



United Nations
Educational, Scientific and
Cultural Organization



UNESCO Institute
for Information Technologies
in Education

Chunyan Wang and Guodong Zhao

Open Educational Resources in the People's Republic of China:

Achievements, Challenges and Prospects for Development



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Foreword

Since 2009, the UNESCO Institute for Information Technologies in Education (IITE) has been implementing its project on Open Educational Resources (OER) aimed at promotion of OER in non-English-speaking countries. During the first stage of the project, a survey of the state-of-the-art of OER in Armenia, Azerbaijan, Belarus, Kazakhstan, Moldova, the Russian Federation, Ukraine, Uzbekistan, and two Baltic countries - Latvia and Lithuania - was completed. The results of the cross-national survey of OER in the Commonwealth of Independent States were published in the monograph "CIS on the Way towards OER". At a later stage the geographical scope of the IITE survey expanded to include Japan, People's Republic of China, Brazil, Turkey and Vietnam in order to provide further insight into the diversity of OER-related patterns in these countries. The studies "Open Educational Resources in Lithuania" by Airina Volungevičienė and "Open Educational Resources in Brazil: State-of-the-Art, Challenges and Prospects for Development and Innovation" by Andreia Inamorato dos Santos opened the series of case studies summarizing best practices in OER. A new publication in this series, the study on Open Educational Resources in the People's Republic of China was prepared by Chunyan Wang and Guodong Zhao.

Based on the review of relevant academic research, the case study revises the concepts related to open educational content as applied to the Chinese context. The authors analyze the technological prerequisites for the use of ICT in the higher education of China and consider the evolution of the government policy related to the promotion of OER. It is the governmental and institutional support backed up by the enthusiasm of educators that ensured successful implementation of such ambitious projects as the Chinese Quality Course Project, the China Open Resources for Education, the National Science Data Sharing Project and other major OER initiatives described in the report. In addition to the introduction of the legal and copyright perspectives with regard to OER, the study contains a summary of solutions proposed by the Creative Commons China Mainland. Recognizing the importance of OER for solving the challenges faced by the national educational system, the authors examine educators' attitude towards OER, the obstacles preventing a wider development and use of OER, and the measures to be taken in such spheres as financing, technology and infrastructure, quality assurance and sustainability, public awareness and promotion, pedagogy, etc. We believe that their suggestions formulated as a result of a thorough analysis of the Chinese experience should be helpful for many other countries that have started their way towards the introduction of OER in educational practices.

Dendev Badarch
UNESCO IITE Director a.i.

Preface

While the Open Educational Resources (OER) movement trails its way in China, scholars and researchers in the fields of education, copyright law, computer science and network technology are paying more and more attention to this new undertaking. Numerous publications focusing on OER analyzed or introduced nearly all aspects of OER, including its history, background, prospect and technological and copyright solutions. However, the existing publications mostly deal with one or several aspects for the OER movement or a specific programme (most often the Chinese Quality Course Project and the China Open Resources for Education). Comprehensive studies of the entire Chinese OER movement are currently unavailable. There are no publications on the barriers and obstacles faced by OER producers, no analysis of the overall situation and solutions.

This report sums up the existing publications on the Chinese OER movement and provides results of an analytical survey and statistical research to present the state-of-the-art, challenges and prospects for the development of OER in China. It reviews educational theories, technological solutions and laws and regulations concerning OER to outline advantages and problems of the Chinese OER projects and to describe possible future obstacles. The report describes the approaches, copyright issues and management issues of the most successful OER initiatives in the People's Republic of China. Finally, the report provides solutions for the most frequent problems and analyzes the prospect of OER in China.

This study makes use of available publications and statistics on certain OER projects. As for the ICT infrastructure in P.R. China, this report compiles a survey based on the statistics provided by the China Internet Network Information Centre, the state network information center of China. For statistics representing the current situation with access to and impact of OER, this report uses the existing spot check results. Those checks were carried out mostly in universities among teachers and students.

As required by IITE, the report also employs the method of case studies to introduce the most successful OER projects in China. Those projects include Chinese open courseware projects, the most influential educational programmes initiated by the state and the most popular Creative Commons sharing projects and repositories.



I. General Background

I.1 Importance of OER

A review of the history of the OER (Open Educational Resources) movement in China since its emergence in this country proves that the introduction of OER in the education has a rapid and stable pace. There is a great number of national projects initiated by the government and numerous volunteer projects operated by enthusiasts.

The introduction of OER is very important to the educational system of the People's Republic of China. According to a statistical report provided by the Ministry of Education in 2007, the number of registered school students (elementary and higher levels) in China was 209 million. With the support of the Chinese government, the promotion of OER among such a large population suggests a considerable impact for the OER movement itself.

The development of OER in China, though prosperous in general, has run into some problems. The problems vary from legal to technical. While funding and technical issues are universal, the hardware issues are relatively more difficult to resolve. Yet, there are also systematic issues such as incentive mechanisms, accessibility of resources, administration, quality control and timeliness of the content.

I.2 Institutional Support

The uneven distribution of educational resources among different regions urged the government to start its OER initiatives. The Ministry of Culture, the Ministry of Education, and the Ministry of Science and Technology provide governmental support to the OER initiatives. Universities, institutes, libraries and other non-governmental organizations are also deeply involved in this movement. There are OER producers among government sections, universities and institutes, and the resources are emerging in every possible field.

I.3 How China Defines OER

According to the Hewlett Foundation, the term "OER" means:

...teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials or techniques used to support access to knowledge.

(Atkins, 2007)

In the context of contemporary China, the term "open education" sometimes refers to distance education or "education with openness" (which is a more pedagogical term closely associated with teaching methods). Some scholars believe that the objective of open education is "socialized education

or lifelong education” (Ling Shirong, 1999), others argued that “open education is ... to deliver knowledge to the general public, without the limit of time and space” (Xue Ximin, 1995).

The term “Open Educational Resources”, since it was officially defined at the Forum on Open Courseware for Higher Education in Developing Countries in 2002, was soon introduced to China and popularized among scholars and educators. In most cases, the term OER refers to freely accessible educational resources, and only in very rare cases it refers to materials designed for distance education (Huang Chuanhui, 2010). The term “Open Educational Resources” is widely accepted by scholars, educators and users of such resources in the People's Republic of China.

In general, the existing publications on OER mostly follow the Hewlett definition. Therefore, in this report we adopt the Hewlett definition with an expansion which covers projects initiated by the government and made open by certain policies. Those projects include, but shall not be limited to, the Chinese Quality Course Project (initiated, supported and funded by the Ministry of Education), National Cultural Information Resources Sharing Project (the Ministry of Culture), and the Science Data Sharing Project (the Ministry of Science and Technology). Also, while Creative Commons licenses have a constantly growing impact on these projects, we can expect that these projects may employ CC as a copyright solution in the future.

I.4 Categories of OER Content

In this context, we classify the OER resources available in P.R. China in three categories as follows:

1) Educational resources that are not protected by the *Copyright Law of the People's Republic of China* (hereinafter “the Copyright Law”), i.e. these resources are in the public domain. Historically, China is quite resourceful in terms of culture and education, and the literary works available in the public domain are abundant. Today libraries and institutes are doing their best to digitize those resources and to make them available to the public free of charge, in a form easily accessible via Internet and other means.

2) Educational Resources protected by Copyright Laws but under provisions which allow for free use and/or re-use. These resources include any educational materials published under open copyright licenses including Creative Commons licenses (hereinafter “CC licenses”) and GPL, GNU licenses. Most importantly, CC licenses were officially introduced in China in 2006, and a number of user-generated-content websites, institutional repositories and collaborative creation communities have adopted these licenses for their contents. A great part of such materials, including popular scientific works, e-preprints of theses and full courses, the copyright status of which is clear, are created for educational purposes. They are mainly provided by the OER projects initiated by enthusiasts, volunteers, institutes and universities.

3) Resources that are not explicitly licensed under certain intellectual property licenses and do not reside in the public domain, yet are guaranteed for free public use by the government policy.

One example of government-supported OER initiatives is the Chinese Quality Courseware (hereinafter “CQC”): the project was initiated and funded by the Ministry of Education of P.R. China, and the copyright for all the courseware produced in the framework of this project was not specified through any form of licenses or agreements. However, the Ministry of Education has clearly declared that for these materials it provided “financial support and demand all of the materials online to be freely accessible by all universities” (*Implementing measures on the Chinese Quality Courses Project*). As it was stipulated by the Ministry of Education and the Ministry of Finance, the *Announcement on Implementation of the Chinese Quality Courses Project (2010)* would provide that “all materials of the courses, as long as they meet defined educational quality standards, shall be posted online without any password to limit accessibility and shall be open to the general public”. Under those provisions by the government, which initiated and funded the OER programmes, it is guaranteed that these educational resources would be free and open to everyone.

I.5 Government Policy on OER

To establish a database of scientific data which would be open for the general public, especially for educators and researchers, the Ministry of Science and Technology of the People’s Republic of China has released an *Interim Measures on Science Data Submission for National Science and Technology Programmes* to provide standards and administrative guidelines for public scientific resources. The Measures include definitions and scope of such data, the methods for compiling and submitting materials, the procedures for submissions, examinations and publications, and the administration, incentives and punishments for individuals involved.

In order to start a national project using existing network and to establish a new network to share cultural resources, the Ministry of Culture and the Ministry of Finance released the *Announcement of Establishment of National Cultural Information Resources Sharing Project*, providing administrative guidelines and rules of financial aids. The Ministry of Culture also announced an *Interim Measures on the Administration of National Cultural Information Resources Sharing Project* for practical measures of the project.

In order to assure the quality of educational websites and the quality of content provided by the websites, the Ministry of Education approved *Interim Measures on Educational Website and Online Schools*. The Measures define educational websites as “websites that host information repository by collecting, integrating and posting educational resources, establish online platform and searching tools for the access of such information, and are connected to the Internet through an Internet Service Provider and provide such information to its users”. The educational websites should apply to educational administrative authorities for registration and approval.

The Ministry of Education stipulates in *Implementing measures on the Chinese Quality Courses Project* that “the Ministry of Education shall fund CQC Project. The funds shall cover construction and maintenance”. The amount of such financial aid depends on the “quantity, updates and maintenance of online CQC materials”. The General Office of the Ministry of Education released a *Circular on Supplementary Provisions of Measures of Implementation the Chinese Quality Course Project* which explicitly indicated

that “the fund for CQC construction (including the construction fee and maintenance fee for a five-year term) shall be earmarked in one batch 3 months after the evaluation results are announced”, and the amount is to be adjusted on the basis of the “evaluation results provided by experts”.

The Ministry of Education further provided in the *Announcement on Implementation of the Chinese Quality Courses Project(2010)* that “all universities shall award teachers who have contributed their courses to Chinese Quality Course project... certain financial aid shall be applied to those who have contributed courses that are recognized as Quality Courses... The achievements in CQC construction shall be considered as a factor in the evaluation of higher education excellent teacher awards.”

Apart from these funds directly allocated by the government, the universities also provide economical incentives for teachers who contribute their works to the Chinese Quality Course Project. These approaches include the following steps:

- 1) to consider the finished courses as regular educational assignment and increase the salary based on such achievements;
- 2) to give an extra bonus based on such achievements;
- 3) to provide directly a construction fee for the courses contributed;
- 4) to assign priority to OER contributors in university professional post evaluations.

I.6 Evolution of OER in China

The understanding and awareness about OER has been gradually developing in the course of the progressing of OER over the world. When MIT originally launched its open courseware project in 2001, it put forward the concept of “open courseware” (OCW) rather than “open educational resources”. The content of “Open Courseware” referred to teaching notes, experiment reports, homework assignments, bibliography, laboratory manuals, tests, etc. Internet users from any country can access those resources for free.

In addition, some international agencies have also recognized an importance in OER. The Centre for Educational Research & Innovation (CERI) of the Organization for Economic Cooperation and Development (OECD) launched a project “The Opportunities and Challenges of OER” in August 2005. In the frames of the project, researchers defined OER as digital resources which can be freely and openly provided for teachers, students and self-learners to support their teaching, learning and research. The researchers from CERI further pointed out that OER should also include technical resources, such as

I. General Background

software tools for the development, dissemination and usage of open resources. Compared to the Hewlett definition, CERI included “open source software” in the definition of OER. So correspondingly, OER mainly covers open source software (such as course management systems), open courseware and related materials, open resources for teachers to improve their e-teaching capacity, a courseware library, and free educational courses.

Open source software promotes the technology of production, dissemination and application for OER, and also effectively reduces the sharing cost. More importantly, OER and Open Source Software (OSS) have the same mission for open sharing. They both consider knowledge as a social product obtained as a result of cooperation, so it should belong to all members of human society and people should have the right to access all the accumulated knowledge equally, unconventionally and freely.

The most important events in the process of development of OER collected by a number of researchers are presented below in Table 1.6 (Wang Long, 2009).

Table I.6. Milestones in OER

Year	Milestone
2001	<ul style="list-style-type: none">• MIT started the Open Courseware Project.
2002	<ul style="list-style-type: none">• UNESCO organized a special forum on Open Courseware, which formulated the definition of OER.• The International University Union launched cooperation projects with MIT OCW. They translated those English course resources into Spanish and Portuguese.
2003	<ul style="list-style-type: none">• MIT Open Courseware Project released 500 courses.• The project “Chinese Quality Course” was implemented in China.• MIT translated the English courses into Chinese in cooperation with the CORE and the Open Source projects in Taiwan.
2004	<ul style="list-style-type: none">• Open learning support system comprehensively introduced by MIT OCW.• MIT OCW published the first OCW report.
2005	<ul style="list-style-type: none">• OCW Consortium was founded: portals to develop and organize the dissemination and research work released.• The First International Conference on Open Education was held at the University of Utah.• UNESCO held the second forum on Open Educational Resources.• UNESCO and OECD research groups released special reports.• MIT OCW published the second OCW report.

