Received: January 12, 2018
Revision received: March 22, 2018
Accepted: March 23, 2018

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www.estp.com.tr
DOI 10.12738/estp.2018.5.154 ♦ October 2018 ♦ 18(5) ♦ 2527-2532

Research Article

Usability Evaluation of Network Course Interface and Research on Teaching Method in Virtual Reality Situation*

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Abstract

Network course education is different from traditional teaching method and it has gradually developed into a new type of teaching method. At present, many people give priority to the technicality and education of network courses while ignoring its usability. However, if the network course interface is not equipped with high usability, it is difficult for network course education to continue. Therefore, the usability analysis of network course interface is of great significance for the optimization of network course learning. Based on the virtual reality system, this paper analyzes the usability of the network course education and network course interface and draws the conclusion that the usability design of the network course interface should follow the principles of consistency, comprehensibility, teaching, fault tolerance and interactivity. At the same time, targeted evaluation criteria should be established, including simple and natural dialogue, reducing the memory burden of users, technical adaptability and humanization of learning support. 50 network courses are randomly selected for evaluation and it is discovered that the personalized requirements of students have not been given enough consideration in the design process of network course interface in China. In the future, the network teaching process should be student-centered so as to improve the quality of network course education.

Keywords

Mother-child Relationship • Teacher-child Relationship • School Adjustment • Early Childhood

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* This work was supported by China University of Mining and Technology (Project-2018WHCC09)
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Citation: Yao, J., Chen, W. Q., Shao, J., Tang, X. T., & Li, Y. J. (2018). Usability Evaluation of Network Course Interface and Research on Teaching Method in Virtual Reality Situation. *Educational Sciences: Theory & Practice, 18(5),* 2527-2532. http://dx.doi.org/10.12738/estp.2018.5.154

With the continuous development of science and technology, human society has entered the information age, which has greatly transformed the teaching method and learning method of people and promoted the networked development of school education. The network learning represents the development direction of modern education and has become a new learning method, which has received widespread attention of people (Lecero & Paternò, 1998). Network learning has gradually evolved from the initial electronic courseware and counselling website to the virtual reality situation and the network course is an important composition of the virtual reality environment. There are huge differences between network teaching and traditional teaching method. Therefore, how to achieve the purpose of teaching through network courses is very important. In order to improve the effectiveness of network learning, the design and development of network courses is particularly critical. At present, many people only give priority to the technicality and education of network courses while the attention on the usability is not enough, ignoring the learning experience of learners. If the network course interface is unable to attract the interest of learners, they may terminate their study immediately. Therefore, the usability analysis of the network course interface is important for the optimization of network course learning (Allen, 2006).

Network course education Method

Virtual Reality System

At present, domestic education is more and more student-centered, giving priority to the important role of learning situation in knowledge construction, which has a great impact on traditional teaching. Teachers need to provide students with a platform to stimulate their learning interests (Oztekin, Kong & Uysal, 2010). The virtual reality system can display the virtual real world on the two-dimensional plane, which can vividly present the teaching content and easily satisfy the requirements of the scenario and natural interactivity of the learning media, as shown in Figure 1. The introduction of virtual reality system in network education can provide students with real learning scenarios, so that students who learn through the Internet can feel the real environment like learning at school and gain intuitive feelings and real effects, thus mobilizing the learning enthusiasm of students (Mcglinn, Yuce, Wicaksono, Howell & Rezgui, 2017).

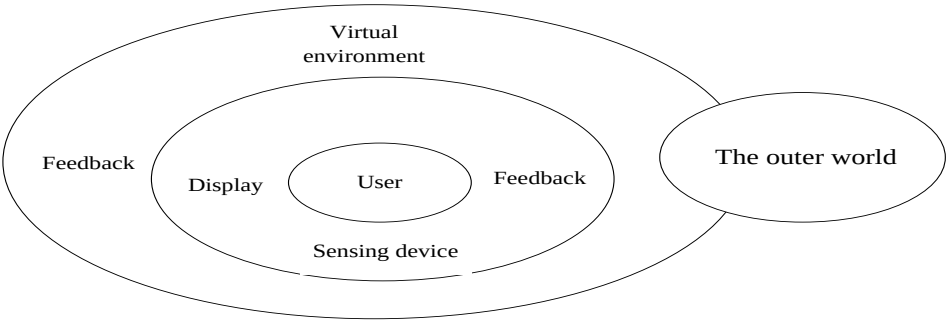

Figure 1. Virtual Reality System.

