Internet/Web Technology in Higher Education in China

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Abstract

With the dramatic development of the Internet and the WWW, Internet/Web technology has become an important educational technology and tool for developing higher education. This paper will examine Web technology in higher education in China. More specifically, it will overview the history of Web technology in China, and examine the application of Web technology in higher education in China. Furthermore, we will investigate the influence of Web technology on development in higher education in China from both a micro viewpoint and macro viewpoint.

Keywords: Internet, Web technology, higher education, Web education.

1 Introduction

The revolution of the Internet and the WWW since the end of last century has not only been changing business activities such as shopping, negotiation, retailing [10], and our working styles, and communication styles [7], but also changing our higher education activities at two different levels. At a micro level, the Internet and the Web as important tools have changed the methods for preparing lectures and lecturing, and the faculty and students use the Internet and Web as their media for expanding their understanding of knowledge and the outside world. At a macro level, the Internet and the Web have narrowed the difference between universities in China and the universities in other countries in the fields of how to develop a university and how to establish the relationship between a university and industry, government and other countries. However, China is still a developing country. Among 1.3 billion Chinese, average use of the dramatically developing Internet/Web technology is still at a low level. This paper will overview the history of Web technology in China, and examine the application of Web technology in higher education in China. Furthermore, it will investigate the influence of Web technology on development of higher education in China from both a micro viewpoint and macro viewpoint. It also looks at some issues in applying Internet/Web technology in higher education in China.

The rest of this paper is organized as follows: Section 2 reviews the history of the Internet and Web technology in China. Section 3 examines the application of Web technology in higher education in China. Section 4 investigates the influence of Web technology on development of higher education in China. Section 5 examines Web education in China. Section 6 looks at some issues in applying Internet/Web technology in higher education in China. Section 7 ends this paper with some concluding remarks.

2 History of the Internet and Web Technology in China

The Internet is a collection of interconnected networks, all freely exchanging information [11]. The Internet is also the world’s largest computer network and information/knowledge provider or knowledge-based system. The Internet has been available in China since 1993 [11]. CERNET (http://www.edu.cn) is the China Education and Research (Computer) Network, which was initiated in 1994 and supported by the Chinese government [1][2]. It is now the biggest non-profit computer network in China. The first author was responsible for connecting Hebei University (see http://www.hbu.edu.cn) to the CERNET (which was centered in Qinghua University) in 1995. The university was one of the first few that accessed the Internet in China. More than 1000 higher institutions have connected with CERNET, in which more than 100 universities are connected with CERNET at a speed of 100~1000Mbps.

The Internet/Web technology has become an important educational technology in China. It is an educational technology for sharing educational resources. The Internet and the WWW are the most powerful and the fastest growing medium for higher education, because almost every activity in higher institutions has, to some extent, been transferred to the Internet and the WWW.
3 Current Applications of Web Technology in Higher Education in China

Basically speaking, the current application of Web technology in higher institutions in China is to speed communication and share information using the Internet Services available in universities in China [11][8]. The most commonly used Internet services include e-mail, chat room, newsgroups, browsing information, and finding and downloading files.

3.1 E-Mail

Electronic mail or e-mail [11] is now the most commonly used Internet service for the students and staff in the universities to communicate nationally or internationally. E-mail has changed the way of people communicate [11]. For example, it has improved the efficiency of communication by reducing interruptions from the telephone and unscheduled personal contacts. Further, messages can be distributed or forwarded to many people easily and quickly without inconvenience. Another important reason for using e-mail is that the user can feel that by using e-mail the distance between users disappears so that the user can contact whoever and whenever.

3.2 Chat Room and Newsgroups

A chat room is a facility that enables two or more people to engage in interactive “conversions” over the Internet [11], (p. 300). It is very popular for Chinese students. They use a chat room to discuss international politics, study issues, and current research and development of interest. In particular, they use the chat room to discuss and understand the youth issues such as love and making friends, etc. However, the chat room is not so interesting for staff members in universities. While newsgroups are not so useful for students, some staff use newsgroups to gather information about current research and development of the staff’s corresponding research fields in the world.

