

# Continuing Education in Chinese University Libraries: Issues and Approaches

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The changing educational environment in China requires new functions for university libraries, and these functions demand that librarians possess different skills and talents. The quality and skills of university library staff are decisive factors for the development of both librarianship and national education in China's digital and networked environment. On-line distance learning is playing a more and more important role in improving both the theoretical knowledge and practical ability of practitioners in LIS. In China, over 40,000 staff work in more than 1,000 university libraries, but

the lack of staff with professional education in some libraries should be recognised and continuing education offerings need to be strengthened. In this paper, the current situation is introduced, some major cases are described, and issues faced by most university libraries in professional education at all levels are analysed. Suggestions are put forward on how to expand the scope of education, and how to utilise the networked environment to supply e-learning to library staff to improve their ability in organising information resources and in providing higher quality information services.

## Introduction

In China, university libraries, together with public libraries and science & technology libraries, constitute the majority of the six systems in the library and information (LIS) field (Table 1). University libraries play an important role in supplying information resources and knowledge for the development of the economy, education and culture, as well as promoting social progress. Generally, university libraries bear responsibility for supplying information resources and intellectual support for educational innovation in China. They are growing quickly in both the volumes in their collections and the number of personnel. According to statistics, the number of university libraries in China in 1978, 1980 and 1997 was 598, 675 and 1020 respectively; the collections in 1980 and 1997 numbered 194 million and 469 million, while the number of library staff in 1997 reached 41,300 (Feng 2002).

Table 1. Three main library systems in China

System	No. of libraries	No. of librarians	Vol. of collections	Year of latest data
Public library	2,697	48,500	426,000,000	2002*
University library	1,020	41,300	469,000,000	1997**
Science & Technology library	9,000	88,900	1,060,000,000	1994***

Sources: \* (China Society of Library Science, 2004) \*\* (Feng, 2002) and \*\*\* (L. Wang 1999, 446)

Basically university library staff in China comprises professionals who graduated from LIS schools or departments, others who have some other subject background, and ordinary workers dealing with the physical work in the library, such as book mending, bookbinding, printing, etc. In terms of academic status, more than half of the staff have undergraduate diplomas, while a few have Masters Degrees or PhDs. Hu (2004, 218)

Table 2. Staff number and academic status in 58 academic libraries in Guangdong (Hu 2004)

No. of Staff and Workers (total 2142)			Academic Status (among 2142)		
Regular employees Staff	Workers	Casual laborers	Postgraduates (Masters & PhD)	Undergraduates (Bachelor) & Junior College Students	Technical School Students
1662 (76.1%)	396 (18.5%)	84	96 (4.5%)	1572 (73.4%)	213 (9.9%)

provides data on the number and academic status of the staff of the libraries in the 58 universities in Guangdong Province in South China (see Table 2). This data may be representative of employment patterns nationally.

Although LIS education in China has improved greatly in recent years, a serious mismatch between supply and demand for LIS professionals still exists. Cheng (2004) pointed out that from information published in *China Library Yearbook 2003* it can be seen that China now has 30 LIS schools or departments for undergraduates, 21 teaching units for postgraduate students, and 6 for Ph.D. scholars. In 2001, only 451 LIS undergraduates graduated from 19 schools or departments. In the same year, 49 postgraduates completed Master Degrees and 13 graduated with Doctoral Degrees. However, not all of them chose libraries as their careers. Consequently, most libraries in China lack professional staff members who have graduated from LIS schools. This provoked the comment by Professor Ma (1999), the former director of the Shanghai Library, that

In Shanghai Library, among the professionals, only 49.4% are graduates with LIS certificates, and the total number of professionals with LIS and humanity certificates accounts for only 74.4% of the whole. How can such staff expertise be the basis for meeting the needs for the development of librarianship in the Twenty-First Century? [1]

Things are very similar in university libraries in this respect. According to Li's (2003) survey of more than 40,000 library staff in academic or technical posts, 3,700 are advanced research librarians (equal to professor and associate professor) and make up 9.7% of the total number; 12,000 librarians (equal to lecturer) make up a further 30%; while 14,000 assistant librarians

(equal to assistant or tutor) make up 38%. Although these numbers and proportions increased year by year, compared with the high demand for LIS and subject professionals to cope with the fast development of university libraries, the increase is far short of meeting the needs. This is further evidence that there is an urgent need for libraries to train and educate their staff not only with basic knowledge on LIS, but also with the subject knowledge and professional skills needed for keeping up to date.

