

The Development and Prospect of New Technology in Modern distance education

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Abstract: Modern distance education is a new way of education derived from the extensive application of new technologies. With the development of new technology & media, distance education is also developing. This paper goes as follows: firstly, introduce the concept of distance education and the importance to construct a learning-oriented society & lifelong learning system. Then, expound the current status of distance education, pointing out shortcomings such as instable images, poor interactivity and unintegrated resources. Next, considering the superiority and development space of 4 new technologies--Data Mining, Cloud Computing, Internet of Things(IOT) & Triple-Play, look forward to the prospect of new technologies application in distance education.

Introduction

Nowadays, new technologies have constantly sprung up. Human demand on education is increasing as well. Modern distance education is an important means to spread information, to learn culture and to construct a lifelong learning system in the era of intellectual economy; this new mode is gradually accepted. It promotes reform in educational thought, content & methods, greatly promotes the modernization of education, and satisfies increasing demand on improving culture cultivation. Mei Sun (2012) pointed out that student-centered and self-learning based modern distance education allows relative separation of time&space between students and teacher. Teaching mainly relies on use of various medium and interactive means [1].

Life is a journey of constant learning. Cultivating talents only from full-time school education can no more meet the needs of developing modern society, which requires everyone should have the awareness of lifelong learning. All learning has become an urgent need to individual and the whole society. People must change ideas to adjust to need of the age, constantly learn new things and make learning a lifelong activity. As tools of lifelong education, it's necessary to constantly improve modern distance education system, innovative education mode and integrate new technologies, so as to promote educational thought, content, method and mode change, which will deeply affect and better guide learning.

Current status of modern distance education

Now, we are in an information network era, characterized by diffusion and penetration of computers and Internet technologies. Rapid development of information technologies will significantly influence the learning environment. With the development, the forward-looking online education is becoming practical, which brings huge impact on traditional learning way. Judging from the development history, we generally accepted that distance education could be divided to 3

stages. First is correspondence education stage. Broadcast & TV education stage follows, mainly relying on radio, TV, audio and video recordings. Third is modern distance education stage. Modern distance education is a new education form by using network, communication, multimedia and other information technologies to conduct education.

Current distance education mainly adopts computer multimedia technology on Internet. Internet is a global and highly efficient technology in teaching transmission. Its resource sharing can achieve data transmission and interaction across time and space, which greatly supports modern distance education and training. Distance education provides new educational opportunities to those who can't go to school for various reasons. It is widely accepted by people as a new way of learning. It plays an important role to promote the development of our modern education. However, distance education is still in its infancy and limited by various conditions. There are still certain problems and deficiencies in its development.

Xiaoli Jia (2008) wrote that at present, China's distance education is still not mature. Students off campus are mainly taught through radio, video or other streaming media technologies in real or non-real time. However, constrained by bandwidth and other factors, online teaching could encounter many problems--slow network transmission, instable image, sudden line interruption etc., which will heavily reduce information transmission and interaction, affecting the quality of distance education [2].

As known to all, the essence of modern distance education is educational resources sharing, including teachers, teaching contents and educational thoughts. While many cyber schools only present their own resources to the public, sharing some resources but in a relatively limited range. Now many educational websites establish their own distance education systems, dispersed with each other. These education systems lack of interaction in exquisite courses, teaching methods and educational thoughts, which restricts a greater share and communication of online education resources, resulting duplication and waste in educational content development.

Distance network education lack certain vividness and interaction. So far, most of online curriculums are still dominated by large amounts of text. Teachers only mechanically reproduce the book content online, and inculcate it to students. This teaching method is stiff, of no extensibility and richness. Due to space limit, there are no face-to-face communication & discussion between students and teachers. Teachers are not able to observe students' reaction and to know their understanding of content, nor able to timely adjust teaching method or process according to students' feedback; students can't get teachers' advice timely in learning process when encountering problems. All these delay will greatly influence effectiveness of learning.

New technology as the driving force of modern distance education development

In recent years, Information Technology, Network Technology, Sensing Technology is developing very rapidly, represented by Cloud Computing, IOT, Data Mining and Triple-Play technologies. These technologies are strong bases of modern distance education and driving force for further development. Then analysis the prospect of modern distance education in terms of Data Mining, Cloud Computing, IOT and Triple-Play technologies.

The Data Mining Technology

Jianjun Bian (2011) said that Data Mining refers to process of using new technology and tool to intelligently & automatically extract valuable information from large databases. Data Mining leads data management technology to a more advanced stage. It not only can analysis the historical data and reveal hidden pattern, but also can analysis potential valuable information, so as to facilitate

transmission and use of information [3].

So far, domestic and foreign experts based on Association Rule and Cluster Analysis, have made certain achievements in researches of education field. Zhongxiang Sun (2012) referred in his paper that ShuXun Huo and other experts used Association Rules to analysis large amounts of higher schools' teaching appraisal data and generated some effective association rules through case studies [4]. Meiling Liu put forward a method of performance cluster analysis based on K-Means algorithm. Educators can get some useful information through analysis of students' actual achievements and use it to implement individualized teaching and guidance. Hsia used Decision Tree Algorithm to research on curriculum carried out by Center of Continuing Education of a Taiwan higher school and to analysis what courses are most popular , so as to meet various students' needs and cultivate more and better talents for the local.