Open Educational Resources in the People's Republic of China

Year	Milestone
2006	<ul style="list-style-type: none"> • “Creative Commons” was recognized and used widely in the release of OER. • The Open University UK implemented the OCW project within “OpenLearn” project (launched in October 2006). It was the first distance education institution to implement an OER project. • ICDE launched its Global Task Force on Open Educational Resources (OER) at the UNESCO HQ in Paris with strong support from UNESCO. • Novell Company launched the OCW project that was the first open sharing project held by an IT Company.
2007	<ul style="list-style-type: none"> • MIT OCW released 1800 course resources one year ahead of schedule. It launched the project “Highlight School” for high school students. • More than 1,800 Chinese quality courses were published. The “National-Provincial-school” three-level system of quality courses was developed. Another series of Chinese quality courses were developed to publish 3000 Chinese quality courses in the future. • ICDE held the meeting for agency directors.
2008	<ul style="list-style-type: none"> • The number of members of the Utah OpenCourseware Alliance sharing curriculum resources increased rapidly. • The Fourth International Conference on Open Education in Dalian. • The International Conference on Open Education of the Utah State University. • The number of Chinese quality courses reached 2500 and established 669 new projects.

Chinese scholars also invested efforts into interpreting and defining the concept of OER. According to Zhu Zhiting and Yu Ping (*The research on OER typical projects*) further explanation of the concept of OER and connotations of OER should be analyzed in three aspects: “Open”, “Education” and “Resources”.

1. The connotation of “Open”: resources are free to access, use and reuse without (or as little as possible) being fettered by society, economy or law. Using resources, people also make their own contribution to construct resources in such a way that their integral value increases.
2. The connotation of “Education” has three main aspects. (1) The content of resources is closely related to education; it includes courseware, learning objects, teaching tools, etc.; (2) Resource users are teachers, students and self-learners who are closely related to education; (3) Resource is used for education and educational practice.
3. The connotation of “Resource”: OER includes not only courses, course components, open access journals, reference books and other material resources but also learning/content management software, content development tools, standards and licensing protocol of publishing digital resources, etc. OER includes the following two components: (1) digital content which is available to learners for free and (2) software tools which are used to create, publish, use and improve open learning contents.

I. General Background

Open Courses are digital educational resources freely opened to the society; they are a sum of teaching contents and activities in one subject in compliance with Creative Commons licenses. They include, at least, a course outline, a course calendar, lecture notes or other similar contents, which compose integral course resources of a whole class. They also include some extended resources such as exercises, videos, exam papers, study guides, learning samples or learning tools, reference materials and other types of resources.

OER are further categorized into two levels: generalized OER are a sum of resources freely opened to society for educational application on condition that they are in compliance with a Creative Commons license. Narrow interpretation of OER defines them as educational resources, which can be referenced, adapted and applied by proper user for non-commercial purposes, and mainly provided with the support of information and communication technologies (ICTs). OER include learning resources, resources supporting teachers' activity and resources ensuring quality of knowledge. The open course is one form of OER.

Some researchers (such as Wang Fengdan, Chen Cun, and Wangzeng) illustrate the relationship of open content and open courseware and OER by a diagram (see Fig. 1.6). They declared that the open content means any creative work which explicitly allowed copying its content. The "Open Courseware" refers to those educational materials which are open and free. It is organized in the form of curricula (Chen Cun, Wangzeng, 2008).

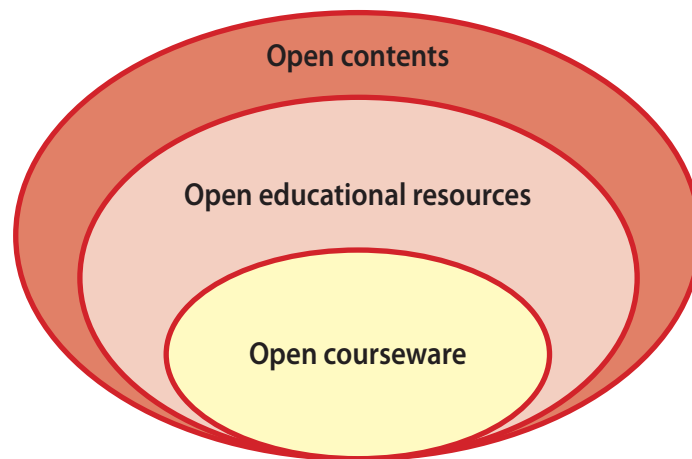


Fig. 1.6. Relationship of Open Content, Open Courseware and OER

The realization and comprehension of OER in the Chinese education can be summarized as follows: the purpose of "openness" is to provide full use of ICTs to broaden the frame of educational resources. It is helpful to break down the limitations of traditional educational forms. In addition, OER are mainly provided to learners, including school pupils and students as well as adults. The major forms of OER are digital electronic resources, such as texts, pictures, voices and videos, etc. "Free access" to OER, implies free access, modification and distribution of resources in compliance with some standards (such as Creative Commons), which differ radically from the traditional "All Rights Reserved" mode.

I.7 Academic Research in OER

In 2001, the Massachusetts Institute of Technology (MIT) started the “open courseware” (OCW) project that initiated the global movement for “open educational resources”. In 2002, UNESCO (United Nations Educational, Scientific and Cultural Organization) organized a forum “Open Courseware for Higher Education in Developing Countries” in Paris. A clear definition of OER based on MIT’s practice was presented at the meeting. Most participants agreed that OER meant the educational resources which could be obtained for free, referenced and applied without obstacles for non-commercial purposes. They usually serve both teaching and learning, are mainly provided with the support of information and communication technologies (ICTs) and can be freely obtained from the Internet. Typical resources include teacher’s notes, references, reading materials, exercises, experiments and demonstrations as well as syllabus, course content and teacher’s manuals.

Inspired by the ideas of “openness and sharing” and “free communication of knowledge”, Chinese educators actively joined the global OER movement. A number of initiatives was launched to promote OER communication in China. The project “Chinese Quality Course” was implemented. CORE (China Open Resources for Education) was founded to advance the set up and development of educational resources sharing system. More and more scholars were engaged in the research on OER, and the number of published research papers was increasing.

A query for the keywords “Open Educational Resources” run to search the China National Knowledge Infrastructure (www.cnki.net) yielded 118 papers (see Fig. 1.7.1). As much as 114 papers on “Open Educational Resources” were published in 2003-2009. The number of research papers about “Open Educational Resources” is distributed as shown in Fig. 1.7.2.

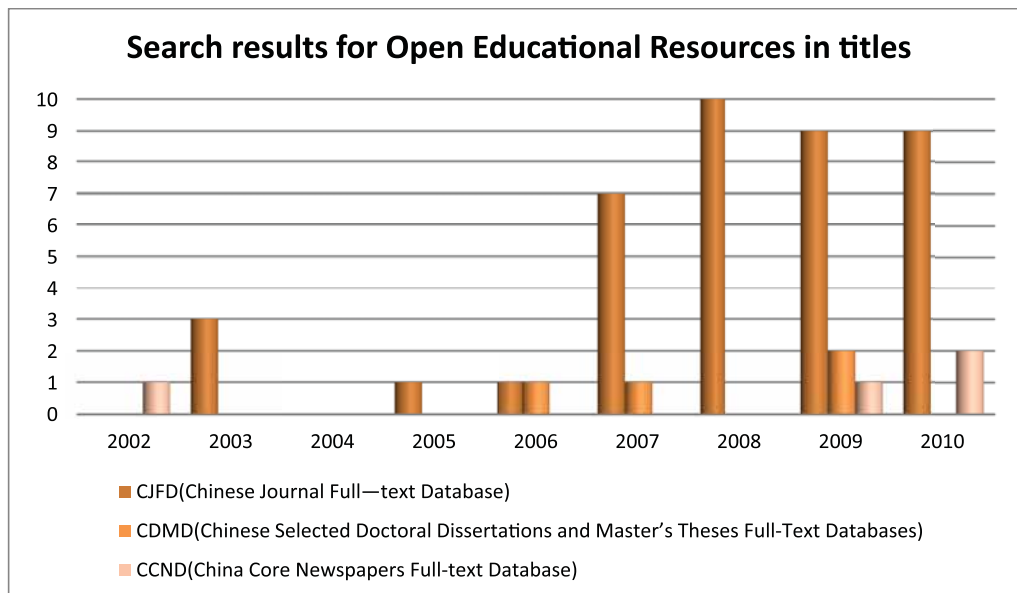


Fig. 1.7.1. Search results for the keywords “Open Educational Resources”.

I. General Background

In 2003, the Ministry of Education of China decided to implement the project “Chinese Quality Course” as a part of “The Action Plan for Invigorating Education in 2003-2007”, researchers published seven papers that year. But the OER movement started in China a little later, so it had not yet formed complete mechanisms and systems by 2007. Therefore, only few scholars were concerned about OER. The increase in the number of papers from 2007 to 2009 was due to the fact that the first group of Chinese Quality Courses had been finished, and more than 1,800 Chinese quality courses had been published and shared among college teachers and students by the end of 2007; thus shaping the “National-Provincial-School” three-level system of quality courses established before. At the same time, the next series of Chinese Quality Courses was designed.

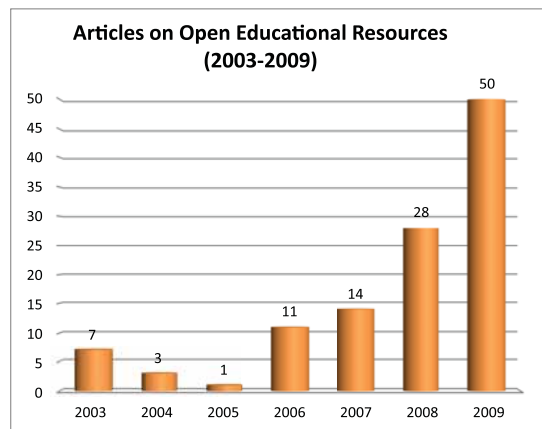


Fig. 1.7.2. Distribution of articles about “Open Educational Resources,” 2003-2009.

In addition, CORE Association promoted the development of OER. The Third International Conference on Open Education held in Xi’an in 2006 and the Fourth International Conference on Open Education held in Dalian in 2008 also promoted the development and the spread of OER in higher education in China. The hot topics for research on OER included a current advancement of OER, the Chinese Quality Course, the operating mode and practical issues related to OER, technical support to OER, the copyright issues, etc.

I.8 Adaptations of OER in China

The literature review evidences that recent Chinese research of OER is mainly focused on understanding of the concept of OER, the construction and the operating mode of OER, as well as the OER sharing mechanism. Governments, research institutions, universities, companies, social organizations, individuals are producers and providers of OER: political documents, academic reports, economic information (such as advertisement, business situation, etc.), historical documents, literature and art, life and entertainment. OER can appear in the form of texts, documents, image files and software.

The forms of open resources in China include open virtual learning communities, open courseware, open digital libraries, open journals, etc. These resources are mainly supported by information platforms, such as social networking sites, open course sites, dissertation database, Wikipedia, etc.

The paper *The Developmental Mode and Trends of Colleges’ OER* published by Dr. Zhao Guodong and Jiang Zhongjiao (2009) introduced a variety of existing operating modes of OER. The construction and implementation mode of OER introduced consists of five components: open standards and protocols, open source tools and software, open source course management system, open access content and open share community (See Fig. 1.8.2).

Open Educational Resources in the People's Republic of China

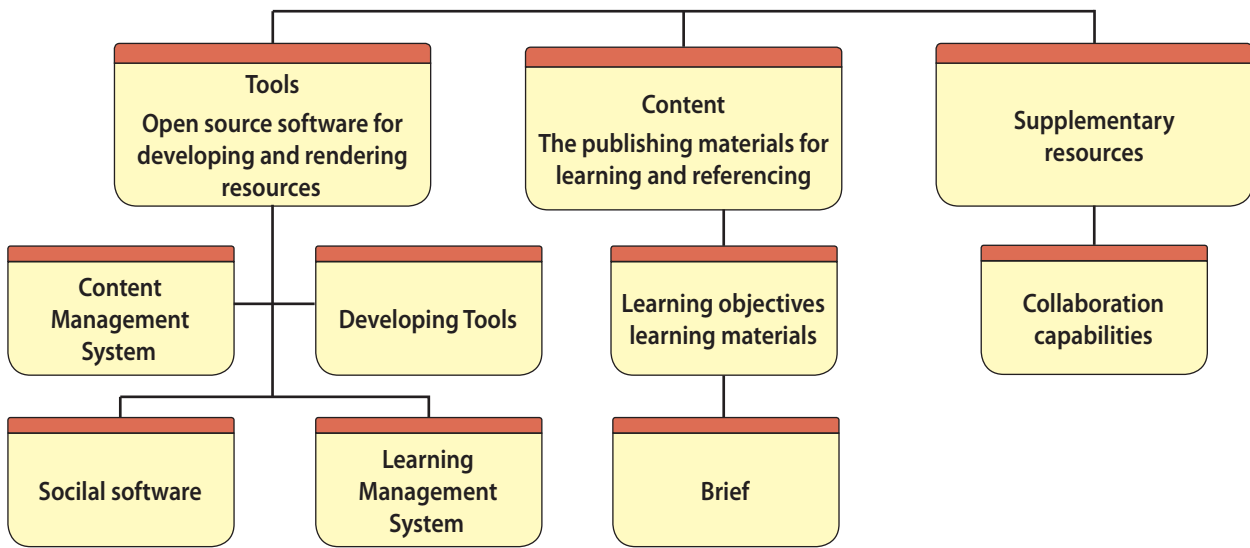


Fig. 1.8.1. Open resources in China.
Source: Weng Zhuhua (2007).