Commenting on the lack of LIS personnel, Zhan (2002), a Professor in the Information Management Institute of Wuhan University, also noted that the inadequate number of students and insufficient teaching staff are a cause for concern in LIS education and need to be considered more widely.

### *New environments faced by university librarians*

In recent years, educational reform and the application of new technologies have been bringing many changes to teaching, studying and research, creating a new environment for university libraries and new challenges for the librarians mainly in the following three aspects, all of which require librarians to have relevant capabilities and skills.

- The expansion of both student recruitment at undergraduate and postgraduate levels and subject or course provision in disciplines that are urgently needed for national development such as economics, life sciences, finance, law, etc. requires university libraries to increase their collections and resources; to use appropriate information technology to acquire, organise and disseminate information in different formats; and to provide resources and media through cooperative professional activities.

- The improvement of teaching methods in universities and colleges requires their libraries to provide appropriate information, resources or instruction to support the stated educational goals of the university and to satisfy the needs of individuals and groups; to promote and develop the effective use of information; and to manage and evaluate the library services they provide.
- The application of new technologies, such as CDs, multi-media, Personal Computers and access to the Internet, in university libraries, especially the construction of digital libraries at different levels – locally, regionally or nationally – requires university libraries to adopt the most advanced Information and Communication Technologies to meet their needs. In China, the third generation of digital libraries are under construction now, developing a physical environment in which new technologies for organising knowledge, facilitating access to information, and supplying live reference services have been and will be even more widely used.

### *New functions of university libraries*

With the rapid growth of digitisation of learning resources, networking of teaching, and internationalisation of academic exchange, university libraries are entering a new educational environment, and are changing into academic research institutions. In addition to supporting teaching, they are expected to have the capability to support faculty members that are undertaking academic research at a high level in a variety of subjects and tutoring people with high abilities. To contribute to these goals, university libraries must expand their teaching function to assist in the development of not only their own staff but also to improve the independent study skills of the university's students. This gives university libraries three new tasks.

#### *Academic research support centre*

Scientific research is emphasised as an important task for university faculties serving China's economic development and social progress. Now, World Wide Web resources offering ease in transmitting, accessing and sharing information are becoming major resources for university faculties in their teaching and research. A survey of academics in China in 2002 found a very high demand for specialised subject Web sites, and ranked them as number one of the most needed Internet resources (Zhang 2004).

According to a news release in March 2004 (Xu 2004), some e-institutes based on the concept of e-

science are now emerging in China. For instance, in 2003, 6 e-institutes were set up in Shanghai universities or colleges, which took grid (a net technology), [2] computing science, immunology, biomedical modelling, urban culture, and sociology as their main subjects for study and research, and aimed at establishing a set of research bases on natural science and humanities and sociology. The Internet will be fully utilised for integrating resources and exchanging research results among experts and scientists not only in these institutes, but also in the region, in the whole country, and even globally. So, opening up and organising networked teaching and academic resources are becoming a major task for these university libraries.

#### *Assistant teaching centre*

During and since the 1980s, most of the university libraries in China have set up teaching branches to give their students lessons on literature retrieval. With the emergence of the networked learning environment, these lessons are being changed into Information Literacy education and notable progress has been achieved in some libraries. In 1999, during the course evaluation in East China Science & Engineering University, the course in "Information Literacy education" given by the library was awarded the highest score in the university, and subsequently was listed in core lessons for Shanghai universities. In addition, a few university libraries have been approved for teaching postgraduates in LIS. The earliest ones were the Library of Renmin University of China, which began to recruit students for its Master Degrees in LIS in 1994, and Shanghai Jiaotong University Library, which the Ministry of Education approved to award LIS Master Degrees in 1996. Their Masters Degree programmes enrol LIS undergraduates or graduates with other subject backgrounds and, as well as the library's own staff, staff members from various parts of the country with Bachelor Degrees. The programmes are usually 2 to 2.5 years of full-time study. The major courses offered by these two libraries follow in Table 3.