3.3 Browsing Information

Browsing information is another important internet service for Chinese faculty and students in universities. Because research resources such as literature in China are not yet shared among universities, browsing information using the Internet has become more and more important for students and in particular for staff members in universities. They also use the Internet to browse news of international politics, international conferences and information about other universities internationally.

3.4 Finding and Downloading Files

Finding and downloading files is also important for students and staff members in universities. They use available search engines such as www.google.com on the Internet to search for the information of interest on the Web, and sometimes, they also download and print it in a hard form.

It should be noted that the Internet phone, internet video-conferencing and content streaming commonly used in developed countries [11] have not yet seen much use in universities in China.

4 Influences of Web Technology on Higher Education

In the past decade, the Internet and Web technology have had an important influence on curriculum development, academic degree education, and university development from a macro viewpoint, while from a micro viewpoint, they have obviously changed the studying style and teaching style.

Before the inception of the Internet and the Web, Chinese students and staff members basically used public media such as newspapers, TV, books and journals to get information from the developed countries, although some academic staff members have a background of education and/or working experience in western countries, and there were a few foreign academic staff members that visited a university in China annually. However, the situation has changed dramatically since the Internet entered the universities. The Internet has become the most important medium or window for Chinese students and staff members to gather information from other countries.

4.1 Curriculum Development

Traditionally, the curriculum development in universities in China was completely controlled by special committees of the Ministry of Education. Therefore the academic degree education is consistent with this national curriculum. Another reason for this situation is that Chinese youth must pass the national examination for entrance of universities in order to be accepted for higher education, and graduates with Bachelors degrees must also sit the national examination to enter postgraduate study (in most cases). This requires that all students use the textbooks edited according to the national curriculum guidance. The development of the Internet and also the market economy has gradually weakened the national curriculum, because the training of students must also meet the social requirements of an ever-changing market-economy. One national curriculum is not enough for such flexible social requirements. Further, the national curriculum for majors such as computer science and
information technology lags the change of curriculum in universities in developed countries. However, students and academic staff members often browse information about curriculum development in universities in developed countries, and update the available curriculum in order to meet the changes of the curriculum development in the world. For example, Hebei Normal University (http://www.hebtu.edu.cn) has changed the curriculum of Information Technology by providing more subjects related to the Internet, WWW and e-commerce from a viewpoint of Information Technology.

4.2 Academic Degree Education

The traditional higher education in China basically offered “elite” higher education because of lacking necessary resources. For example, in 1977, more than 5.7 million young students sat the first national examination for entrance of universities after the Culture Revolution, but only 273,000 examinees had the chance to enter universities (including colleges and special teaching schools) [13]. This situation has gradually changed, because elite higher education can not meet the urgent requirement for students with higher academic degrees in a market economy. In particular, with the Internet development, more and more Chinese know of academic degree education in developed countries such as that in USA, Germany, Canada, Japan and Australia. For example, every Australian university has the right to offer higher degree education such as postgraduate education and PhD research supervision, which is still not possible for any university, in particular, for any department in universities in China. But the elite higher education has been gradually replaced with mass higher education since 1999, which dramatically increased the number of university students. More and more departments in universities have the right to offer postgraduate education, although they still may have no right to supervise PhD students. Supervision for PhD education is still controlled by the national special committee.

4.3 Studying Style of Students

Before the inception of the Internet, Chinese students basically studied every subject as follows: they read through the related textbook content, attended the lectures, went over the contents what the lecturer taught and consolidated the contents with reading the textbook and finally sat the examination. This is the traditional (passive) study style for almost all students. However, now almost all students can use the Internet to browse what the lecturer has taught and get much more information about what they are studying, because many teaching materials (including lecture slides) are available on the Intranet of the University. At the same time, they can use the information found on the Internet to prepare for their assignments, even for their thesis. This changed situation brings a fundamental benefit for students so that they can actively search for what they like to know in the context of the related subject from the Internet and therefore broaden their perspective.