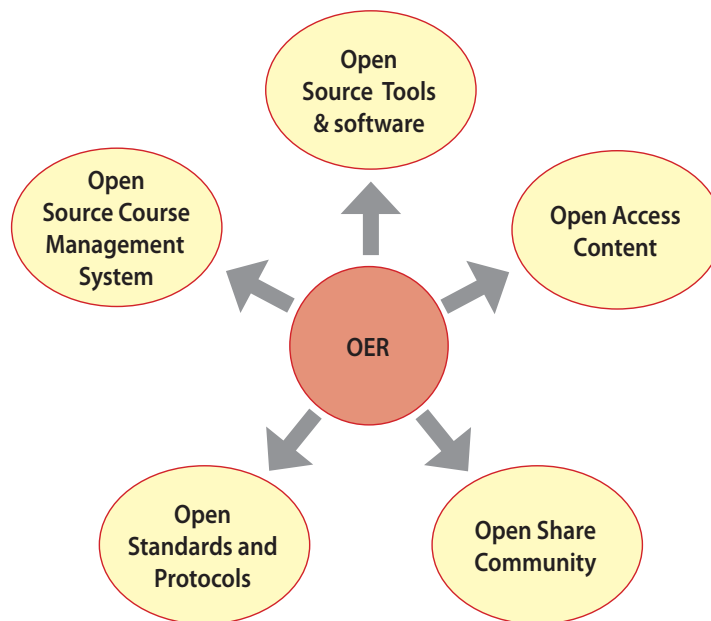


Fig. 1.8.2. Construction and content of OER.
Source: Zhao Guodong (2009)

The author constructed an open and pluralistic mode of instructional resources for higher education agencies based on five dimensions and supported by Internet and digital technologies. In this mode, all educational resources of one school are concentrated in an open course management platform,

with the base of “open standards and protocols” and “open source tools and software”.

Using the platform and the “open sharing alliance” as organizational mechanisms and Internet’s interactive features in dissemination of resources, a university can share its internal open accessed contents with other universities through the Internet. Meanwhile, following a similar scheme, other higher education institutions also can exchange and share teaching resources with this university. Thus, it eventually forms an international and global structure and sharing network of teaching resources for higher education based on OER.

The paper published by Huang Chuanhui (2010) summarizes five models, three mechanisms and multiple formats in distance education resource sharing (See Fig. 1.8.4). The five educational resource integration and sharing models are designed for:

- the China Central Radio and TV University and other national universities;
- the China Central Radio and TV University and the national educational industries (ministries);
- the China Central Radio and TV University and provincial Radio and TV Universities;
- provincial Radio and TV Universities and local governments, colleges, universities and enterprises;
- the China Central Radio and TV University and foreign distance education institutions.

The three mechanisms include protocol constraint mechanism, system action mechanism and project promotion mechanism. Multiple formats consist of course cooperation (sharing of courses, etc.), professional cooperation (sharing of expertise, etc.), degree cooperation, projects cooperation, certificates cooperation, personnel cooperation (teachers, experts, etc.).

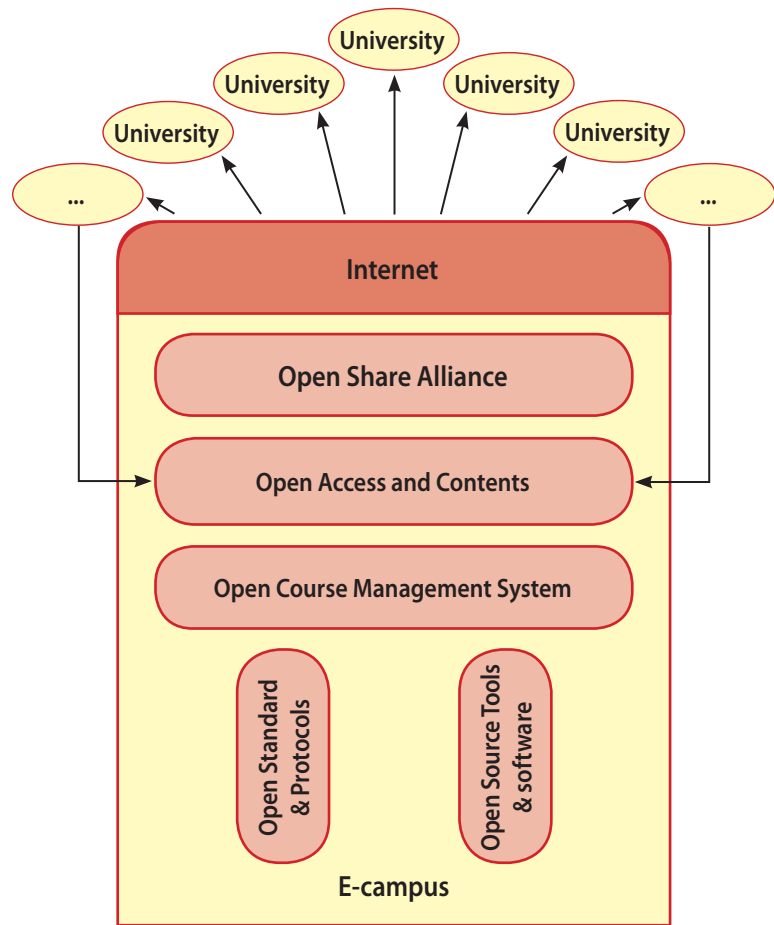


Fig. 1.8.3. OER Construction and Sharing Mode based on the Internet.
Source: Zhao Guodong (2009)

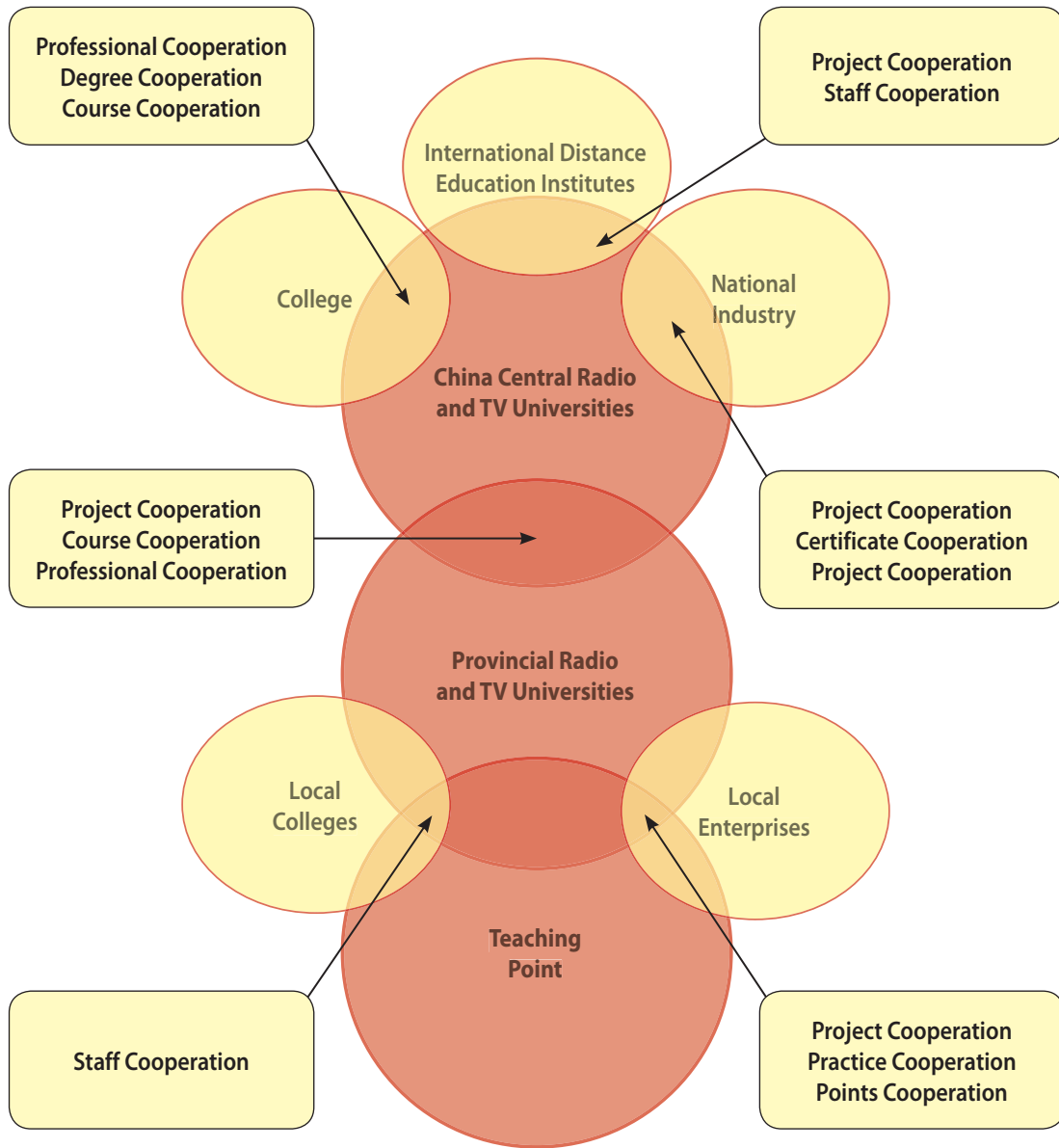
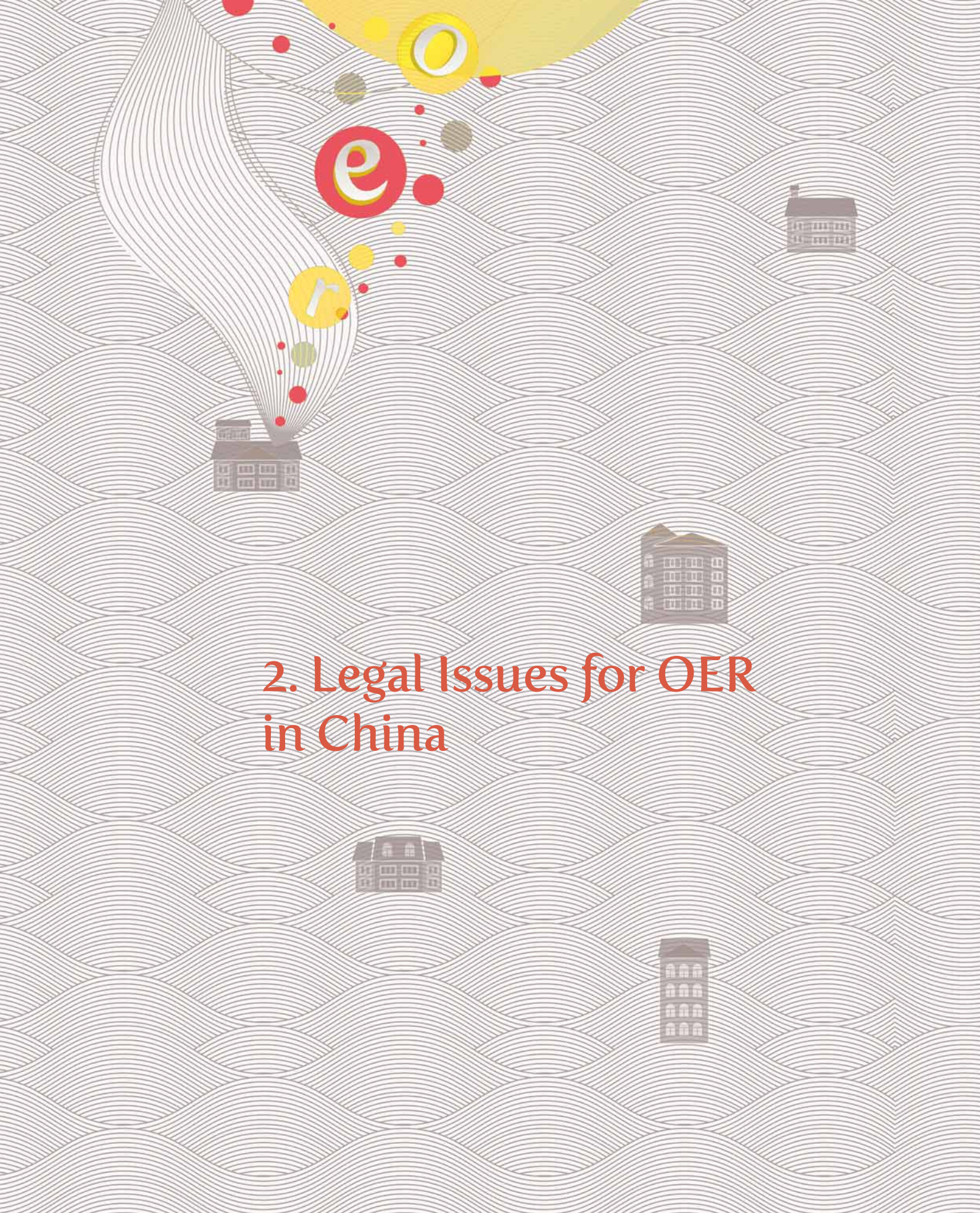


Fig. 1.8.4. OER integration and sharing model.
Source: Huang Chuanhui (2010)



2. Legal Issues for OER in China

2.1 The Balance of Legal Rights in a Knowledge Sharing Community

Copyright for educational resources has been a critical issue since MIT set up the OCW project. In case of OER, “open” does not mean completely giving up the copyright and it does not mean access to the resources free of charge. OER providers and users are concerned about copyright issues; they would like to know how to refer to the works of others and to what extent the works of others can be modified. *The Special Survey about Online Resources Operation of Beijing Quality Course* proves that 39.4% of the Quality Course teachers (T0) and 40.6% of ordinary teachers (T1) are satisfied with the copyright protection mechanism of the current online resources of the Beijing quality course, 16.3% of the T0 and 8.4% of the T1 are dissatisfied, while 41.8% of the T0 and 49.1% of the T1 keep neutral position.