Each year since the mid 1990s, 4 or 5 postgraduates complete the study programme at each of these two libraries with the award of a Masters Degree.

Table 3. Main courses for postgraduates offered by LRUC and SJTUL

Library	Main Courses
<p>Renmin University [1]                      (Faculty: 4 professors and 10 associate professors from the Library and the Information Resource Management School.                      Main Research Orientations:                      1. Theory &amp; practice for digital library                      2. Theory &amp; methodology for social science information                      3. Management of library modernization                      4. Information resource management                      5. Information retrieval skills)</p>	<p>Organisation &amp; utilisation of Web resources                      Theory &amp; methodology on SS information                      Study on information users                      Library automation management                      Theory &amp; practice for digital library                      Information policies and regulations                      Information retrieval languages                      Special English (English in LIS subject)</p>
<p>Shanghai Jiaotong University [2]                      (Faculty: 3 professor librarians and more than 10 associate librarians.                      Main Research Orientations:                      1. Academic methods and applications of Competitive Intelligence                      2. Net-resource retrieval skills                      3. Automation of information management)</p>	<p>Analysis &amp; research on information                      Information retrieval system                      Modern information technology                      Auto-system for information management                      Competent information &amp; KM for enterprise                      Distributing operation system                      Database Technology                      Computer networks                      Managing information system</p>

Notes:

1. Available at URL - <http://www.lib.ruc.edu.cn/jxyyj/jxyyj-yjs.htm> [Viewed December 5, 2004]
2. Available at URL - <http://www.gschoo1.sjtu.edu.cn/oldsite/train/master> [Viewed December 5, 2004]

*Cultural entertaining centre*

With the rapid implementation of automation for the operation, management, and networking of information resources for user services, and the construction of an information infrastructure in China, some university libraries began to provide public services to external users in recent years. Some examples include:

- Supplying citizens with services such as inter-library loan and consulting for individuals or companies on new programmes or projects they are interested in.
- Opening the university library with its rich collections to citizens to offset any insufficiency of resources in the local public library. For example, in 2002, although there are 26 public libraries in Beijing and 32 in Shanghai, the population of the two cities was 14.56 and 13.34 million respectively. In China, there are now nearly 40 university libraries with collections over 1 million volumes that can be fully utilised by external readers (Feng 2002).
- Answering questions asked by users from various parts of the city remotely through live reference services, etc. In Shanghai, some university libraries such as Shanghai Jiaotong University, Fudan University, East China Normal University, and Tongji University have joined in a digital reference service program called "Network Knowledge Navigation of Shanghai Libraries." [3] The subject areas covered by this service

include social science, language, religion, chemistry, education, psychology, etc.

University libraries have the capacity to expand their public service functions as most have had new or extended buildings and many have established e-reading rooms for supplying users with e-books or e-journals, and multimedia resources. Opening to external readers and joining community cultural activities are surely becoming the future trends. Cao (2002) pointed out that, as university libraries are located within a certain community, the campus wall cannot get in the way of closer contact with communities around them. So, besides serving their users on campus, university libraries are expected to provide necessary social services through cooperation with public libraries.

*New skills and talents for university librarians*

To face this new environment, university librarians need to have new skills and talents to do their work well. With the coming age of the knowledge-based economy, knowledge has become the most important resource for economic development of

### *Application of e-learning in LIS continuing education*

society. Academic librarians must be knowledge managers and navigators. According to Xue (2003), a lecturer in the Information Management Department of Peking University, the following are the basic knowledge academic librarians need to master:

1. Library and information science: the basic knowledge covering Library Science, Information Science, Informatics, Taxonomy, Cataloguing, and Computer Science, etc.
2. Basic knowledge on a certain subject or discipline including fundamentals of Social Science, Natural Science, and Liberal Humanities, and also includes knowledge on sociology, psychology, pedagogy, etc. relevant to information services.
3. Operations in academic libraries rely on modern information technology such as digital technology, networking, multimedia, database management, etc. Not only technicians, but also librarians should be familiar with the basic operations and maintenance of IT.
4. Since academic exchanges tend to be more and more internationalised, reading foreign language documents and materials are becoming the major channel for acquiring information. The level of competence in foreign languages affects the ability to utilise published information and services provided by Chinese academic librarians, and they should have the ability to read documents and other materials in a foreign language (especially English).