It should be noted that staff and students can read all available materials on the Internet in Chinese, because almost all news happened in the world can been instantly translated into Chinese. There are various forums in Chinese available on the Internet such as education, science and technology. The attendees of these forums are Chinese and foreigners knowing Chinese from every corner of the world. Further, almost all students begin to learn English as secondary language in primary school.

4.4 Teaching Style of Lecturers

Before the inception of the Internet, a Chinese lecturer basically transferred the information contained in the textbook or a few related textbooks to students that s/he taught with the designated time and content arrangement. Because the textbook was only updated once every a few years or more, it was difficult for a lecturer to teach the students up-to-date knowledge. However, now almost all lecturers can use the Internet to know current developments of interest in teaching. S/he can also browse the Internet to search for information of interest. In particular, for fast changing fields such as computer science and technology, lecturers eagerly use the Internet to familiarize themselves with the advances in interesting fields.

On the other hand, the lecturing method of one mouth and a piece of chalk is over. Instead, the lecturer must prepare various multimedia courseware as lecture presentation materials, which is both an opportunity and challenge. The opportunity is that the Internet and Web technology forces lecturers to adapt themselves to new technology and to use it in their teaching activities. The challenge is that lecturers find it difficult to learn new technology in a short time. Further, some lecturers are more accustomed to traditional lecturing methods. With the development of the Internet and Web technology, more and more lecturers have begun to use multimedia courseware as one of the important instruction media. In order to apply Internet and Web technology effectively in teaching activities, Hebei Normal University (HNU) installed many multimedia theaters and cyber rooms. The university requires all lecturers to be familiar with using resources on the Internet and the Web. In fact, many lecturers have directly used the resources of the Internet and Web in their class teaching. Multimedia with Applications, Creating Courseware, and Teaching with the Internet are listed as the three compulsory subjects for any students enrolled at HNU. HNU also uses the Internet and
5 Web education in China

Web education is an education with Internet/Web-based instruction media [6]. It is an extension to traditional distance education with TV, or radio as the instruction media [8]. The advantage of Web education over traditional distance education is that the student can use the Internet and the Web to study the knowledge actively [6][8]. S/he can have more flexibility in arranging the study activity.

A university based on Web-education is called a cyber university or Web college in China [3]. Basically speaking, a Web college is rooted in the adult education college of a university. For example, Beijing University has a Web college. There have been 67 Web colleges in China [8]. In other words, 67 universities in China have been permitted to offer some undergraduate or postgraduate courses which are based on Web education.

Web education was introduced in China in 1998 [6]. Till March 2001, Web colleges enrolled 65,000 students for studying Web courses at diploma undergraduate/postgraduate level.

From Table 1, we can come into the following conclusion: The first three items are those which most concern a student when s/he chooses a Web college, which is similar to why s/he chooses a traditional university. In other words, the development of a Web college is heavily dependent on its attached university. An independent (new) Web university does not yet exist in China. Therefore, Web education in China is a complementary part of traditional distance (higher) education. The Internet and the Web are considered as a new kind of instruction media to add in the university activities.

Furthermore, China has a complete network of RTV (radio and TV) university systems, established in 1978, which mainly use radio and TV as instruction media to offer diploma courses and other non-degree courses. More specifically, at a national level there is a TV university, the Central TV University (see http://www.crtvu.edu.cn/). At a provincial level there are 44 RTV universities (each province has a RTV university). At a district level there are 841 branches of the provincial level RTU universities. Besides, there are 1742 county-level work groups (WGs) supporting the work of RTV universities. All these universities/branches/workgroups constitute a modern open, national distance education system network with a uniform but hierarchical arrangement and administration, as shown in Fig. 1.

