A Panorama of Online Education in China

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Introduction

The Ministry of Education (MOE) of the People’s Republic of China launched a national initiative, The National Program for Invigorating Education Towards the 21st Century, in December 1998. The national initiative provided specific guidelines for the development of information and communications technology (ICT) applications in education for the following five years (1999–2003) in China. Since its inception, the national initiative has also played an important role in promoting the development of online education in China.

Online education has been evolving in China since the late 1990s, especially in the fields of higher education and basic education. Many higher educational institutions in China are currently encountering a great demand for enrollment due to an increasing population of education pursuers. Online education is believed to be a fast and economical approach to meet the demand. In basic education, the uneven distributions of educational resources and various qualities of educational service providers (e.g., quality of teachers) among different districts in China have triggered the emergence of online virtual schools (Ma, 2001). Meanwhile, some national projects initiated by the Chinese government have stimulated the development of online education in the public school system as well.

This article presents an overview of various efforts toward developing online education in China, and describes the progress that has been made both in the areas of higher education and basic education in recent years. In addition, some ongoing national projects related to online education are briefly introduced. Finally, some issues pertinent to online education are discussed and recommendations for further developments are made.

The Case of Higher Education

Since the open-door policy was adopted and implemented in China 20 years ago, the enrollment of students into higher education has increased by 8.5% annually, from 0.28 million in 1980 to 1.56 million in 1999 and 2.75 million in 2002 (Li & Yan, 2002; Tang & Liu, 2001). Despite a drastic increase in enrollment, the capacity of higher educational institutions in China in meeting these demands falls short. Such large demands are the results of the rapid growth in the economy and population in China. Therefore, the Chinese government has been attempting to expand the enrollment of higher education in the hope that the raw rate of annual enrollment will increase from 11% in 2000 to 15% in 2005 (Yang, 2001). The existing resources of higher education cannot meet the requirements of this expansion. To a certain extent, the discrepancy between the demands of having opportunities to study in higher educational institutions and the shortage of educational resources stimulates the development of online education in China. Thus, online education has become a realistic option for China to expand the scale of higher education.

In September 1998, the MOE started to grant online education licenses to Tsinghua University, Beijing Post and Telecommunication University, Zhejiang University, and Hunan University as the first batch of higher educational institutions pioneering online education. In the same year, the number of students enrolled in online education affiliated with these four universities reached 9,000. In 1999, Beijing University and the Central Broadcast and Television University were added to the pioneer list. By May 2002, up to 47 universities in China had received online education licenses, and the total number of student enrollment had reached over 400,000 (Mao & Zhai, 2002).
The Academic Levels of the Online Education Offered

All the universities with online education in the pioneer list are empowered with great autonomy in selecting students, deciding the numbers of enrollment, opening new specialties, and issuing academic credentials acknowledged by the MOE. Currently, online higher educational programs are mainly offered at the following three levels (Huang & Luo, 2002; MOE, 2001):

- **Undergraduate degrees.** The candidates must be senior secondary school graduates or special training diploma holders (e.g., graduates from polytechnics). The senior secondary school graduates can start their undergraduate studies based on their grades at the university entrance examinations. The special training diploma holders need to participate in entrance examinations for admissions. After completing all the requirements, they will be awarded a university degree. The online education on the undergraduate level is strongly encouraged/supported by the MOE, and most higher educational institutions on the pioneer list offer higher education on this level. Furthermore, undergraduate students can also pursue double degrees in their undergraduate studies. The students are exempted from entrance examinations but have to show qualifying university academic records instead.

- **Master’s degrees.** The participants in the Master’s degree programs must have a recognized bachelor’s degree. They are recruited without taking the entrance examinations. Their admissions are based on their past academic records at the universities they previously attended. After completing sufficient credits and passing a thesis defense, students will be awarded a Master’s degree. Currently, Tsinghua University, Beijing Polytechnic, and Shanghai Jiaotong University are offering online education programs on this level.

- **Special training diplomas.** Those who are not qualified with undergraduate studies can participate in online higher education on this level. They will get special training diplomas after they have obtained sufficient credits.

The Specialties Offered by the Online Higher Educational Institutions

Online higher education in China covers a great number of specialties. For example, the Central Broadcast and Television University (as a specialized online educational institute) has offered nine subjects covering 497 specialties. During the past two years, the higher educational institutions on the pioneer list have offered 10 broad categories with 57 specialties (Huang & Luo, 2002). Specifically, 13 specialties belong to the category of management, including business management, corporate management, human resource management, industrial engineering management, and real estate management; 11 specialties fall into the category of engineering, such as transportation engineering, communication engineering, and civil engineering; seven specialties are included in the category of economics, including finance, international economy, and trade. In addition, there are six specialties in the category of literature and history, four specialties in computer engineering, and some specialties in law, medical science, arts, education, and agriculture.