At the same time, he suggested that they should have the following professional abilities or skills:

1. A deep knowledge of the library's resources, including its traditional collections, digital collections, and virtual collections;
2. Sensitivity in acquiring information: having expert knowledge in evaluating both on-site and remote learning resources to support the instructional programme and a knowledge of the current education framework so as to forecast, analyse and access information on various subjects or disciplines accurately, appropriately, and quickly;
3. A concern for the ethical concept of protecting intellectual property rights;
4. An ability to understand and communicate well with the entire academic community – teachers, administrators, and other staff – both to extend their general understanding of information issues and to develop sophisticated skills in information literacy;
5. A capacity for studying user's thoughts or reflection, and understanding their potential requirements: collaborating with students and other members of the learning community to analyse learning and information needs, and to locate and use the resources that will meet those needs.

Traditionally, university librarians in China receive continuing education mainly in two ways: on-the-job-training or regular education provided by correspondence courses. Most libraries provide on-the-job-training in the form of training lessons, refresher courses, research classes, discussion lectures, etc. During the past two decades, over 15,000 graduated from the correspondence courses. Between 1980 and 1990, 6,000 were graduated from those courses offered by Peking University and Wuhan University, the most famous universities for LIS education in China (H. Wang 2002). However, these figures can hardly meet the needs for the rapid development of librarianship or respond to the growing body of knowledge about LIS.

The issue of the urgent needs of LIS professionals has already been given attention in both educational and practitioner circles. In recent years, papers discussing these issues have often appeared in LIS journals. Scholars give many concrete suggestions on how to improve the quality of LIS continuing education, and some have made surveys to find new ways to improve the efficiency of education. One of the best ways forward in continuing education for LIS staff is to make further use of e-learning, already widely used in training professionals in many enterprises, and widely used in LIS education in China because of its many superior features. Rich resources for learning already exist in the networked environment. A wide range of teaching software, discussion groups, news services, etc., has been assembled in a highly integrated repository convenient for users to access.

On the homepage of "Lib-teach", [4] run by the Association on Research of Information Literacy Education of Beijing, one can find information on Postgraduate Education and Library Users' Education in Beijing, as well as Life-long Education for Librarians. This site integrates educational resources from 15 university libraries in Beijing including Peking University, Tsinghua University, Beijing Normal University, Chinese Agriculture University, etc. Besides news on recruitment, lists of courses, on-line references, teaching materials on retrieval of information on various subjects such as Social science, Engineering, Biological

Fig 1. Cost curve of e-learning

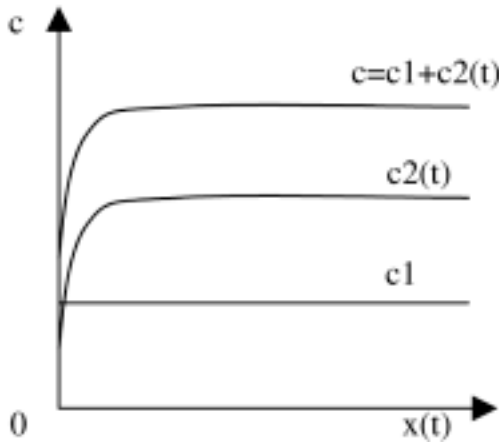
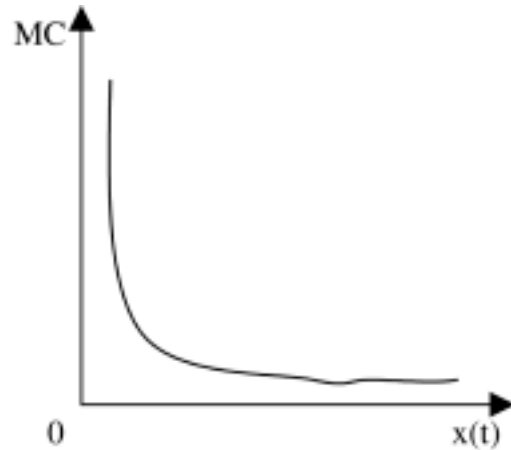


Fig 2. Marginal cost of e-learning



agriculture, Economics, Education, Chemistry, Literature & arts, Computer technology, etc., there are also e-journals and a discussion forum for university librarians to publish papers and to express or exchange views on hot issues.