Since 1978, this RTV university system has trained more than four million diploma graduates with an excellent social reputation. With this system network, the RTV system has also offered Web education since the end of the last century. Till March 2001, it has enrolled 180,000 students for studying Web courses at diploma/undergraduate level [6]. Therefore, the RTV system will also play an important role in Web education in China in the near future.

<table>
<thead>
<tr>
<th>Concerned item</th>
<th>Numbers</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Reputation of university</td>
<td>928</td>
<td>20.94</td>
</tr>
<tr>
<td>Strength of teaching/ research</td>
<td>1119</td>
<td>25.25</td>
</tr>
<tr>
<td>Importance of academic degrees</td>
<td>1216</td>
<td>27.44</td>
</tr>
<tr>
<td>Tuition fees</td>
<td>533</td>
<td>12.03</td>
</tr>
<tr>
<td>Specialty</td>
<td>637</td>
<td>14.37</td>
</tr>
<tr>
<td>Total</td>
<td>4917</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1. What is the most concerned for choosing Web colleges

When choosing a Web college, a student still pays more attention to the features of the corresponding university in which the Web college is rooted, such as the reputation of the university, the strength of teaching and research forces, the importance of the academic degree in society, tuition fee and specialty [4]. For example, online statistical analysis investigated what the student is most concerned about when s/he chooses a Web college [4] (at 08 January 2004). More than 4000 participants completed an online questionnaire. Their responses are summarized in Table 1.
6 Some Issues in Applying Web Technology in Higher Education in China

In this section we will examine some issues which remain in applying Web technology in higher education in China.

Although the Internet is, technically, international in scope [11], the use of the Internet and Web technology in China still lags that in the developed countries such as that in the USA, because of communication costs, and the price of a computer, which is still not personal in China, in particular for students in universities. However, almost all academic staff members can now access the Internet, and gradually have begun to use the Internet to search for information on the Web and use e-mail to communicate with others. The internet communication speed is still so low [13], that some staff members sometimes stop attempts to search for information of interest on the Web.

The communication via e-mail is basically domestic for many academic staff members. Language and cultural differences between China and Western countries are a big issue so that communication via e-mail in English still requires courage and spirit in China. This situation is also gradually changing, because English has become a compulsory subject from primary school to university (till postgraduate study). Therefore, more and more Chinese students and academic staff members can contact with others in other countries via e-mail in English.

Hebei province has 67 million people and 47 higher institutions, 9 of them are universities (http://www.edu.cn/HomePage/jiao_yu_zi_yuan/list.php?listid=153), while Australia has 19 millions people and 41 higher institutions, 37 of them are universities. (http://www.detya.gov.au/highered/ausunis.htm). In other words, ten million people in Hebei share 1.3 universities, while ten million people in Australia share 20 universities. This result implies that there is still a long way to go for Hebei, and China to catch up the development level of higher education in Australia or other developed countries. Furthermore, the strong social requirement for higher education can not been met in China in a short time. With the development of the Internet and the Web, the Chinese will find that such a difference and requirement will affect not only the economic development but also the social development of China. Therefore, how to use the Internet and Web technology to improve the studying and teaching style in higher institutions and relieve the social requirement for higher education is a big issue [6]. In this case, Web higher education will become an important complementary part for developing academic degree education carried in traditional universities [6] in order to increase the number of students that obtain their academic degrees after years’ study at a Web college. Another big issue is how to increase the number of universities in China and at the same time to make the distribution of universities in China uniform.

7 Concluding Remarks

In this paper we examined Web technology in higher education in China. More specifically, we overviewed the development of the Internet and Web technology in China, and examined the application of Web technology in higher education in China. We also investigated the influence of Web technology on development of higher education in China from both a micro viewpoint and macro viewpoint. Furthermore, we discussed the Web education development in China. Finally we examined some issues in applying Web technology in China. We argued that with economic development in China, the Internet and Web technology will improve the studying, teaching and research style in universities at a micro level, and improve the understanding of universities in developed countries and promote the development of higher education in China at a macro level.

References

[5]. http://www.crtvu.edu.cn/