advantage of 3D Modeling Tool to found virtual furniture, vehicles, buildings, etc, and attach scripts to objects according to their own preferences. Everyone hopes that the items they own are created by their selves. This sense of victory, superiority and satisfaction can stimulate the interest of learners and the ability to explore new things, encouraging residents to give full play to their imagination and creativity.

3. Distance Learning Environment Design in Second Life

In view of Second Life's remarkable educational value, it has become the virtual classroom of many universities who integrate Second Life into some of their courses. Some teachers even move the whole class into this virtual world. By researching on some distance education environments built by well-known universities, the paper explores the way of designing a distance learning environment in Second Life.

As a Web3D virtual learning environment, the distance learning environment based on Second Life is composed of five elements: learning situation, learning resources, supporting tools, learning community, learning activities [4]. Starting from the five elements, the design of Second Life-based distance learning environment centers on learners' autonomic learning and carries out specific analysis by combining Second Life's characteristics. Fig. 1 shows the model of distance learning environment design in Second Life.

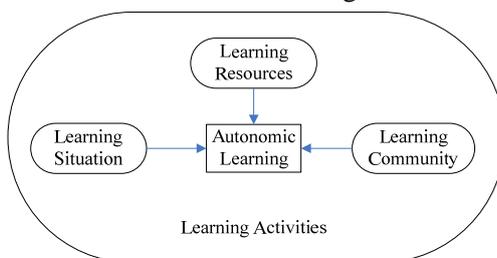


Fig.1. The model of distance learning environment design.

3.1. Build a Learning Community

Learning community is a group constituted by learners and assistants who often communicate, and share resources with each other in the learning process to complete certain learning tasks. Building a learning community is the first step of designing Second Life- based distance education environment.

Students and teachers can form study group first according to common interests and the principle of ability complementation. At the same time, common rules should be established to follow and group culture should be formed, establishing learning community ultimately.

3.2. Introduce the Problem, Create Learning Situation

Learning situation provides students with a complete and real problem background and starts teaching as a prop, producing learning needs for students and driving members in learning community to study autonomically. These issues introduced should be from the real scene in real life or some issues' background information which should arouse the research interest of students.

In Second Life's learning environment, learning situation in which learners will have an immersed sense can be presented by using virtual reality technology provided by Second Life to simulate the real scenario or by using multimedia provided by external link function. Fig. 2 is a virtual classroom created by using 3D Modeling System in Second Life.



Fig.2. A virtual classroom created by using 3D Modeling System.

The knowledge that members in learning community need to know can be presented statically or dynamically. In Second Life, static presentation is mainly achieved by Notecard and changing object's texture. Dynamic presentation can be realized by uploading videos or make PowerPoint in Second Life by setting an object's texture whose appearance looks like a poster board to a static bitmap written questions which has been uploaded to the inventory. Then attach LSL script in which there is touch_start event and llSetText function to this object to achieve picture switch.

The above means of presentation objectively and comprehensively describe problems, bringing out benefit for students to grasping the nature and overview of problems in general and thinking various solutions to solve problems.

3.3. Launch Learning Activities

Second Life provides a professional education platform for educationalists. To take NMC Campus as an example, NMC founds a platform to share information for educators and provides learners with abundant resources which help them to solve problems and complete learning tasks.

As an information tool, Search Function Module in Second Life makes learners easily find the place, group and so on that they need in this virtual world. As a tool for collaboration and communication, chat room based on text input makes teachers and students communicate and consult with each other at any time.

Since the problem has been introduced, learners can launch learning activities to explore new knowledge by making use of the learning resources and supporting tools that the virtual world provides.

Learning activities is a sum of practices carried out by learners and related study group aiming at completing specific learning objectives [5]. Fig. 3 is the model of learning activities design process.

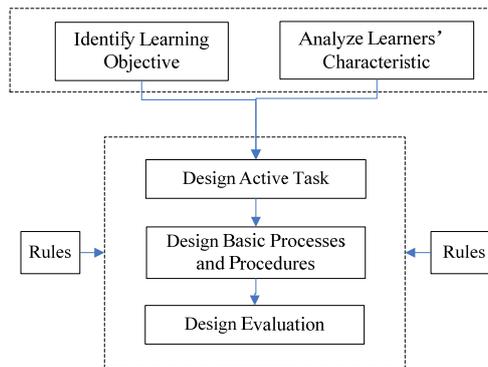


Fig.3. The model of learning activities design process.

Only taking identification of learning objectives and analysis of learners as a premise, can tasks, basic processes and procedures and evaluation in learning activity design be carried out [6].

4. Problems Second Life Faces in Distance Learning Application

The appearance of Second Life who supplies a good window to observe and research new things changes the traditional teaching mode remarkably. Meanwhile, the real learning situation it supplies arouses learners' study enthusiasm and initiative. However, launching distance learning in Second Life is not omnipotent. Problems still exist as follows which block its wider application.

4.1. High Requirement of Hardware System

Second life's smooth running requires high-quality broadband connection. However, for many small and medium-sized cities, if bandwidth can not meet the requirements, distance learning in Second Life will not be able to be carried out.

4.2. Difficult for Users in Mastering Technology

LSL, the secondary development tool, lacks ease of use. Many users who have used SL for many weeks still can't program to add dynamic behaviors to objects, increasing learners' cognitive burden.

4.3. Furtherance of Human Inertia

The development of Internet technology makes it possible for people to shop, work and study at home. However, once people enter the Second Life virtual world, they will no longer do anything without the computer and Internet.

4.4. Spread of Unhealthy Information

Unwholesome ideas and content can be easily spread in Second Life. These pornographic and violent things will easily erode the hearts of adolescent users, bringing out adverse effect on them.

5. Prospects for Second Life's Application in Distance Learning

If Second Life wants to achieve more popular applications in distance learning, it has to eliminate its technical bottleneck restrictions first to improve ease of use. After crossing the technical obstacles, every user can successfully implement the study of knowledge, creation of resources and communication with partners, as creators and users of educational resources in Second Life.

With the rapid development of computer and information technology and constant improvement of virtual world, Second Life's significant advantages and potential in distance learning will gradually attract more attention and favor, eventually resulting in wide use and important role in education. The study of Second Life-based distance education is profound and has a bright future.

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