Zhang (2002), a lecturer in the Management Institute of Fuzhou University, has argued that the cost tends to be lower as the number of learners who choose e-learning increases. As a result, the marginal cost of teaching tends toward zero, as illustrated in Figures 1 and 2.

In his discussion, Zhang supposed the initial cost of establishing an e-learning network and preparing courseware to be  $C_1$ ; the cost of renewing courseware and maintaining the Web site to be  $C_2(t)$ ; and the number of educated persons is  $X(t)$  (where  $t$  means time, that is the maintenance cost and number of consumers are both dynamic variants of time); while the total cost  $C = C_1 + C_2(t)$ . According to the formula, as time goes on, although the maintenance cost  $C_2(t)$  increases, the price for Information Technology products always goes down while the quality improves, and so,  $C$  increases slowly, while with the popularity of networks, the number of learners taking advantage of e-learning goes up quickly. Besides the above, there are other circumstances encouraging the application of e-learning in continuing education for LIS staff in China.

Firstly, with increased use of the Internet, people are generally more aware of e-learning. According to statistics gathered by the China National Network Information Center (CNNIC) in July 2001, about 54.7% of the respondents believe that

networked education is the most competitive one for a networked enterprise, and 33% intend to enrol in on-line learning. It is said that, in the Chinese market, corporations or enterprises will spend US\$23,000 million in on-line education or training in the year of 2004. The number of universities and colleges supplying distance education reached 67 in 2002, an increase of 22 compared with the previous year. It is anticipated that the number of students enrolling for on-line learning will reach 5 million in 2005 (R. Wang 2002).

In order to train users to effectively use on-line learning resources, some LIS institutions provide lessons, such as “The retrieval and applications of the electronic resources” offered by Peking University Library, through which learners can get both knowledge and experiences on how to search and access what they need from databases and on Internet. [5] Other training resources that can be utilized by users include computer-aid teaching software, on-line users’ guide, etc. supplied both home and abroad.

Secondly, there have been improvements in the networked environment in China. Between 1996 and 2000, the Chinese government put a great amount of money into the information infrastructure, mainly into construction of the information network. As a result, the Internet grew rapidly in China during that period. According to surveys carried out in 1998, 1999 and 2000 by CNNIC, the number of computers on the Internet, the number of net users and the overall international line capacity increased annually (Tables 4, 5 and 6) (Huang et al. 2002, 101–102)

Table 4. Number of computers on net from 1998 to 2000

	1998	1999	2000
Special line	117,000	410,000	1,410,000
Dial-up	630,000	3,090,000	7,510,000
Total	747,000	3,500,000	8,920,000
Increase/Year (%)		368	154

Table 5. Number of individual net users from 1998 to 2000

	1998	1999	2000
Special line	400,000	1,090,000	3,640,000
Dial-up	1,490,000	6,660,000	13,540,000
Both use	210,000	1,150,000	3,430,000
Total	2,100,000	8,900,000	22,500,000
Increase/Year (%)		323	152

Table 6. Total international track capacity\* from 1998 to 2000 (Unit: MbPS)

	1998	1999	2000
China Science & Technology Network (CSTNET)	4	10	55
China Internet (CHINANET)	123	291	1953
China Education & Research Network (CERNET)	8	8	117
China Golden Bridge Network (CHINAGBN)	8.25	22	148
China Unit Internet (UNINET)		20	55
China Network Communication Network (CNCNET)			377
China International Economy & Trade Network (CIETNET)			4
China Mobile Internet (CMNET)			90
Total	143.25	351	2799
Increase/Year (%)		145	697

\* Track capacity means the quantity of data passing through in a second.

Table 7. Construction of digital campus in 5 universities or colleges

University or college	Optical cable (km)	On-line computers (set)	On-line multimedia classroom (seat)	Teaching center for distance education
Peking University	92	21,000	8,000	35
Tsinghua University	100	27,000	6,000	128
Shanghai Jiaotong University	In 5 campuses	15,000		16
Southwest Normal University	18			23
Zhongshan University	75	18,000	70	20

Source: Wan et al. 2004.