China adopts the principle of automatic copyright protection, i.e. copyright is granted automatically upon creation of the work. In general, the duration of copyright is life of the creator plus 50 years. China joined all the major international treaties on intellectual property rights including TRIPs, WCT and WPPT.

Chinese laws related to copyright include *Copyright Law of the People's Republic of China*, *the Ordinance on the Protection of the Right to Network Dissemination of Information* and *the Regulation on Protection of Computer Software*. Under these laws and regulations, the default implementing mode of copyright is “all rights reserved” which considerably impedes sharing and utilization of resources. The Creative Commons licenses formulated by Creative Commons are recognized and used widely around the world. China Mainland has introduced the CC 2.5 version. With the help of CC licenses, creators can retain their own copyright and authorize others to freely use resources for a particular purpose in specific circumstances. The CC licensing is a Web 2.0 tool. It simplifies the creation of modular contents.

In July 2006, *the Regulation on Protection of the Right to Network Dissemination of Information* came into effect, which provides an exception for usage of educational resources. The Regulation states that some short written works, music works, paintings and photography courseware, which have been published, could be used without the authors' prior permission for the use in the nine-year compulsory education and some national education programmes through information network. They may be provided to the enrolled students by the distance education institutions which had produced or legally obtained the works. But the institutions shall pay the authors. However, these laws do not define clearly the scope (quantitative parameters) of the fair use.

If the resources are only used for personal study and research purposes, the use of the content in the field of education can be considered as “fair use”. Copyright should be considered if the relevant resources are referred to or modified.

As to the balance between ensuring creative incentives and providing open access for transfer of knowledge, the key issue is how to design copyright laws and sharing protocols consistent with the actual situation of Chinese OER's development.

2.2 Legal Issues Related to OER in China

There is a well-established legal system for education and incentives for educational endeavours in the People's Republic of China. Legal documents related to regulation of Open Educational Resources include:

- 1) The Constitution;
- 2) Education laws, including *Education Law of the People's Republic of China*, *Vocational Education Law of the People's Republic of China*, *Compulsory Education Law of the People's Republic of China*, and *Higher Education Law of the People's Republic of China*, etc.;
- 3) Copyright law and relevant regulations including *The Copyright Law of the People's Republic of China*, *the Ordinance on the Protection of the Right to Network Dissemination of Information*, *the Regulation on Protection of Computer Software*.

2.2.I The Constitution of the PRC

The Constitution of the People's Republic of China provides detailed references to supporting educational endeavours conducted by individuals and institutions.

For the educational infrastructure, Article 19 stipulates that the state shall develop education and work to raise the scientific and cultural level of the nation. It shall also develop educational facilities in order to eliminate illiteracy and provide scientific, technical and professional education as well as general education for workers, farmers, state functionaries, etc. Further, it shall encourage the collective economic organizations, state enterprises and institutions and other sectors of the society to establish various types of educational institutions in accordance with the law.

Article 47 states that "citizens of the People's Republic of China are free to engage in scientific research, literary and artistic works and other cultural pursuits". Also, the government "encourages and assists creative endeavours conducive to the interests of the people that are made by citizens engaged in education, science, technology, literature, art and other cultural work", which clearly indicates that the government shall play its role in education initiatives.

2.2.2 Education Laws

According to Article 13 of *the Education Law of the People's Republic of China*, the government shall encourage units or individuals that have made outstanding achievements in the development of education. Article 46 requires the state to encourage enterprises, institutions, public organizations and other social organizations to cooperate in various forms with institutions of higher education and secondary vocational schools in teaching, scientific research, technology development and popularization. Article 52 further stipulates that the state shall encourage public organizations, social and cultural institutions, other social organizations and individuals to run social, cultural and educational activities.

In general, The Education Laws supports OER concept and provides the government's role in building OER repositories for education. However, considering the background of sharing and life-long education, the current education laws still lack clear rules related to digital and online educational materials.

2.3 Copyright Issues

2.3.1 Copyright Law of the PRC

A significant legal support for OER producers is the provisions of the Copyright Law on fair use. Educational resources, unlike other resources, are more likely to be created on the basis of existing materials elaborated by others. Creators of OER can avoid copyright infringement through the fair use exception.

Fair use refers to using copyrighted materials with no need to receive permission or pay the copyright holder under certain circumstances. Article 22 of the Copyright Law provides regulations on fair use: a work may be used without permission and remuneration to the copyright holder, provided that the copyright owner is identified and other rights of the copyright owner must not be interfered. However, for the use of such materials in the educational context, Clause 6 of Article 22 only allows users to translate or reproduce the source "in a small quantity of copies, of a published work for use by teachers or scientific researchers, in classroom teaching or scientific research, provided that the translation or reproduction shall not be published or distributed".

Unfortunately, this provision is basically applicable only to physical classroom setting. Also, it allows only translation and reproduction "in a small quantity", and does not allow publication and distribution of such copies to the public. Apparently, the beneficiary of this clause does not include OER producers who are most likely to post their materials online.

However, Article 23 of the Copyright Law provides that in compiling and publishing textbooks to be used for the nine-year compulsory education and the national educational programme, parts of published works, short-written works, pieces of music or single copies of paintings or photographic works may be compiled into textbooks without permission from the authors, unless the authors had explicitly banned this, with remuneration paid according to the regulations, the name of the author and the title of the work indicated without prejudice to other rights enjoyed by the copyright owners according to this Law. Yet, the term "textbooks" is used without clarification on whether it includes online textbooks accessible as OER or not. However, the Fair Use Exception for the purpose of education is unlikely to be extended to OER resources.

There is a very important provision regarding the Fair Use Exception. Clause 11 of Article 22 allows "translation of a published work from the language of the Han nationality into minority nationality languages for publication and distribution in the country". China is a multinational country inhabited by

56 nationalities. For any Mandarin language materials, translation into any language of an ethnic group can be considered as an act of fair use. This means that an OER project is free to provide translated materials in any language other than Mandarin Chinese and post them online for the educational use of ethnic groups free of charge.

Chapter III of the Copyright Law is about licensing. Article 24 provides that a licensing contract shall include the following basic clauses:

- (1) the way of exploitation of the work covered by the license;
- (2) the exclusive or nonexclusive nature of the right to exploit the work covered by the license;
- (3) the scope and term of the license;
- (4) the amount of remuneration and the method of its payment;
- (5) the liability for breach of contract; and
- (6) any other matter which the contracting parties consider necessary.

Article 25 further states that any other party to the contract shall not exercise the right which the copyright holder has not explicitly permitted in the contract.

According to these provisions, it is important to note that, having been ported, the Chinese version of the Creative Commons licenses is completely in line with the copyright law of China. Producers of OER may adopt CC licenses to provide their resources to the public, and their rights will be fully protected by the law.

Adopted at the 135th executive meeting of the State Council on May 10, 2006, the *Ordinance on the Protection of the Right to Network Dissemination of Information* (hereinafter “the Ordinance”) is the most important government regulation on the copyright of online resources. The Ordinance provides exception for use of materials in underdeveloped regions and areas of poverty of the country.

Article 9 of the Ordinance states that in order to alleviate poverty, any work on the subjects of planting and breeding, disease prevention and cure, disaster prevention and relief published by Chinese citizens, legal entities or other organizations may be provided through information network to the general public in the rural areas free of charge, provided that specific network service provider posts relevant information related to the work, the creator and royalty criterion in advance online and relevant author does not object uploading and disseminating his/her work. This means that as long as a website provides educational information for educational purposes to remote and poor regions, it can use copyrighted materials without requesting permission from the copyright holder. This could considerably decrease the transaction cost for OER producers, most of which have neither interests nor experiences to negotiate. After the required information is set online, even if the negotiation afterwards

2. Legal Issues for OER in China

fail to achieve an agreement, it is a matter of payment rather than infringement. This suggests a great prospect of OER in remote rural areas of China.

There is a provision on fair use under the Ordinance. Article 6 stipulates that under certain circumstances, “works may be provided through the information network, and the provider may be exempt from liability to obtain owner’s permission and to pay the relevant remunerations thereto”. It is obvious that usage of the copyrighted works for educational purpose is one of the circumstances, i.e. “in order to support the teaching or scientific research, published works are provided in small amounts to those engaged in teaching or scientific research”. According to this provision, OER producers are allowed to provide certain amount of copyrighted material to the users, and the key issue is to make sure these materials are in “small amounts”. However, this regulation basically allows OER producers to use existing copyrighted materials in most of the cases. It reduces the possibility that an OER video course will have to censor certain content of a lecture to avoid copyright disputes.

Article 4 states that no organization or individual may purposely circumvent the technical measures, purposely manufacture, import or provide the general public with any device or component that is mainly applied to circumventing the technical measures, or purposely provide such technical services to any other person for the sake of circumventing the technical measures, unless it is otherwise provided for by any law or regulation. However, Article 12 stipulates that for “a published work, performance or audio-visual product that is provided to a small number of people engaged in teaching or scientific research through the information network for the purpose of teaching or scientific research, whereby the aforesaid published products can only be accessed through the information network”, the relevant technical measures may be circumvented. Since many existing copyrighted educational materials are provided in PDF format and are protected by DRM, this provision is very helpful for OER producers.

Clauses 7 and 8 of Article 6 state that the use of materials is fair “where any article on current affairs such as political and economic issues that has been published is provided through the information network; or where a speech as delivered in a public gathering is provided to the general public”. Under such circumstances, works may be made accessible through the information network, and a provider may be exempt from liability to obtain owner’s permission and pay appropriate remunerations thereto. Therefore, OER producers can establish a digital resources repository based on existing news and publications on current affairs, and it would be helpful for such subjects as political economy and the like.

2.3.2 The Creative Commons Solution

Chinese law protects private CC arrangements in support of OER. The introduction and use of the Creative Commons licenses (the unported CC licenses) in China Mainland began in 2003. Soon after that, the use of the Creative Commons license for OER came into practice. In August 2003, Ji Yanjiang, founder of the Chinese open scientific literature depository (qiji.cn), adopted the unported CC license for the content available at qiji.cn website and rendered a Chinese version of the Common Deed of the CC license on that website.



Fig. 2.3.2.1. Homepage of Creative Commons China Mainland (<http://cn.creativecommons.org>).

In September 2004, upon the invitation of the International Commons (iCommons - now known as Creative Commons International (CCi)), Professor Chunyan Wang attended the first MIT and CORE Open Course Ware International Conference in Shanghai to make a presentation on the Chinese Copyright System and Creative Commons licensing.

On March 29, 2006, the China Mainland version of the CC licenses was officially launched in Beijing and Creative Commons licenses are now in full compliance with the Chinese law. Creators of OER content may apply a CC license to their works.

As calculated by a routinely-operated statistical programme of the Creative Commons (<http://labs.creativecommons.org/metrics/csv-dumps>), resources released under the China Mainland version of the CC licenses have had a rapid growth since it was ported to China Mainland. CC licenses have a growing impact on scholars, artists, university teachers and students. One can expect that it will become the future standard for open educational resources. Section 4 below showcases specific OER projects based on CC licenses.

To clearly specify the copyright status of OER and provide more flexible options for creators and copyright holders, many scholars suggested to use CC licenses for the CQC project, NCIRS project

2. Legal Issues for OER in China

(the National Cultural Information Resources Sharing Project), etc. (Wang Aihua and Wang Qiong, 2010). They indicated that many CQC contributors worry about their intellectual property right for the published materials. This has a negative effect on opening of their creative works, as they fear to lose identity as originators once they completely open the content of their works to the general public. Therefore, the CQC project needs to use open license to clearly indicate the copyright for both authors and users.

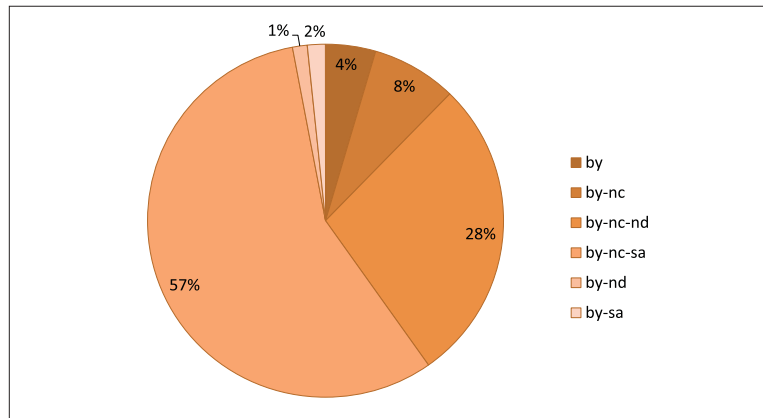


Fig. 2.3.2.2. Yahoo search results of works licensed by each of the CC licenses.