Abundant information resources are the core and base of modern distance education. Depending on modern network, these huge amounts of information sources provide convenience for modern distance education; while at the same time, bring difficulties in information obtaining, gathering, classifying and other problems. Supposing the situation that we need to make a survey on learners' satisfaction. Traditionally we use statistical analysis methods such as questionnaires to obtain information, but it's time-poor and inaccurate and can easily lead to decision failed. With Data Mining technology, we can analysis existing data -- learners' behavior, their evaluation of teaching methods and their reaction to different teaching methods, to determine what kind of learners or courses these teaching methods suit for. Pertinently data analyzing and mining could enhance education quality and learning needs. Therefore, with full use of existing data and pertinent data analyzing & mining, we can find effective methods to improve distance education quality.

The Cloud Computing Technology

There is no unified definition of Cloud Computing. According to its principles and features, Li Niu, Ke Chen, Jinxiang Li (2011) described: Cloud Computing is an Internet-centric computing style based on overt standards and service which can provide superior computing power and safe data storage. Cloud Computing is a mode of resource delivery and use, which means users pay to use resources. Cloud Computing is a huge virtual resource pool composed by hardware, platform, software, etc. It can automatically configure according dynamic load size and optimized use of resources to achieve full share of resources. Cloud Computing requires low about users' terminal device. Wherever you are, as long as you can connect to Internet, you can enjoy the mass storage and unlimited computing provided by Cloud Computing Service [5].

Though education field is the initial to use Cloud Computing, its promotion seems to a bit low. While the potential market is unignorable. Many companies have developed their own cloud computing education plan. Liu Niu (2011) pointed out that after "Google101" Program, Google has cooperation on cloud computing program researches with National Taiwan University, National Chiao Tung University and Tsinghua University. Other giants followed the pace and carried out their own cloud computing programs, such as IBM "Blue Cloud", Amazon's open-end fund in cloud computing, and foundation of Hangzhou Normal University--Microsoft IT Academy. All in all, these programs laid a solid foundation for cultivating talents for domestic and foreign cloud computing industry. At the same time, it builds up cooperation bridges between business and education, further promoting the popularization of cloud computing in education field [6].

Cloud Computing has been rapidly promoted in recent years. Its powerful storage capacity and computing power can meet the needs of storage, transmission and on-demand in distance education courseware. At present, though to some extent distance education achieves integration, but has not

yet achieved resource sharing in true sense. There are many problems like uneven resource distribution, slow update, high construction cost, no cross-platform application and lack of interaction, which seriously restricts further development of distance education. Using Cloud Computing technology can effectively integrate existing education resources to centralized management. It can increase resource availability, student initiative and use of quality teaching resources. It can also reduce duplication of teaching content and enable teachers more energy to teaching content and methods design in distance education reform.

The Internet of Things Technology

Hua Li (2012) pointed out that Internet of Things Technology, precisely say, is to sense the behavior perception contained by the technology itself. Through the acquisition, processing and analysis of human behavior data, IOT technology finds the perception characteristic and carries out the perceptual recognition. Internet technology is part of IOT technology. Internet-based distance education, through the integration of RFID Technology, Location Technology and Sensing Technology of IOT, can be more clear of the learners' identification and can record the accurate learning time and learning process [7].

Practical IOT Technology, distance education and on-site education will be integrated into one. Students online can be absolutely accessible to learn courses through teachers' instruction, blackboard writing, gestures and multimedia methods, and can timely feedback their understanding of the content. Teachers on teaching site can control the teaching process according to students' performance. Practical IOT will achieve a full range of interactive learning between students and teachers. Zhaogong Deng and QingBing Sang (2010) pointed out application of IOT technology has changed the old learning mode of distance education and developed to a new learning style with more teaching scenes and interaction, which not only make students experience the immersive teaching process with more attention but can improve learning quality [8]. For example, "Looking at Starry Sky" Digital Observatory Project, carried out by primary and secondary schools in Wuxi City, is one of practical education projects that IOT technology promotes students' scientific exploration in school. This digital observatory project make use of IOT technology to connect four digital observatories to network and open free to all students, which makes the high-end research facilities shared by more students in the region. Reserving online, students can control telescopes remotely on Internet and observe the space. They can also download pictures they observed, share data with others and collaborate in learning.

The Triple-Play Technology

Distance education system is developing toward a real-time, interactive multimedia system integrated with voice, video and data. Triple-Play is the best technology to achieve this process. Triple-Play refers to the technology & business consistence in the process that Telecom Network, Broadcasting TV Network and Internet develop to Broadband Communication Network, Digital TV Network and next-generation Internet. Network interconnection and resource share can provide users with various services on voice, data, radio and television. Triple-Play is the developing trend of modern information technology integration. It will provide a more rapid platform for the development of modern distance education.

Core business of Triple-Play is video services -- stable, reliable live video & download from Broadcasting Television Network, convenient on-demand service from Telecom Network. This greatly facilitates students to obtain knowledge and meet their diverse needs. Distance education "On Web, On Cell phone, On TV" makes information comprehensive coverage. Based on computer,

distance education covers to intelligent terminal devices like iPad, TV and smart phone. Distance education is developed to an application and published on major operating systems, also compatible with phone and pad, which enables distance education to achieve three-screen interaction and integration in phone, computer and TV and to develop in various intelligent terminal devices.

Conclusion

The emergence of Internet and progress of communication technology have directly promoted the rapid development of computer-based online network education. Meanwhile, modern distance education, representative of the education field, is changing the development direction of higher education, carrying the duty to enable every people enjoy a lifelong education. The emergence and development of Data Mining, Cloud Computing, IOT and Triple-Play Technologies will provide a new development platform to modern distance education. But now, we are still in exploratory stage of these new technologies, with no large-scale application and development and no thoroughly integrated Triple-Play technology platform. These problems remain to be solved later. To better apply these new technologies in the future, there is still a long way to go.

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