Among those institutions offering the 57 specialties, 76% of the pioneer higher educational institutes have offered the computer engineering and business management courses that are becoming two popular specialties in China. Sixty percent of the pioneer institutions have opened a financial specialty, and 48% of them have established the specialties of English language and laws (Lab of e-Learning, 2002). Undoubtedly, these numbers indicate the kinds of personnel that are greatly needed in the human resource market in China currently.

The Instructional Delivery Models

Basically, two instructional delivery models are popularly adopted in online higher education in China. One is the distance lecturing model, and the other is the distance self-learning model (Huang & Luo, 2002). In the distance lecturing model, an instructor gives a presentation on campus, and the presentation is delivered to remote learning sites through a digital satellite or an interactive video conferencing system. Meanwhile, students at remote learning sites watch and listen to the presentation, ask questions, and get immediate feedback from the local mentors or from the remote instructors through the network. Furthermore, the distance lecturing model is accompanied with asynchronous discussions among students and/or between students and instructors. Learners can also browse learning resources, take online quizzes, and submit assignments through the network. The staff in local learning sites are responsible for technical support, practicum supervision, and assessment (e.g., administering final exam).

Compared to the distance lecturing model, presentations in the distance self-learning model are not delivered in real-time to remote learning sites. Rather, the presentation is pre-recorded in CD-ROMs and then mailed to the remote learning sites or learners directly. Similarly, learners can have online discussions with their peers or instructors as well.
The Case of Basic Education

The MOE also promotes experimenting and implementing online basic education in public schools. According to the MOE (2000), ICT will be popularly utilized in both primary and secondary schools in the next five to ten years. Currently, the online basic education is growing rapidly both out of schools and in schools in China.

Off-Campus Model: Online Virtual Schools

Besides public schools, there have been some 200 online virtual schools in China, which are mainly sponsored by enterprises. The total number of enrollment in these online virtual schools has reached over 600,000 (Zhang, 2002). For example, in Beijing alone, there are more than 30 online virtual schools, such as the 101 Online School (http://www.chinaedu.com/), the Jingshan Online School (http://www.jsedu.net/), and the Hope Online School (http://www.hoho.edu.cn/).

The online virtual schools usually offer (i) online teaching; (ii) answering questions by excellent teachers; (iii) online practice; and (iv) analyzing test results. The students are from public schools who take part in the online virtual school learning on their own time. Most parents of the enrolled students expect that their children can learn more from going to online virtual schools, increasing the chance of getting into universities in the future.

School-Based Model: Campus Networks

With the rapid growth of the Internet, campus networks in schools are becoming increasingly essential and significant for public schools, since they can provide learners as well as teachers with more flexibility in accessing instructional resources and materials. In addition, campus networks have the potential to make school management more efficient (Zhu, 2001a). Currently, more than 10,000 schools in China have established campus networks, and more schools are in the process of being wired up.

To promote the development of campus networks in schools, the Chinese government has initiated several projects (see next section). Undoubtedly, this investment will help initiate and develop campus networks in the western part of China. Furthermore, the construction and improvement of the China Education and Research Network (CERNET) also accelerates the development of campus networks. As a backbone of the educational network in China, the CERNET has fast Internet connections. After campus networks in schools have been set up, schools can be easily connected to the Internet through the CERNET. So far, the CERNET has connected more than 160 cities, with more than 900 educational institutes and more than eight million users. More information regarding the CERNET can be found on the Web (http://www.net.edu.cn/).

National Projects

As previously mentioned, the MOE has launched a series of national projects in recent years to promote the development of online education in China. This section briefly describes some related projects.

The Modern Distance Education Project

This project was initiated by the MOE in 2000, which includes four sub-projects:

- **Online course construction for higher education.** The primary goal of this sub-project is to build up approximately 200 online courses, as well as their supporting case bases and test bases. These online courses can be accessed and utilized by both learners and teachers at a distance. The cases can be used as study examples, and the tests are for learners' online practice and diagnosis.

- **Online education resource construction for adult education.** This sub-project aims at collecting, designing, and developing online educational resources, and providing instructional support and management for adult education.

- **Online education resource construction for basic education.** It intends to develop two complete online courses (English language and information technology) and case bases for other subject areas. In addition, a resource gateway for basic education will also be established.

- **Online training for in-service school teachers.** The main objective of this sub-project is to develop 35 online training courses and their supporting materials for in-service school teachers.

More detailed information regarding the Modern Distance Education project can be found on the Web (http://www.cde.edu.cn/).

The Connecting-All-Schools Project

This project was initiated by the MOE in November 2000. The general goal of the project is to help about 90% of primary and secondary schools all over China to be connected to the Internet and to access online instructional materials within five to ten years. Specifically, by 2005, all schools located at central countryside towns (e.g., with a population under 50,000) in the eastern districts of China and all schools located at mid-size cities (e.g., with a population ranges from 200,000-500,000) in the western districts should be able to connect to the Internet. By 2010, about 90% of schools all over the country will be connected to the Internet (MOE, 2000).