CC licenses are, without any doubt, the most flexible and standardized option for copyright solutions in this case. Also, there are many researchers suggesting to adopt CC licenses for institutional knowledge repositories (Hu Fang, Zhong Yongheng, 2007). They argue that usage of CC licenses may provide a solution for possible copyright disputes and the “some rights reserved” mode would be the most helpful model for an institution using its members’ and/or employees’ works.

The National Library of China, the major operator of NCIRS project, is also aware of CC’s advantages. In a forum entitled *Library Law and Intellectual Property*, a session of the Annual Chinese Libraries Conference 2010, Prof. Chunyan Wang introduced CC licenses to librarians from around the country and the librarians expressed great interest in CC licensing. The National Science Library of China (NSL), an

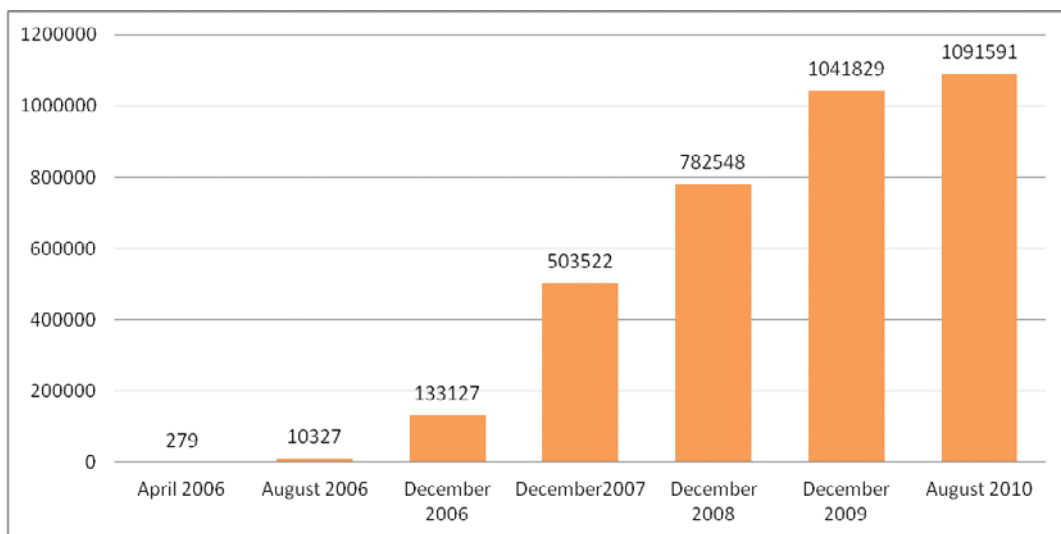


Fig. 2.3.2.3. Dynamics of CC-Licensed webpages in P.R. China (2006-2010)

important organizer of scientific literature and data sharing, has also cooperated with Creative Commons China Mainland to promote common use licensing for scientific literature and data. NSL, US National Committee for CODATA, National Academy of Sciences and Creative Commons China Mainland co-hosted an international symposium on Common Use Licensing for Scientific Literature and Data in Beijing on March 25th, 2009. More than 180 participants from libraries, universities, and relevant government sectors from around the country attended the conference. When NSL created its online Institutional Repository, it adopted CC licenses for most of the materials. Researchers from the China Academy of Science believe that CC provides practical and flexible licensing solutions and they hope it “may guide for ways to solve the copyright problem of the repository” (Hu Fang and Zhong Yongheng, 2007).



3. Technology Issues for OER in China

3.1 The ICT Infrastructure for OER in China

OER are defined as electronic resources based on the use of ICT, whose design, production, dissemination and sharing are supported by new technologies. From another perspective, however, ICT infrastructure directly affects the status of the application and development of OER. Especially in a developing country like China, the economic growth and the information technology infrastructure are not well balanced. The extent of application and development of OER differs in different areas of the country. Overall, the report finds that OER development and application in education are currently prevailing in schools, especially higher education institutions, in view of the current educational level.

On July 15, 2010, the China Internet Network Information Centre released *The 26th China Internet Development Statistics Report*¹. The survey data shows that during the first six months of 2010, the number of Internet users continued to grow, as of June 2010, the overall population of Internet users reached 420 million with an increase by 3,600 million since the end of 2009. Internet penetration rose to 31.8%, compared with 2.9 percentage points increase since late 2009.

As of June 2010, the number of China's IPv4 address reached 250 million, an increase of 7.7% in six months. As the Internet "house number", IPv4 address resources are approaching exhaustion and the Internet is imperative to the transition of IPv6 networks. The total number of Chinese domain names dropped to 11.21 million, of which CN domain names amounted to 7.25 million. CN domain names in the proportion of the total decreased from 80% to 64.7%. At the same time, the number of .COM domain names increased up to 535,000, and their share increased from 16.6% to 29.6%. The number of sites dropped to 2.79 million, and .CN is 2.05 million, accounting for 73.7% of the overall site. International bandwidth is up to 998,217 Mbps, which has got a growth of 15.2% in six months.



Fig. 3.1.1. Internet Penetration (2005–2010).

¹ Unless stated otherwise, the source of data for all tables and charts in this section is *The 26th China Internet Development Statistics Report*.

Table 3.I.I. China Internet Content Creation between 2009.I2-2010.06

	December 2009	June 2010	Increase in six months	Growth Rate in six months
IPv4	232,446,464	250,452,480	18,006,016	7.7%
Domain Name	16,818,401	11,205,585	-5,612,816	-33.4%
Chinese Domain Name	13,459,133	7,246,686	-6,212,447	-46.2%
Website	3,231,838	2,787,480	-444,368	-13.7%
.cn Website	2,501,308	2,064,736	-446,573	-17.9%
International bandwidth (Mbps)	866,367.20	998,217.45	131,850	15.2%

As of June 2010, the number of Chinese Web sites, whose domain names were registered within the Chinese territory (including access within and outside the country) decreased to 2.79 million, a decline of 13.7%.

Survey data shows that the educational level of Internet users in China were in the low-end trend. As of June 2010, the shares of junior high and primary school users were 27.5% and 9.2% (of the overall Internet users), their growth rates were higher than those of other categories of users. The shares of tertiary and higher education users continued to reduce to 23.3%.



Fig. 3.1.2. Dynamics of Chinese websites (excluding EDU.CN)

3. Technology Issues for OER in China

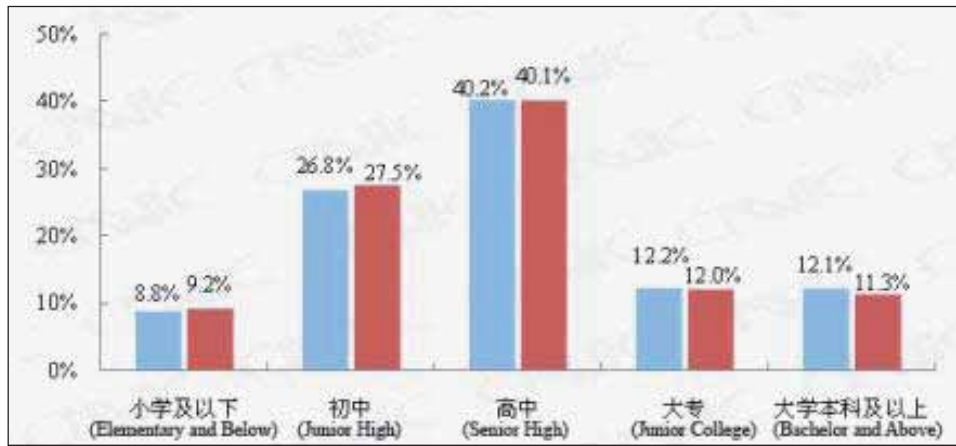


Fig. 3.1.3. Distribution of Internet usage among students between 2009.12 and 2010.06

Such occupational categories as high school students, self-employed/freelance, animal husbandry and fishery workers and other groups were rising faster while unemployed/laid off/unemployed, rural migrant workers, industrial workers and other professional services experienced a decline. The share of students among Internet users, in general, was still much higher than the shares of other groups - about 1/3.

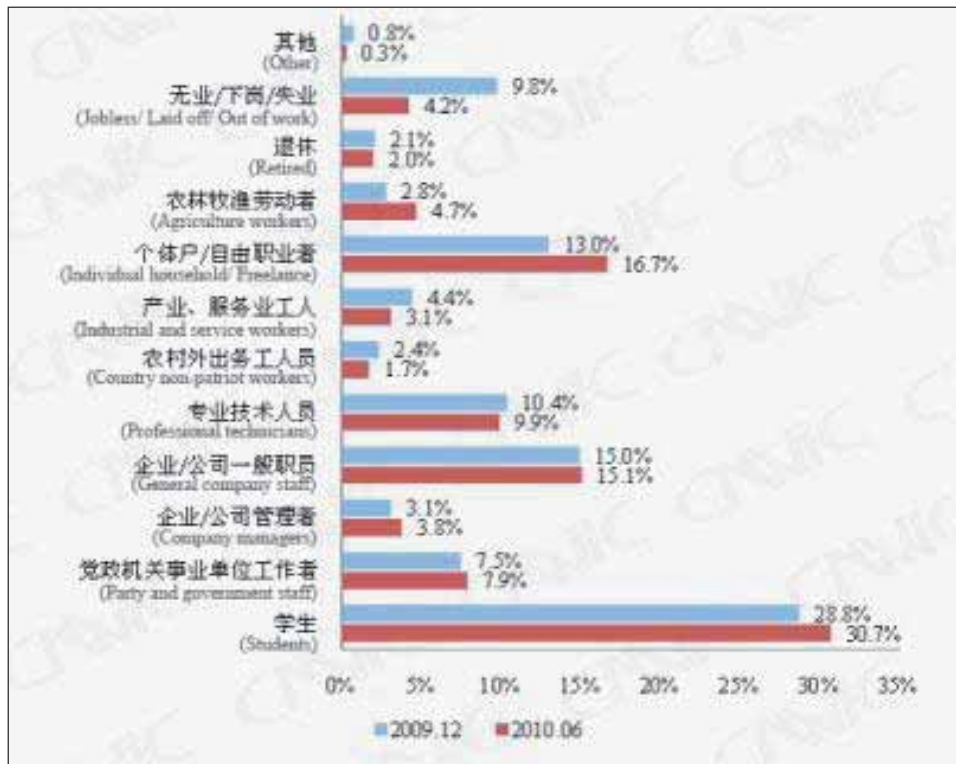


Fig. 3.1.4. Distribution of Internet users by occupation between 2009.12 and 2010.06

One can see that the usage for business expanded rapidly, the entertainment tendency maintained and communication and information tools became more widely spread. In the first half of 2010, the majority of network applications become more popular among Internet users: all kinds of network applications continue to grow. In particular, business applications got a great increase. Online payments and shopping, as well as Internet banking got a 30% growth in six months, far more than other types of network applications. The number of social networking sites, network literature and search engine users increased as well.

Table 3.I.2. Network behaviour between 2009.I2 and 2010.6

Type	Application	2009.12 utilization rate	2010.06 utilization rate	2009.12 ranking	2010.06 ranking	Trend
Web entertainment	Online music	83.5%	82.5%	1	1	→
Information acquisition	Online news	80.1%	78.5%	2	2	→
Information acquisition	Search engine	73.3%	76.3%	3	3	→
Communication	Instant message	70.9%	72.4%	4	4	→
Web entertainment	Online game	68.9%	70.5%	5	5	→
Web entertainment	Online video	62.6%	63.2%	6	6	→
Communication	Email	56.8%	56.5%	8	7	↑
Communication	Blog	57.7%	55.1%	7	8	↓
Communication	SNS	45.8%	50.1%	9	9	→
Web entertainment	Online literature	42.3%	44.8%	10	10	→
Commercial transaction	Online shopping	28.1%	33.8%	12	11	↑
Communication	BBS	30.5%	31.5%	11	12	↓
Commercial transaction	Online payment	24.5%	30.5%	13	13	→
Commercial transaction	Online bank	24.5%	29.1%	14	14	→
Commercial transaction	Online stock market	14.8%	15.0%	15	15	→
Commercial transaction	Travel book	7.9%	8.6%	16	16	→

It is obvious that in recent years China's Internet progressed tremendously in terms of hardware infrastructure, or the total number of Internet users and networks. Among 420 million Internet users, the highest share is students, accounting for nearly one-third (30.7%). This testifies to the fact that there are good grounds for dissemination and application for OER in school education.

3.2 Chinese Government Policy for ICT in Education

China's educational information development can be divided into three stages: from mid-1980s to early 1990s – the early stage, mainly computer education, the use of single computer-aided tools and traditional educational tools for teaching; from early 1990s to 2000 – the initial stage of development, mainly hardware infrastructure and information technology education, construction of the China Education and Research Network (CERNET) and popularizing a wide range of information technology in primary and secondary school, promoting universal application of information technology; the period after 2000 is the stage of rapid development, during which the variety of Government's educational information programmes enabled fast introduction of ICT in education.