Network Course Education

Different from the traditional teaching method, the network course education can break through the limitation of time and space and realize interactive and vivid teaching. However, there is still room for improvement in current network course education. Some network courses only expand the audio and video resource library and add the amount of courseware, but do not fully exert the advantage and effect of network teaching. In essence, it only changes the location of classroom; some network courses are mainly based on inquiry. In essence, it is a replica of traditional textbooks (Schreiber *et al*., 2008). In this way, the effect of the network course education cannot be fully exerted. Moreover, the design and development of network courses requires a great deal of money and manpower (see Figure 2). If the network course education is just a multimedia classroom, the loss outweighs the gain.

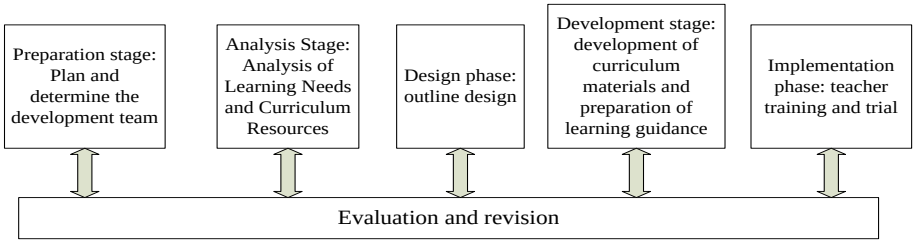

Figure 2. Distance Education Curriculum Design and Development Flow Chart.

With the continuous development of network technology, the teaching mode has been further developed and improved. The teaching structure and teaching model of network courses are also being further developed (Islam & Bouwman, 2015). Based on a large amount of research, this paper designs the general structure of network courses, whose main components and the relationship of the various parts are shown in Figure 3.

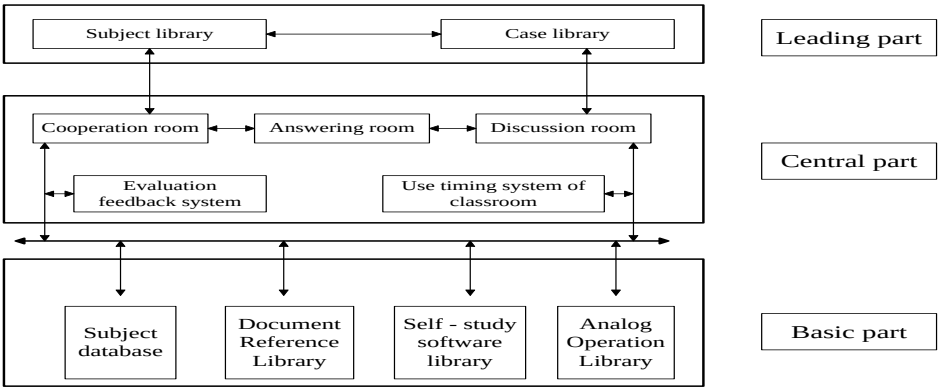

Figure 3. Network course structure.

Usability Design of Network Course Interface

In the teaching course of network courses, students can obtain the teaching resources in the network via the network course interface. At the same time, teachers and students can input keywords to search for information and control the computer through the network course interface (Park, Jeong & Kim, 2018). The usability design of the network course interface needs to include the following principles:

(1) Consistency: Students should have a sense of overall consistency after accessing the network course interface. The size, position and timing of windows, menus and icons in the interface should be relatively fixed. The overall picture should be consistent; the operating procedure should be standard; and there should be fixed position for information prompts (Simon *et al*., 2013).

(2) Comprehensibility: The design of the network course interface should facilitate the understanding of teachers and students. After seeing the interface, students and teachers should know the content in this course and how to operate. The language should be popular and easy to understand and some important information can be emphasized by special symbols, flashing or animation.