Alongside these developments, the network environment in university institutions in China has also been improved greatly. The first skeleton network, China Education and Research Network (CERNET), has already linked more than 4,000,000 users in 700 universities and institutes in 140 cities (Zheng 2003). Inter-connection of satellite networks with CERNET forms an advanced distance educational network with alternative functions and greatly expands its educational potential, both in time and space. In addition, the construction of a digital campus is under way in many universities or colleges (see Table 7).

In another important development, the Chinese E-learning Technology Standard (CELTS) was issued in February 2002 by a drafting committee established by the Science and Technology Department of Ministry of Education. This proposed a total framework covering 27 standards that took the IEEE as their reference point (R. Wang 2002).

From the above, it is clear to see that the library staff is more and more involved in a new form of study, and there is therefore a huge market for supplying continuing education for LIS staff in China emerging today.

### *Issues needing to be resolved*

Some Chinese LIS scholars and educational workers have begun to give special attention to e-learning. Professor Zhang Xinian and Zhan Deyou (2001) from the Information Management Institute of Wuhan University pointed out that

On-line distance education is a new model for the 21<sup>st</sup> century education. It not only meets the need for life-long education, but also improves teaching greatly, and will become the trend for development in information society.

However, the following issues on how to apply e-learning to continuing education for LIS staff need to be solved as soon as possible.

Firstly, improving the qualification of LIS professionals in China should not be seen as a transient task. The concept of life-long learning needs to be stressed and insisted on among university librarians no matter what qualification they hold (LIS undergraduate, Master, or PhD, or a subject background) and no matter what position they hold (director, senior professional or librarian). Toward this end, the concept of "life-long learning" should be advocated. This is desirable to give continuing education for librarians a definite status in the whole process of lifelong learning. Through e-learning, university librarians can learn what they need anytime and anywhere (in their library or at home) and finally realise the goals of developing their basic knowledge and professional skills and maintaining and enhancing their capability to compete in a changing environment.

Secondly, it is reported that in the world today over 60 countries have their own library laws or bylaws in which items relate to continuing education for LIS staff (Y. Wang 2002). In China, there is a need to speed up lawmaking on continuing education for LIS staff. However, a draft "Library Law of China" has already been completed and is now being discussed prior to its final release. The China Society for Library Science is a constituent part of the system framed in this legislation, and enacted its *Guidelines on Professional Conduct for Chinese Librarians* (draft) in the year 2002. In Chapter 7, "Professional Literacy of Librarians", it stresses life-long learning. It stipulates that every librarian has the responsibility to learn for the whole period of her/his life and study intensively, and also has the right to have on-the-job-training or paid leave to take courses. Of course, to facilitate and encourage this, the definition of professional positions and a promotion system for librarians needs be set up first.

Thirdly, it is important to investigate new modes of continuing education for LIS staff. Broadly speaking, e-learning covers all kinds of study by means of e-technology, but the most popular e-learning at present means distance education both for formal schooling and e-training. In China, based on current conditions and the digital environment mentioned above, there are two ways that could be considered for effective application of e-learning in continuing education for LIS staff.

One way would be to establish a virtual institute to supply a complete teaching service through

utilising the existing LIS education system. Some LIS institutes have already begun to cooperate with the China Distance Education Centre toward this, such as Tsinghua University Library. Based on the advanced information and telecommunication technology of Tsinghua Distance Education Centre, they opened up "Net Classroom" to supply basic courses on computer, networking, etc. and in 1999, Shanghai Jiaotong University Distance Education Centre set up an undergraduate course "The Retrieval of Sci-Tech resources", which aims to help users make best use of library and its vast information resources, gain the basic techniques of retrieving information for their academic & scientific research (Li 2000). Others have already created courseware and are supplying distance courses on-line. For instance, Chinese National Sciences Library offers Web Schoolroom on its homepage. [6] After registration, learners can browse courseware and select tutorials.

Another way would be to use the superior resources of university libraries in computer equipment and professionals to open up distance courses for librarians. Some examples are illustrated in Table 8. As to the course content, subjects and levels for librarians with various discipline backgrounds and educational level still need further consideration. Li (2000) also suggested that university libraries should cooperate with the China Distance Education Centre, the associated Web sites, academic institutions, public libraries, as well as computer schools and publishing houses to establish a comprehensive virtual university, to expand distance education.