Table 3.2. Chinese Government plans and projects in ICT in education (1994 – 2010)

Year	Title of Plan or Project
1994	CERNET Launch (China Education Research Network) promoting network ICT
1996	Computer education plan for primary and secondary school (1996-2000)
1999	Modern distance education project
2000	New century network curriculum project, the spread of information technology education in primary and secondary education, primary and secondary school curriculum guide for information technology (trial), on the implementation of the primary and secondary school link project notice
2001	Western modern distance education project, Western universities campus computer network construction project
2002	Education information X five-year development plan (outline), Vision of the Ministry of Education on promoting informatization of teachers education, Vision on promoting informatization of teachers education
2003	National teachers education network alliance programme
2004	New Action Plan for Invigorating Education – CEBSat and ChinaGRID (2003-2007)
2006	National Development Strategy 2006-2020
2010	Long-Term National Education Reform and Development Plan (2010-2020)

Source: the Chinese Ministry of Education (<http://www.moe.edu.cn>)

New Century Network Curriculum Project is intended to produce 300 basic network courses in two years and set up a courseware library. These courses are for the pilot work in several institutions and universities, also for the professional inter-school exchange programmes within the network and the mutual recognition of credits. Poorer areas and higher education institutions in the west of the country can benefit from the courses and the wealth of advanced teaching methods and teaching resources.

The spread of information technology education in primary and secondary school, the primary and secondary school curriculum guide for information technology (trial): requires the spread of information technology education in primary and secondary schools (including secondary vocational and technical schools) in 5-10 years after 2001.

On the implementation of the Primary and Secondary School Link Project Notice: Ensuring 90% of the independent primary and secondary schools can use the Internet, teachers and students can share resources online and improve the primary education quality in 5-10 years, so that all the teachers can generally receive the education aimed at improving the quality and capacity.

Western Modern Distance Education Project: To level out imbalances of the provision of educational information. The Ministry of Education cooperated with Li Ka Shing Foundation and accepted eighty million Yuan from the Foundation. Five thousand sets of satellite receiving equipment for modern distance education were donated to the primary and secondary schools in remote mountain areas in provinces to the west of China. Meanwhile, the Ministry of Education also provided five thousand sets of distance education satellite receiving equipment sets to primary and secondary schools in twelve western provinces.

Western University campus computer network construction project: To address the problem of the lag of the development of information technology education in western China behind the level of campus network construction in the east, a total 900 million Yuan was invested in the construction of fibre optic backbone campus computer network, campus network centre, open network rooms, multimedia network classroom, the capital city metro and non-capital city of high-speed access engineering, network management and operation of systems, teaching, research, management systems and network security system.

Education Information X five-year development plan (outline): emphasis on “educational information, educational resources building is the core,” and “strengthening education and resources information system platform environment... integration of quality educational resources, sharing of resources and improving teaching quality.”

Vision of the Ministry of Education on promoting informatization of teachers education: pointing out that “encourage and support through a variety of ways and means to enhance the development of teacher education information resources. Actively integrate various information resources of teacher education, strengthen the regional combination of advantages to ensure sharing of various information resources.”

Vision on promoting informatization of teachers education: “In order to meet the requirements to the development of the information society, using information to promote the modernization of education, the development of teacher education and informatization of the teacher education is an urgent and important task.”

National Teachers Education Network Alliance Programme: the following steps shall be taken to strengthen teacher training systems: satellite television and computer Internet “tri-network” for communication between different geographical areas, full use of modern means of distance education to break space-time barrier, encouraging teachers to share high-quality educational resources, large-scale continuing education for teachers, especially in rural areas.

Action Plan for Invigorating Education (2003-2007): including the implementation of the “Modern Distance Education Programme” and “education system development.” The plan foresees construction of public educational information service system, hardware design, software sharing service platform for online education; speeding up CERNET and China Education satellite broadband transmission network (CEBSat) upgrading and expansion projects, participation in the next generation Internet and the Grid (ChinaGrid) projects; strengthening resource integration, regional networking and management for the sake of establishment of a national education information application support platform.

National Development Strategy (2006-2020) is aimed to “accelerate the pace of information technology education and scientific research” as a national development strategic priorities.

National Long-Term Educational Reform and Development Plan (2010-2020): Chapter 19 dealing with “accelerating the process of educational informatization” emphasizes the importance of the following measures: “Speed up infrastructure construction, include the education informatization into the national information-development strategy, construct the educational information network ahead. By 2020, all levels of digital education service systems shall be available in urban and rural basic schools, promoting the educational content, teaching methods and methods of modernization.”

National strategies developed during the past ten years in the field of education and the information technology projects formed a good basis for the promotion and application of OER in China.

3.3 ICT Infrastructure in Universities

As the birthplace of OER and major users of ICT, higher education institutions directly affect the development of OER. In October 2010, the Institute of Education at the Peking University issued the “2010 Report on the Chinese University Information System” that introduced the current status of the infrastructure, support services and teaching informatization in the Chinese higher education institutions.

In recent years, based on wide usage of information technology in all sectors of the society, the development of campus network construction progressed very fast. According to CERNET statistics,

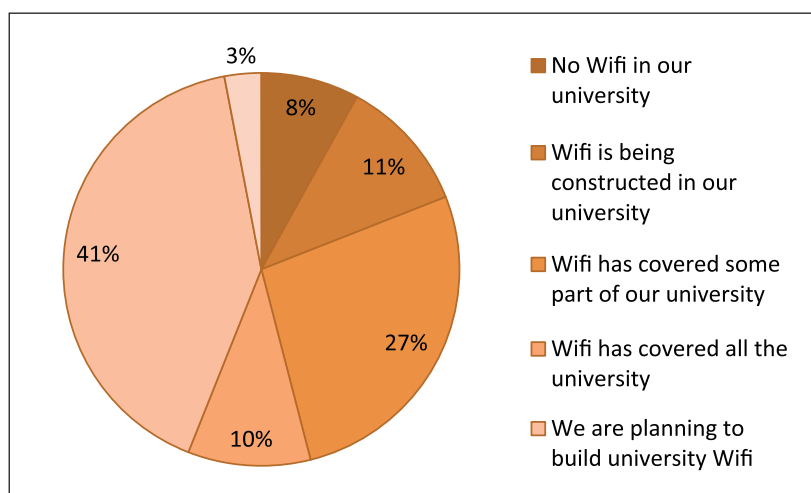


Fig. 3.3.1. Wireless Campus Networks
Source: Guodong Zhao and Yuan Shuai (2010).

the current total number of educational institutions having access to CERNET is above 3,000, of which the majority are tertiary institutions and education management departments. The 2005 survey of 257 schools revealed that 229 colleges and universities (89.1%) had school sites, 27 colleges and universities did not have a website. Meanwhile, the survey data also shows that more than a quarter (29.7%) of the surveyed colleges and universities had already begun to use the wireless campus network. Among them,

the share of schools that had a whole coverage of wireless network was 3.9%. In addition, 40.7% of the universities planned to build wireless campus network. The 2010 survey data shows that 37% of the universities completed the campus wireless network or some parts of it (see Fig. 3.3.1), the former indicator increased up to about 10%. Compared with 2005, the university wireless network demonstrated a more significant growth.

In colleges and universities, classrooms are the main place of teaching; a variety of information tools and equipment is being installed in classrooms; to a certain extent, it reflects the level of development of information infrastructure. The 2010 survey data presented in Table 3.3.1 shows that in colleges and universities the classroom computer installation rate, the Internet setting up rate and the projector

Table 3.3.I. Classroom technologies

Items	Network interface	Computer	Projector	TV	Inter-active white-board	Teaching feedback system	Automatic recording system
Frequency	179	179	179	179	179	179	179
Total	13545	11910	12175	4775	4855	4220	4975
SD	27.86	28.11	26.4	28.38	30.77	27.63	29.05
Average	75.6%	66.5%	68.0%	26.6%	27.1%	23.5%	27.7%

Source: Guodong Zhao and Yuan Shuai (2010).

3. Technology Issues for OER in China

installed rate were 66.5%, 75.7% and 68.0%, respectively. Compared to the 2005 survey data (16.9% for computers and 24.6% for projectors) the hardware device conditions in the classroom have been greatly improved. It is noteworthy, that in 2005, interactive whiteboards were installed in only 3.2% of colleges. By 2010, the share of classrooms equipped with interactive whiteboards increased to 27.1%. The survey also revealed that 23.6% of classrooms were equipped with teaching feedback system (Clicker) and 27.8% of the classrooms were equipped with automatic recording and broadcasting system.

Management system is a key to the application of information technology on campus; it provides a vital data and processes support for the management and decision-making for a school. Thus, for universities, which can support and integrate ERP information and develop the informatization throughout the campus, it plays an important role.

The 2010 survey data shows that universities are currently using the following information management systems: student management system (18.2%), financial management system (20.5%), personnel management system (15.1%), library management system (21.4%), course management system (19.1%), scientific research management system (3.4%) and online course selection system (4.7%).

Hardware and software are components of the digital campus environment, their main target is college students and the goal is to serve teaching, management and research. From this perspective, the core of the digital campus is its services and applications.

The 2010 survey data shows that among the colleges and universities covered by the study 18.3% of the universities had e-mail service for teachers, 12.5% had e-mail service for students, 6.9% provided video conferencing systems, 17.7% supplied students with dormitory network access services, 15.0% provided information technology training services for teachers, 14.1% had courseware design and production services for teachers, 15.2% had courseware website design and construction services for teachers.

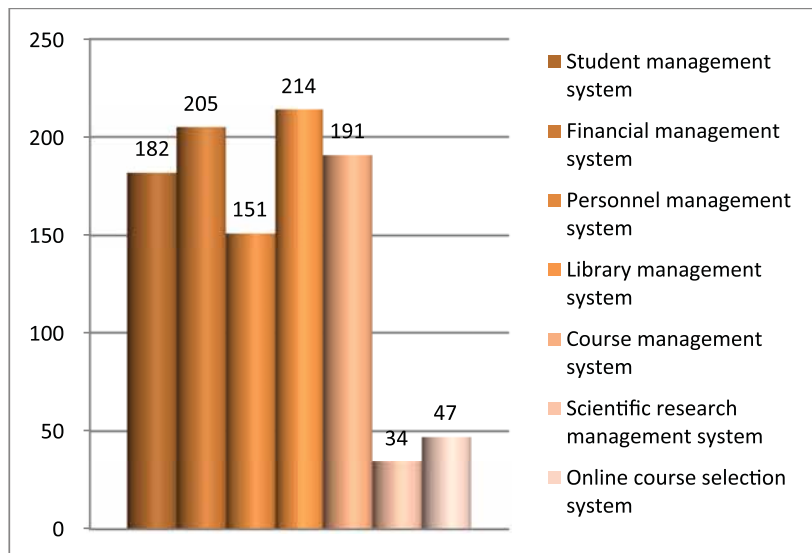


Fig. 3.3.2. Enterprise Resource Planning Tools Used in Chinese Universities and Colleges
Source: Guodong Zhao and Yuan Shuai (2010).

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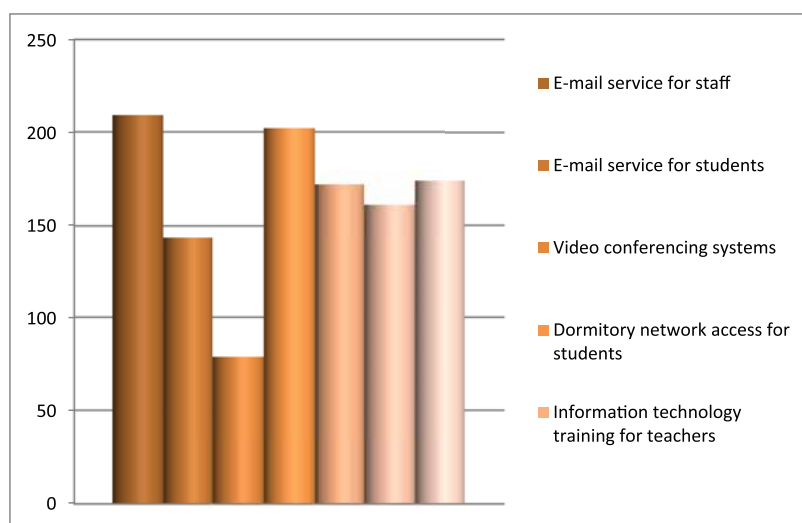


Fig. 3.3.3. Communication & Training Tools for Education

Source: Guodong Zhao and Yuan Shuai (2010).

This data evidence the information services and training in the universities need to be further improved, in particular the supportive policies that can promote teachers to use new technologies for the sake of reforming the education.

In addition to using a variety of information tools in teaching, a growing number of teachers use ICT for academic exchange and research dissemination. The survey data (see Table 3.3.2) shows that among the interviewed teachers nearly a half (46.4%) “always use the network to communicate with

domestic and foreign counterparts.” About 14% of those teachers “sometimes use the network video conferencing to communicate with foreign counterparts”. Furthermore, in the context of releasing and dissemination of research results, a quarter (25.3%) of respondents replied that teachers “often upload published papers, research reports to the Internet.”