(3) Teaching: The setting of the network course interface must meet the requirements of teaching, conform to the perception and stimulate learning interest of students (Balatsoukas, Williams, Davies, Ainsworth & Buchan, 2015). The network course interface can set up some vivid pictures or animations to promote personalized teaching and guide students to think more deeply.

(4) Fault tolerance: Since students and teachers do not necessarily have a good network technique level, the network course interface itself needs to be equipped with the ability to prevent students and teachers from performing incorrect input and incorrect operation. If an error occurs, there must be some remedies and measures.

(5) Interactivity: Interactivity mainly reflects the means of dialogue between the user and the computer. In general, there are three main types: the first is the button interaction. Usually, the buttons are represented by image symbols, such as “Previous Page, "Next Page", "Exit", "Help", "Play", "Stop", etc.; the second is the menu interaction. Under normal circumstances, there are two methods for the menu: drop-down and pop-up. In order to save the space in the interface, the menu is suitable for occasions with relatively more interactive options; the third is conditional interaction. If students need to register or log in to the interface during network learning, a specific corresponding will appear, such as entering a password or entering the answer to the question to move on to the next interface. Or if the answer is wrong, a different response will give be given.

Usability Evaluation of Network Course Interface

The usability evaluation of network course interface is a complicated process. The techniques adopted by different network courses are different, so the evaluation method adopted will be different (Oztekin, 2011). At the same time, the usability of the network course interface is different from that of the network course, so four

evaluation criteria are set up when performing the usability evaluation of network course interface. Each criterion contains several evaluation items, as shown in the table 1 is shown.

Table 1
Web Course Interface Usability Evaluation Scale

Heuristic criteria	Evaluation indicators
Simple and natural dialogue (U1)	Information architecture(U11)
	Color(U12)
	Navigation(U13)
The memory burden of the user is minimized (U2)	Search function(U21)
	Memorable search record(U22)
	Prompt for current position(U23)
Technical adaptability (U3)	Clearly identify exit(U31)
	Do you need to install additional plug - ins? (U32)
	Is animation, video and audio normally displayed? (U33)
Humanization of Learning Suppot (U4)	Help and documentation(U41)
	FAQ, online Q & A, online message, etc. are provided(U42)
	Learning kits such as notes, labels or bookmarks are provided(U43)

30 network courses are randomly selected in this paper for the usability evaluation of network course interface. The specific evaluation results are shown in Table 2.

It can be seen from the data in Table 2 that the results of most of the evaluation projects are good and only the results of the three evaluation projects in the learning support humanization evaluation criteria are not optimistic, which indicates that the attention to the actual needs of students and the interactivity are not enough in the current design process of network course interface in China. After the network course learning, the confusions of students are not timely answered after the learning or there are not enough learning tools and help documents to help students improve the quality of network course learning.

Table 2
Evaluation Results

Evaluation indicators	Number of courses	The proportion
U_{11}	25	83%
U_{12}	28	93%
U_{13}	24	80%
U_{21}	24	80%
U_{22}	25	83%
U_{23}	28	93%
U_{31}	20	67%
U_{32}	28	93%
U_{33}	28	93%
U_{41}	18	60%
U_{42}	20	63%
U_{43}	18	60%

In this regard, in the design of the network course interface, it is necessary to gradually change the previous "technology-centered" concept and establish a "student-centered" concept. In the network course education, the basic needs of students should be satisfied. Only in this way can we continuously improve the teaching level and quality of network courses, thus constantly promoting the development of education cause in China.

Conclusion

Based on the virtual reality system, this paper analyzes the usability of the network course education and the network course interface, and draws the following conclusions:

(1) The usability design of the network course interface should follow the principles of consistency, comprehensibility, teaching, fault tolerance and interactivity.

(2) Four evaluation criteria are established for the usability evaluation of the network course interface, including simple and natural dialogue, reducing the users' memory burden, technical adaptability and learning support humanization. 30 network courses are randomly selected for the usability evaluation of the network course interface. It is found that the network course interface in China does not pay much attention to the actual needs of students in the design process. In the future, the network education process should be student-centered so as to improve the quality of network course education.

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