Currently the Connecting-All-Schools Project is broadly implemented. Some localities in China are...
ahead of schedule. For example, Shanghai basically met the requirements of the project by the end of 2002 (Yao & Wang, 2002). All primary and secondary schools in Shanghai are now connected to the Internet. In addition, there is one computer for every eight senior-secondary school students; one computer for every 10 junior-secondary school students; and one computer for every 15 primary school pupils in Shanghai. More information regarding the project can be found on the Web (http://www.moe.edu.cn/base/czdyjy/2.htm).

The E-Learning Technology Standardization Project

Hundreds of educational/information technology companies are competing in the Chinese online educational market. Consequently, many online educational systems developed by various educational companies are experiencing difficulties in sharing resources and interoperating systems, due to different technology standards used. In 2001, the Chinese e-Learning Technology Standardization Committee (CELTSC) was established, which is responsible for developing a standardized framework for the development of online learning technology systems (the first author of this article is the director of the CELTSC, in charge of designing the framework). Thirty standards have been proposed for the framework, and 11 specifications have been published by the CELTSC. More information regarding the CELTSC and the project can be found on the Web (http://www.celtscc.edu.cn/).

Discussion

In recent years, China has made great progress in terms of online schooling in both higher education and basic education. However, many problems have surfaced in the process of online education development. This section attempts to discuss some of these issues and to make recommendations for future development of online education.

The conventional ideologies of education and traditional methods of teaching have become major barriers to the effective utilization of ICT in education. Online education calls for a new type of teaching-learning culture (Zhu, 1999). However, the majority of Chinese online teachers have not been ready to change their teaching. For example, although a large number of higher educational institutions have joined the online schooling efforts, most of them are using conventional instructional methods. To them, online educational efforts are simply an extension of conventional classroom teaching. Although online education increases the numbers of student enrollment, the competence of the graduates of the online higher educational institutions is not convincing (Ma, 2001). Meanwhile, similar problems exist in the field of basic education. Although many schools have been well equipped with advanced ICT facilities, such as computers and multimedia projectors in classrooms, the effective use of the equipment in classroom practices to obtain better learning outcomes is unclear to most school teachers. Hence, there is a great need to enhance teachers' competencies in using technologies for teaching in effective and innovative ways. To meet the need, substantial efforts on training and research are required.

From the training perspective, teachers need lots of support in adapting educational pedagogies, which can help them plan and implement online educational activities in an innovative way. Currently, some teacher training programs are being carried out in China. For example, the Intel Corporation's sponsored program, "Intel Teach to the Future," aiming at facilitating teachers in integrating ICT in education, is broadly welcomed by school teachers in China (Intel Corporation, 2000). From the research perspective, a considerable number of projects from the National Five-Year Research Program of Educational Sciences (2001–2005) have also been launched, dedicated to theoretical and experimental research concerning ICT applications in education. For example, the project, "Theories and Practical Models of Educational Informatization," aims at investigating how to effectively integrate ICT into teaching and learning processes based on innovative theories, such as constructivist and collaborative learning (Zhu, 2001b).

Another common problem in both higher education and basic education in China is the lack of online instructional resources (Sun, 2001). For instance, many courses do not have the existing online supporting materials, such as Web-based interactive courseware. Even when the online supporting materials are available, they are often criticized for being merely textbook copies with minor modifications. Improving the quality of online instructional resources is crucial to the further development of online education in China. Efforts must be consolidated to ensure that this issue be tackled.

Online/distance education is expected to provide learners in economically less developed districts with more opportunities to study. However, the current situation is that those less developed districts do not have adequate technological facilities, such as computers and Internet connections. As a consequence, online education in those districts encounters basic difficulties (Sun, 2001). Optimistically, the Chinese government has been investing more money in the construction of network infrastructure in those less developed districts. In the near future, online education in the economically less developed districts will advance tremendously.

We recognize that the issues raised in this article are also concerns faced by other countries in the development of online education. In our analysis,
China is progressing in online education, which will transform how instruction and learning are done in this nation. We hope that this article provides the reader with a comprehensive overview of the development of online education in China.

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Letters to the Editor
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Exploring the World Wide Web for Online Learning: A Perspective from Taiwan

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Introduction
The National Open University and Open Junior Colleges are the major providers of distance education in Taiwan. In previous years, printed materials served as a fundamental element in distance education. Although the courses were also delivered by radio or television broadcasting, these programs have provided only a few opportunities for face-to-face tutoring for distance learners. In 1995, NII (National Information Infrastructure) and ISDN (Integrated Service Digital Network) local commercial services were launched in

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