Fourthly, there is a need to establish an authentication system for qualifications from e-learning. At present, qualifications for Chinese university librarians can be gained from correspondence courses or by self-study test. To supply large number of librarians with e-learning and to meet the urgent need for skilled professionals in university libraries, a national approval system for qualifications from e-learning should be established first. This would be helpful in encouraging more librarians to choose e-learning for further study and ensure their promotion of position with certificates or diplomas from this kind of learning mode.

Finally, Chinese librarians need to consider utilising existing on-line Web courses. For exam-

Table 8. Examples of network education platforms and courses for undergraduates and postgraduates

Institute	Website	Major Courseware	Hours
Peking University Library - Web-course	<a href="http://www.lib.pku.edu.cn/fuwu/fuwu_wlkc.htm">http://www.lib.pku.edu.cn/fuwu/fuwu_wlkc.htm</a>	Retrieval and applications of electronic resources Doing English digital	24 months
Beijing Normal University - Manage	<a href="http://www.bnumanage.com/index-ketang.asp">http://www.bnumanage.com/index-ketang.asp</a>	Information retrieval* Information conomics* SPSS software application* Intranet strategy & practice*	16.5 18.5 10.5 9
Peking University IM Department - Courseware	<a href="http://www.im.pku.edu.cn:88/index1.asp">http://www.im.pku.edu.cn:88/index1.asp</a>	Retrieval and applications of information resources for Chinese literatures Professional English	36
Library, Wuhan University - Web-course	<a href="http://www.lib.whu.edu.cn/#">http://www.lib.whu.edu.cn/#</a>	Information management system Information resource management	3 3

Note: Courses with \* mean training for acquiring postgraduate or Master's Degree; others are for Bachelor's Degree

ple, Table 9 gives the available course groups offered by OCLC Institute which may be used by librarians all over the world. Learners can choose more than 600 on-line technical courses. OCLC offers annual subscriptions to them in 4 course groups.

The above courses could be bought for the entire staff of a library, a library system, or a consortium of libraries, and annual licence fees at this price are affordable by most large Chinese library systems. However, it is important to note that these, and other courses available online, may require a command of a foreign language (often English) at a level beyond the capability of many Chinese librarians.

### Conclusion

E-learning is becoming a significant feature of education and training for librarianship and information sciences and presents new opportunities for staff development by Chinese libraries but also new challenges for China's Schools of Librarianship and Information Sciences in pedagogy,

Table 9. Available course groups offered by OCLC Institute

Curriculum	No. of Subjects	Annual licence fee (US \$)
End User Desktop Computing	185	59.95
Technical General	223	119.95
Technical MCSE	197	119.95
Technical Web Development	124	119.95

resource support, and marketing. The significance of the application of e-learning in LIS education in China is evident. It is helpful not only in meeting the needs of continuing education for LIS professionals, but also in assisting libraries to develop a workforce of fully qualified librarians, so as to improve the level of services totally. E-learning also impacts on Chinese library services in terms of their provision of learning resources and reference service, creating increasing pressure for electronic services. Facing the challenges brought about by e-learning and adapting themselves to transformation in both the concept and modes of learning, Chinese librarians should strengthen their ability for utilising this new mode of learning. The first requirement is that librarians should have a basic knowledge of computers and networks. They then can learn how to retrieve, handle and exchange information on the Internet. They may also need to improve their grasp of foreign languages. Statistics show that the languages currently most used on the Web are English (84%), German (4.5%), Japanese (3.1%), and French (1.8%) (Diao 2002). So, English is very important for Chinese librarians not only to learn using training courses provided on the network but also to access resources on Internet.

### Notes

1. Author's translation.
2. Gridforum available at URL: <http://www.gridforum.org> [Viewed 1 February 2005]

3. Available at URL: <http://zsdh.library.sh.cn/ask/ask.asp> [Viewed 18 February 2005]
4. Available at URL: <http://edu.lib.tsinghua.edu.cn/SiteMap/index.htm> [Viewed 1 February 2005]
5. Available at URL: <http://www.lib.pku.edu.cn/is/eaccess/homework.html> [Viewed 1 February 2005]
6. Available at URL: <http://www.csdl.ac.cn/ejournal/SPT--Guide.html> [Viewed 1 February 2005]

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