Table 3.3.2. ICT tools used by faculty for teaching and research

Questions	Strongly disagree	Disagree	No Opinion	Agree	Strongly agree
I always use search engine to get instruction and research information	10	10	24	84 (15.0%)	431 (77.1%)
I always search instructional assistant information when preparing the class	8	9	25	93 (16.6%)	424 (75.8%)
I always use e-mail to communicate with students during teaching	20	46	77	175 (29.2%)	241 (43.1%)
I always upload materials to the Internet for students to download and review	50	63	89	152 (27.2%)	205 (34.2%)

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Questions	Strongly disagree	Disagree	No Opinion	Agree	Strongly agree
I always connect with colleagues in the country or abroad via online communication tools	94	86	119	139 (24.8%)	121 (21.6%)
I always upload publicized essays and research report online	135	141	141	83 (14.8%)	59 (10.5%)
Sometimes I communicate with colleagues in the country or abroad through online video meeting system	274	116	88	55 (9.83%)	26 (4.65%)
I have my course website which students could read at any time	147	80	77	89 (15.9%)	166 (29.6%)

Source: Guodong Zhao and Yuan Shuai (2010).

The data indicates that in 2010 60.5% of the universities used an online teaching platform, 31.6% of the universities considered the construction of a network teaching platform (see Table 3.3.3). In a short period of five years, the proportion of the use of a network teaching platform in colleges almost doubled (data for 2005: 33.3%); this proves that the university emphasis on teaching informatization keeps increasing.

Table 3.3.3. Technology specifically in support of OER

Questions	Number	Share (%)
There is no online course platform in our university	11	4.30
My university is using online course platform now	155	60.55
My university is considering constructing online course platform	81	31.64
No reply	9	3.51

Source: Guodong Zhao and Yuan Shuai (2010).

Along with the Open Educational Resources movement, the open courseware has become a new line in the teaching informatization; increasing number of teachers accepts it. The survey data (see Fig. 3.3.4) proves that nearly one-fifth (19.8%) of respondents at the universities are promoting “open courseware”; video “open educational resources” at Apple iTunes U are also emerging in Chinese universities - about 19 universities are promoting this new technology.

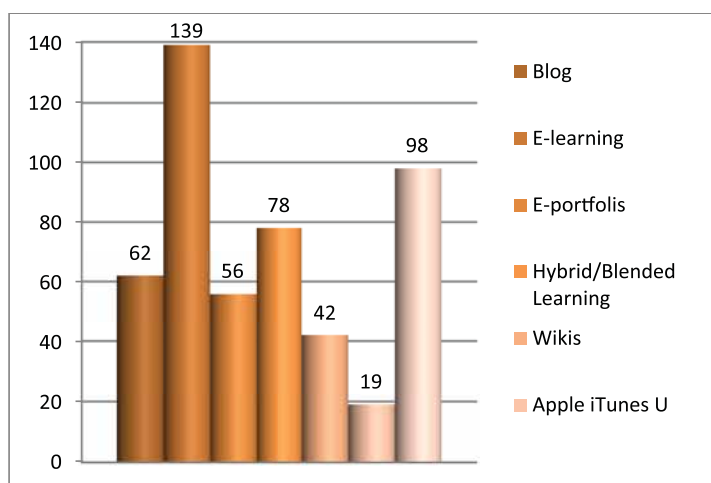


Fig. 3.3.4. Use of Open Educational Tools/Resources
Source: Guodong Zhao and Yuan Shuai (2010).

3.4 Technology Platforms Supporting OER

OER are resources that are to be used on computer and Internet, so various software and tools are needed to design, store and publish them. At present, there are many technological solutions for OER in Chinese universities, such as:

- Independent Open Course Websites;
- Open Courses Website based on Course Management System;
- Open Video Courses;
- Open Courseware Designed by E-learning solution tools.

3.4.I Independent Open Course Websites in Chinese Universities

At the beginning of the OER development in Chinese universities, independent course websites designed, developed and maintained by teachers themselves were typical. At the end of the 1990s, only a few university teachers were willing to open their teaching materials; furthermore, very few of them used PowerPoint slides or any other electronic materials in the teaching process, let alone course websites. Only some teachers, who once studied abroad or stayed as visiting scholars in foreign universities, heard about the Open Educational Resources movement and were ready to accept the idea of OCW and OER. Among those professors, some younger ones, who knew how to develop websites and other techniques, made the first attempts to open their teaching materials, such as PowerPoint slides, teaching programmes, reading papers, exercises and tests. To communicate with students after classes, some teachers even developed online forums on their course websites. In most cases, such course websites were also used as the teachers' homepages, where the cv, research papers or other materials were published as well. Fig. 3.4.1.1 displays a typical OER Course Website on General Chemistry designed by a teacher of the Peking University. Developed in 2003 and maintained for years without official

3. Technology Issues for OER in China

support, it is very popular in the area of Chinese chemistry lessons. According to incomplete statistics, in the 2000s, the total number of such OER course websites did not exceed 100, and most of them were supported by first-rate universities and colleges. Before the launch of the Chinese Quality Courses Project, these teachers were pioneers on OER in China. The teachers were not only the explorers of the idea of Open Educational Resources but also “experts” in programming and ICT. Their outstanding ICT skills and commitment allowed them to develop course websites without technological and financial support from their universities. At that time, website design was a high-tech skill in China, the market price of website construction was ten thousand Yuan, which is too expensive for a teacher to afford even now.

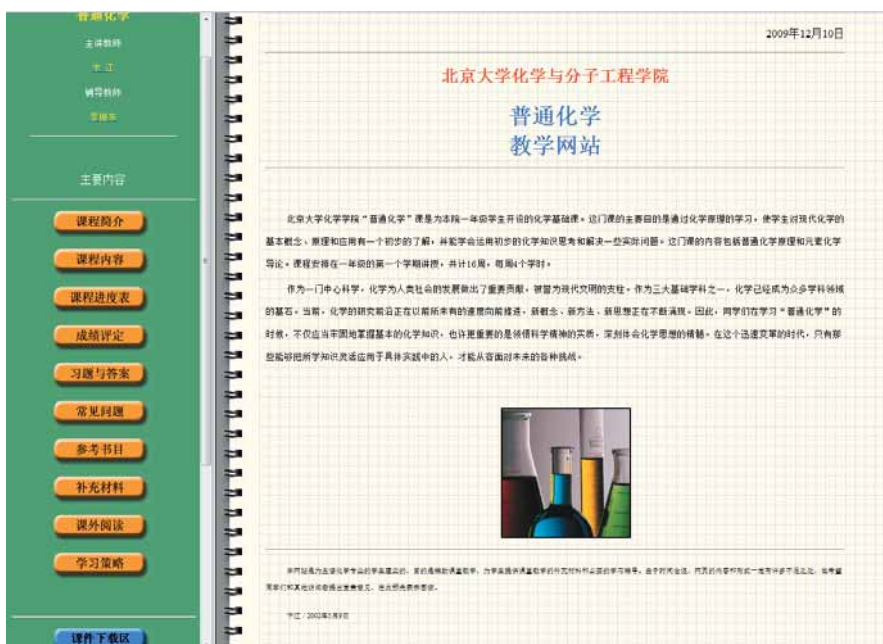


Fig. 3.4.1.1. An OER Course Website maintained by a teacher of the Peking University (<http://www.chem.pku.edu.cn/bianj/>)

According to the survey on those original course websites, the general tools used by these teachers included: FrontPage, Netscape Composer, Macromedia Dreamweaver, etc. The websites were often developed by B/S framework, the operating system usually used windows server, the database was Access, MySQL or SQ Server, the often used programme language was php, Java or C (see Fig. 3.4.1.2).

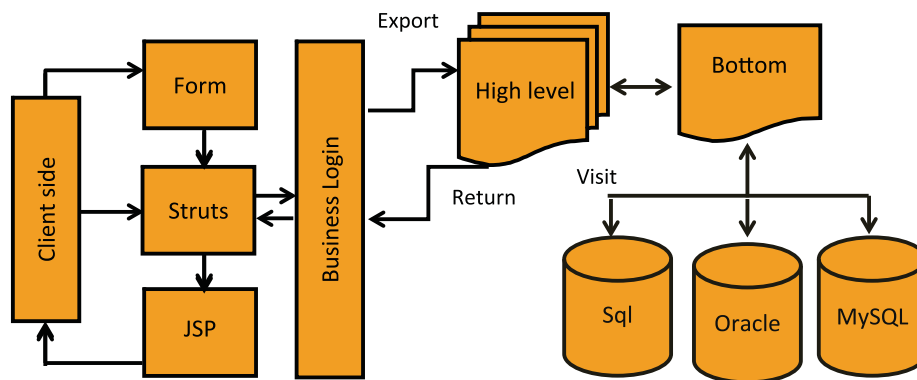
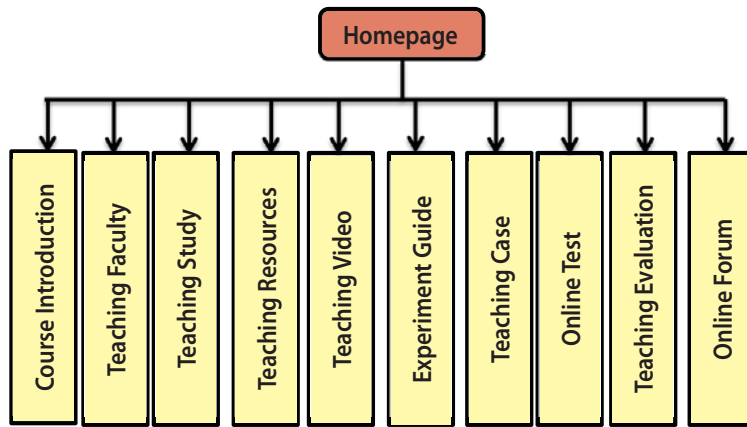


Fig. 3.4.1.2. Technical framework of OER Course Websites.

As to the functions, those course websites usually included the following components (see Fig. 3.4.1.3):



- Course introduction;
- Teacher personal details;
- Teaching programme;
- Online forum;
- Experiment handbook;
- Teaching reference.

Fig. 3.4.1.3. Functions of OER Website in Chinese Universities

In addition to the course websites designed independently by teachers, with the expansion of website creation software after 2000, many Chinese teachers who has less advanced IT-skills started using these solutions for the design and development of their own course websites. For example, the Sky Classroom is a kind of typical website builder software used in Chinese universities and colleges (see Fig. 3.4.1.4), due to its simple operation. In fact, the Sky Classroom is also used for creating websites of Quality Courses in some colleges.



Fig. 3.4.1.4. OER Course Website Created using Sky Classroom (<http://211.67.96.14/wlkc/>)

However, technically, almost all the course websites produced by such builders are HTML pages, which are not easy for the content updating. In addition, these website producers usually adopt simple ASP+ACCESS model, whose storage space and security involve some practical problems and, therefore, are not a good solution for the development of OER in Chinese colleges.

3.4.2 Open Course Websites based on Course Management System

In recent years, with the wide adoption of Course Management System (CMS)² in Chinese universities and colleges, the course websites created on the basis of CMS are becoming more and more popular, especially in some famous universities, which invest great efforts into the spread of e-Learning or Blended learning. In fact, the use of course websites based on CMS is regarded as an important measure of improving teaching quality. Table 3.4.2.1 presents the main functions of CMS used in Chinese colleges.

Table 3.4.2.I. Introduction to Course Management System

Tools	Functions
Communication Tools	Discussion Forum, Discussion Management, File Exchange, Internal Email, Online Journal/Notes, Real-time Chat, Whiteboard
Productivity Tools	Bookmarks, Calendar/Progress Review, Searching Within Course, Work Offline/Synchronize, Orientation/Help
Student Involvement Tools	Group work, Community Networking, Student Portfolios
Course Delivery Tools	Test Types, Automated Testing Management, Automated Testing Support, Online Grade Book, Course Management, Student Tracking
Administration Tools	Authentication, Course Authorization, Registration Integration
Content Development Tools	Accessibility Compliance, Content Sharing/Reuse, Course Templates, Customized Look and Feel, Instructional Design Tools, Instructional Standards Compliance

According to the latest survey data, in 2010, about 60.5% Chinese universities and colleges adopted the course management system in their campuses, 31.6% consider the opportunity of adoption in the near future. From the teachers' point of view, the most outstanding merit of using the course management system is that they can easily create multi-function course websites without getting diverse ICT skills, and a teacher can design a website without a support of IT technician. The number of course websites in Chinese colleges grows continuously. The survey data for 2010 indicated that 39.9% teachers in Chinese colleges had already built their course websites and more than 20% teachers said that they had often been using those websites in their teaching process. Some Chinese researchers believe that the popularity of such courses will intensify the usage of Open Educational Resources in China because teachers can easily open their course websites created by CMS, and it would support application of Chinese Quality Courses in the future. In particular, young teachers are often active in opening course websites to enhance their academic reputation and apply for a project and other academic activities.

² Course Management System: Virtual Learning Environment (VLE), Learning Content Management System (LCMS) and Learning Management System (LMS). In China, CMS is often called Online Teaching System.

Three types of CMS are used in Chinese colleges: a commercial product, such as Blackboard (see Fig. 3.4.2.1); open source software, such as Moodle (see Fig. 3.4.2.2) and Sakai; and home-grown CMS. According to the 2010 survey data (see Table 3.4.2.2), more than 70% of Chinese colleges purchase commercial software, 39.4% use home-grown CMS and 4.31% adopted OSS CMS.



