Application on M-Learning in Modern Distance Education

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Abstract - Along with the continuous integration of mobile communication technology and computer technology, M-Learning, as an emerging learning mode in modern distance education was born at the right moment. In the beginning of this paper, academic achievements of domestic and foreign experts and scholars on M-Learning in recent years were summarized, and then, an application mode of M-Learning in modern distance education was concluded. Finally, a distance autonomous learning model based on M-learning was proposed, aiming at laying a good foundation for its further study.

Keywords: M-Learning, Modern Distance Education, Autonomous Learning.

1. Preface

In recent years, with the development and combination of mobile communication technology and computer technology, mobile communication equipment with capabilities of mobile calculating is getting improved on functions, which enables learners to acquire learning resources at any time anywhere and rely on mobile learning platform system to carry out learning activities. Meanwhile, due to the defects of currently operated fixed modern distance education and further requirements from people towards distance education in the information society, a new approach of learning, namely, M-Learning is emerging as the time requires in the education field, and gradually becoming one of the hot spots in the research of modern distance education.

2. Definition of M-Learning

As an emerging learning mode in distance education, M-Learning has not got a unified and clear definition among academia. However, experts and scholars in this field have supplied their ideas and given their definitions of it from different perspectives.

Clark Quinn has given a definition of M-Learning from a technical perspective: M-Learning is a digital learning method realized through IA(Intelligent Apparatus) equipment. These IA equipment include Palms, Windows CE equipment and digital cellular phone and so on[1].

Keeping the idea of modern distance education in mind, Chabra and Figueiredo have given a broader definition: M-Learning is to be able to use the task equipment to acquire knowledge at any time and any place.[2]

The definition of M-Learning from Paul Harris is as following: M-Learning is the intersection of mobile computing technology and E-Learning. It can bring for the learners an experience of learning at any time and any place[3].

To sum it up, the definition of M-Learning can be summarized as following: With the application of mobile equipment, wireless communication technology, Internet technology and multimedia technology, M-Learning is a way of learning to offer learning resources for learners and to provide two-way communication for teachers and students at any time, any place .

3. Research Status on M-Learning in Domestic and Foreign Countries

At present, many countries in the world are carrying on M-Learning research. In Europe, there have already been more than 30 M-Learning research projects, of which each project connects each other and is independent at the same time, such as the M-Learning system based on WAP from University of Helsinki, Stanford Study laboratory (SLL), test by handheld computer in New York Cohoes middle school, Africa's Open University and so on.

The domestic research on M-Learning starts later. In the spring of 2000, a report "From E-Learning to M-Learning" delivered by Desmond Keegan, an international distance educator, in Shanghai TV University caused domestic reverberations, thus M-Learning has caused the attention of Chinese scholars. In January 2001, "Theory and Practice on Mobile Education" carried out by Modern Education Center of Peking University was the first M-Learning program. In July 2006, there established the first theme website http://www.mlearning.org.cn. In May 2007, Nokia launched the first interactive online platform "Mobile Learners". In June 2008, the first book <Mobile Learning-Theory.Status.Trend>[4] compiled by Professor Huang Ronghuai was published by Science Press. In 2009, the platform of "Mobile Phone Learning Garden" launched by Heyuan Branch of China Mobile for government personnel in the city of Heyuan, is an important means for cadre training. Therefore, China's achievements in M-Learning and the strength for continuing learning cannot be underestimated.

4. Application Mode of M-Learning in Modern Distance Education

A. Mode of M-Learning Based on SMS

SMS is the abbreviation for Short Message Service, and it refers to the function of sending and receiving text information of finite length through mobile phone. The time for SMS to occupy the channel is short and the cost is small, so it is very convenient for two GSM users to carry out point-to-point communication. At present, general mobile phone terminals all have this function, and there is no need to add any hardware or software modules. Through short messages, it can achieve the transfer of limited characters not only between users, but also

between the user and the Internet server. Through mobile phone, users can send short messages to the internet teaching server. After an analysis of the users' short messages, the teaching server turn it into data request and get the data analyzed and processed, and then send them back to users' mobile phone to realize the communication between users and the server and finally achieve a certain teaching activities. This kind of teaching activity is no longer limited by time, sites or places to truly realize the learning at "everywhere and every time". Its detailed functions include teaching activity notices both from the school to the teachers and from the teachers to the students, Q&A between the students and the teachers, test score inquiries for the students and so on.

This education mode based on short messages are suitable for teaching activities with less communication data and simple texts. The system structure based on the scheme of SMS is as below.
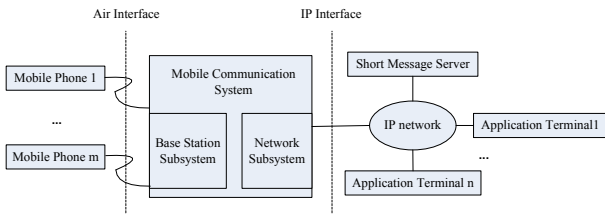

Fig.1. The System Structure Based on the Scheme of SMS

B. Mode of M-Learning Based on Browse and Connection

For communication with SMS, the communication of data is interrupted and no real-time connected, so it cannot realize website browsing of mobile phone by this kind of communication, and it is also difficult to transmit and display multimedia resources. However, with the launch of 3G communication protocol, browser-oriented mobile devices will be soon get popularized. By then, M-Learning will change unprecedentedly in convenience and service quality. The teaching activities will not be temporal, spatial, or geographical constrained, and will get a higher quality guarantee. However, the change of education platform from computers to mobile devices will bring about a series of problems:

(1) Problem of Communication Charge. Connection-Oriented Protocol will allow long-time connection. However, charges according to time will be very expensive, at present, many manufactures recommend charges according to flow.

(2) Problem of Format conversion. There is a huge difference between the mobile device screen and the computer screen, so the display format should change correspondingly according to the size of the screen of mobile devices. The information received by mobile devices(mobile phone, PDA, etc.) is based on WML(Wireless Markup Language), while the page file of the general Web server is saved with the format of HTML (Hypertext Markup Language). Therefore, when online Internet browsing through mobile devices, it needs to convert files of HTML into files of WML. At present, an applied means is to orient the provisions of WML, as well as develop a

set of transformation middleware between HTML and WML. When browsing web page through mobile devices, the middleware will convert files of HTML into files of WML, and then transfer them to mobile devices to display.

(3) The Development of Education Software Based on Mobile Terminals. With the continuous innovation of technology, the current functions of mobile devices are so powerful that it can operate multimedia applications such as Flash, MP3, MP4 very well. Therefore, it can achieve the multimedia interactive learning effect similar to computer learning software. However, many computer softwares are based on the screen of the computer, so when transplanting the software to mobile devices, it needs to make appropriate modification to the program.

5. Distance Autonomous Learning Model Based on M-Learning

Modern distance education is under the guidance of the modern education theory. It is a teaching mode making use of computerized media and network communication technology to organize teaching, implement learning, and communicate, so as to complete each part of the teaching process.In this teaching mode, because of the temporal and spatial separation between teachers and students, it requires that learners are highly responsible for their independent learning, that is, the ability to learn autonomously. M-Learning is the expansion and extension of modern distance education, and it almost has all the advantages of fixed distance learning, such as open, systematism, multimedia, interaction, virtualization and so on. Moreover, compared with the fixed distance learning mode, it has the characteristic of digital, flexibility, portability, and individuality. Compared with digital learning, in M-Learning, students do not need to be constrained in front of the computer desk, and they can learn freely at anytime anywhere, with different purposes and methods. The teacher, the student, the teaching content, and the teaching media, which are the four factors of the teaching process, are all mobile. So the application of M-Learning in modern distance education will make full use of its characteristics and dig out students' autonomous learning potentials. In the learning process, students will embody five characteristics of self-identification, self-direction, self strengthening, self-adjustment, and self-monitoring. In order to better reflect the above characteristics, in this paper, it has constructed a learning supporting system based on mobile terminals and complex autonomous learning modes primarily with interactive, cooperative, individualized and self-monitoring learning processes.(shown in Fig. 2) :
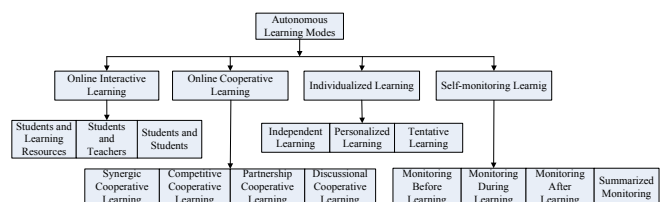

Fig.2. Distance Autonomous Learning Model Based on M-Learning

6. Conclusions

At present, the application of M-Learning in modern distance education has been very prosperous. With its unique advantages, M-Learning has been recognized. However, there still remains some defects in M-Learning, such as lacking of learning resources, diversification of mobile communication devices, expensive communication charge, unstability of network communication. These all need to be solved.

M-Learning is an emerging digital learning mode, and is the product of the integration of mobile communication, network technology and modern education. It leads to the emergence of mobile data communication and mobile Internet. Due to its various advantages, it has been commonly recognized in the application of modern distance education. It is believed that with the gradual improvement of the mobile learning theory research and its related technology, M-Learning will play a bigger role in modern distance education.

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