Fig. 3.4.2.1 Peking University Academic Online - Blackboard CMS (<http://course.pku.edu.cn>)



Fig. 3.4.2.2. OER Website Created under Moodle (<http://www.emoodle.org/>)

Table 3.4.2.2. CMS used by Chinese Colleges

Course Management System	Share (%)
Blackboard	74.2
Tsinghua Education Online	6.4
4A Teaching Platform	3.87
Excellence Online Course Centre	6.45
OSS CMS (Sakai/Moodle)	4.31
Home-grown CMS	39.4
Others	7.10

3.4.3 Open Video Courses in Chinese Universities

With the development of Internet broadband in Chinese universities and colleges, some other technological solutions, such as Interactive Online Video Conference System, Lecture Capturing System, etc. have been more widely introduced in the teaching process, which is also a good choice for designing and developing OER. Compared with the above-mentioned methods, since audio and video materials are apparently more attractive than text and graphic web pages, they help increase students' learning motivation.

Nowadays, Adobe Connect Pro, Apple Podcast Producer and Echo 360 are the most popular systems used for the development of open courseware in Chinese colleges. For example, Peking University (PKU), the most famous university in China, was the first to use Adobe Connect Pro (see Fig. 3.4.3.1) as a rapid e-Learning tool in 2006.

More and more PKU faculties use Adobe Connect as a video courseware tool in the classrooms, because it helps easy recording of the whole lecture including audio, video and PowerPoint slides on the same screen (see Fig. 3.4.3.2). Teachers can publish the video URL on the course websites and let students browse them after classes by using PC, iPhone and other devices.



Fig. 3.4.3.1. OER Video Website Based on Adobe Connect in PKU.



Fig. 3.4.3.2. OER Video Courseware Recorded by Adobe Connect Pro (<http://vclassroom.pku.edu.cn/p37037928/>).

Apple Podcast Producer is also a good technological solution for the video courseware. For example, PKU Lecture Online (see Fig. 3.4.3.3) is a very famous OER website in China that publishes academic lecture videos and attracts many visitors out of campus every day.



Fig. 3.4.3.3. PKU Lecture Online Website Based on Apple Podcast Producer (<http://lecture.pku.edu.cn>)

3.4.4 Open Courseware Designed by Rapid e-Learning Tools

Various rapid e-Learning softwares and tools are often used for the Open Educational Resources in Chinese colleges. Using these tools, ordinary teachers can design and develop professional courseware rapidly and at low cost, which makes the courses more attractive.

According to the literature, the most popular rapid e-Learning tools in Chinese colleges include the following:

Table 3.4.4. The Most Popular Rapid E-learning Tools

Item	Main Functions	Technological Features
Raptivity Software	Raptivity is a rapid development software tool that comes with a library of pre-built templates, most of which are interactive. Pre-built templates provide a way to quickly assemble an interaction or presentation segment and publish it in Flash (.swf) format. Teachers can use Raptivity to create a stand-alone course or import the published file into another tool, like Articulate Presenter or Captivate.	Create interactive eLearning content in short time and at low cost. Leverage Raptivity library of pre-built interactions based on best practices in instructional design. Completely customize each interaction. Create a single Flash File for the eLearning interactivity.
Adobe Captivate	It can add software demonstrations, interactive simulations, branching scenarios, and quizzes to the courseware without programming, Easily integrates the content with e-Learning applications and leading SCORM- and AICC-compliant Learning Management Systems to deliver content virtually anywhere.	With the new optimized interface of Adobe Captivate 5, the time required to create software simulations is significantly reduced compared to earlier versions.
Adobe Authorware	Authorware is a visual authoring tool for creating rich-media e-Learning applications for their delivery on corporate networks, CD/DVD, and the Web. Develop accessible applications that comply with learning management system (LMS) standards.	Creates courseware that can connect to LMS systems and complies with standards from the Aviation Industry CBT Committee (AICC) or the ADL Shareable Courseware Object Reference Model (SCORM).

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Item	Main Functions	Technological Features
Articulate Rapid e-Learning Studio	Articulate Rapid e-Learning Studio 09 includes: Articulate Presenter; Articulate Quizmaker; Articulate Engage, Articulate Video Encoder	All tools work together seamlessly and enable inserting selected quiz slides into the course, setting options for how participants navigate based on their assessment results, importing video and converting it to Flash, and adding interactive content.

By using those rapid e-Learning tools, the Chinese teachers reduce the cost and time spent for courseware design, which encourages them to produce higher quality open educational resources.



4. OER Projects in China

4.1 The National Cultural Information Resources Sharing Project

The National Cultural Information Resources Sharing Project (hereinafter “NCIRS”) is a cultural programme undertaken by the Ministry of Culture of P.R. China. The government provides freely accessible materials for the general public, especially for those living in remote underserved rural areas. The objective of this project is to improve the information accessibility in underdeveloped regions of China to reduce the “digital gap”. The project provides access to e-books, video, audio and other materials for the public as a mean of cultural consumption and also as educational resources. Resources with clear educational purposes include agricultural and husbandry techniques, legal training materials, traditional opera performances, etc. This project is primarily undertaken by public libraries.



Fig. 4.1.1. Lectures navigation page at NCIRS website (<http://www.ndcnc.gov.cn/>)

The first step of NCIRS is to collect, integrate and digitize high-quality cultural, scientific and educational resources. A special network was established by the government and libraries to share the resources utilizing the Internet, satellite, media discs, cable TV and digital TV network. The project is highly regarded by the government and was listed as one of the *Most Important Public Cultural Programmes* as per *Outline of the Eleventh Five-Year Plan for National Economic and Social Development of the People's Republic of China*.

Most recently, the project established 614,000 sharing centres and service providers; and now it holds 69 TB of digital materials. The government extranet connects 28 provincial sub-centres, with a daily traffic of 100 GB at its peak. More than 540,000 personnel (including both part-time and full-time workers) works for the project, they are responsible for collections of materials, resources integration and digitization, technical support and network maintenance.

Topology of NCIRS Project

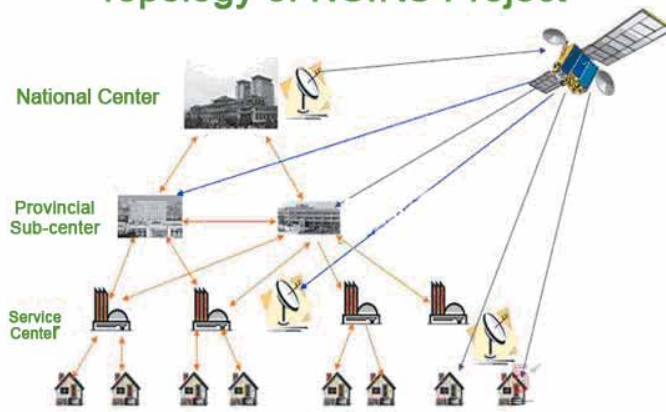


Fig. 4.1.2. Topology of NCIRS Project

The project of NCIRS is still under intensive construction. The long-term objective of the project is to establish a network structure for an ultimate sharing junction. The project undertakes a “1-3-5” Project, i.e. one national sharing centre, 30 provincial sub-centres and more than 5,000 root service centres (root centres are based in communities, streets, villages or towns). When the project is over, an independent network connecting libraries and cultural centres in more than 5000 towns, villages, streets or communities will permit free use of resources by the general public.

Another objective is to develop an index for a great resource pool. The index shall contain all cultural and educational resources available in libraries, museums, art galleries and art research centres, etc. All existing materials will be integrated and digitized. The index will facilitate navigation through the resource pool. For this purpose, the project is currently compiling, digitizing and sharing one million literature pieces, 1000 operas, 1000 musical works and 1000 fine art works online.

The core mission of NCIRS is to collect resources and establish an open database. According to the actual needs of the public, NCIRS will integrate existing copyright materials and purchase more digital resources to create knowledge repositories, including laws, culture, music, fine art, opera, science, technology, etc. A latest plan is to achieve the volume of 5 TB.

In order to avoid duplication for most popular resources, NCIRS organizes libraries to digitize such resources jointly and create a fundamental knowledge repository for such materials.

One more objective is to establish a service network: based on the index, NCIRS will create an online navigation system for browsing its resources. The project will establish one independent exchanging and communication mechanism based on each layer of service centres, in order to support high-speed sharing between those service providers.

In addition to creation and compilation of resources, the national centre also provides a number of online services:

- 1) Establishing and providing an all-in-one index for online resources.
- 2) Developing a data synchronization interface, hence enabling provincial sharing centres and basic service centres to synchronize their data through the existing network. In some developed regions

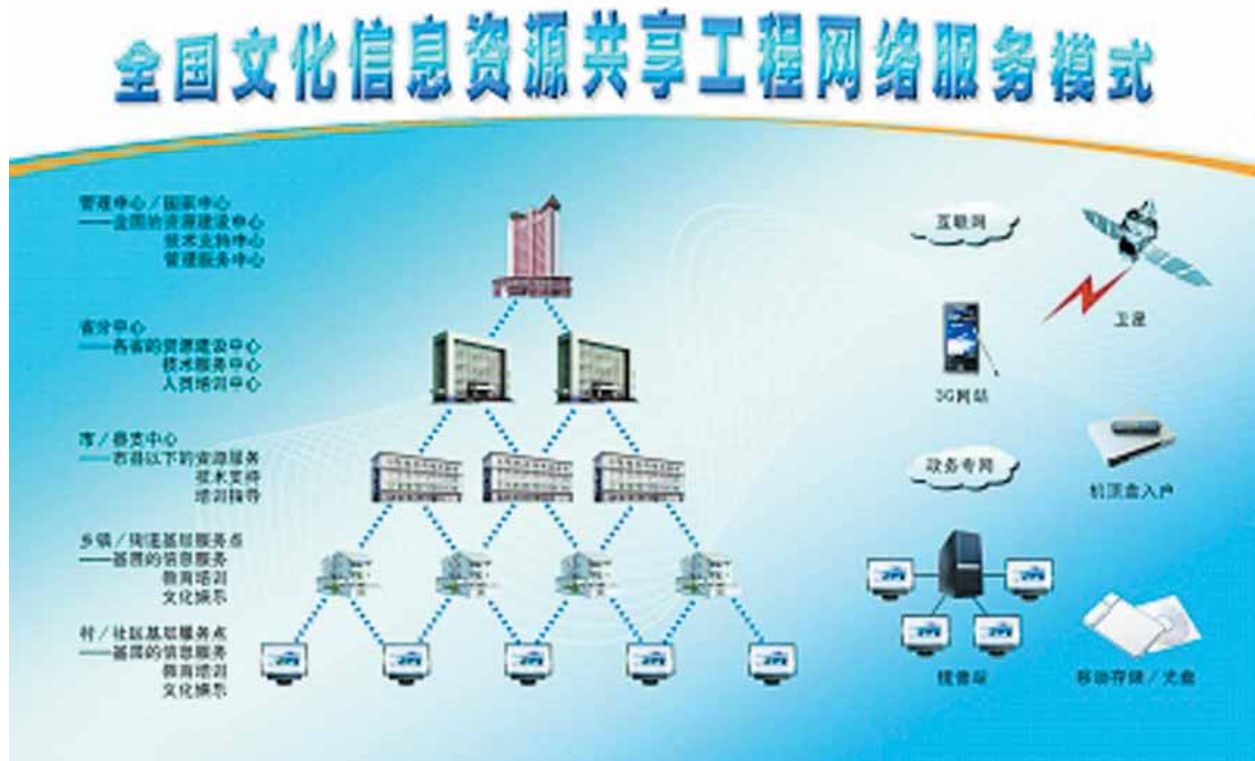


Fig. 4.1.3. The Service Mode of NCIRS Project

where the network speed is faster, the provincial centres and basic centres may send requests online and download data directly through the Internet.

3) Packing the requested data and broadcasting it via satellite (the number of users is unlimited, the mechanism is conflict-free and the costs are much lower. This approach is designed for underdeveloped regions with poor Internet connectivity).

4) Packing the requested data in CD or HD and sending to various sub-centres for update.

Provincial sub-centres are established in province-level administrations including autonomous regions and municipalities. They provide services for local users. There are also sub-centres based on industries, each provide services for a specific industry.

In view of different local network capacity (including but not limited to the Internet), provincial sharing centres may have different modes of Internet services. Basic sub-centres are available in cities, towns, villages, streets and communities, and they may be established in institutions or enterprises that have an intranet, and in elementary and middle schools as well. Their only mission is to provide resources for the best convenience of local users.

4.2 Chinese Quality Course Project

To implement the higher education quality standard, the Chinese Ministry of Education initiated in 2003 a China version of the Open Courseware Project — the Chinese Quality Course Project (CQC, Jingpin kecheng, 精品课程计划) following MIT OCW model. This large-scale project aims at promoting Open Educational Resources to improve the quality of the undergraduate education in the Chinese higher education system. The main aims of the CQC project are to enhance several aspects: teaching contents reform and modernization, management system of the high-quality courses, and courses system reorganization. This set of measures has improved the teaching quality and research levels and also offered new opportunities for learning.

At present, the procedure of CQC design follows the pattern: unprompted development of courses, recommendation by autonomous regions and municipalities, evaluation by the Ministry of Education, acceptance as CQC and, finally, allocation of financial support. The state and municipal education bureaus and colleges have increased the funds allotted for the Quality Courses development.

By the end of December 2009, 6469 courses produced by 959 colleges and universities (distributed over 31 provinces) underwent evaluation. Of those, 2212 courses produced by 819 colleges and universities were accepted as CQC. As much as 4.23 billion Yuan were invested (of which 2.21 billion by colleges and universities, 1.11 billion by governments and authorities and 1.11 billion by colleges and universities levels) to ensure production of CQC, which has supported the course teaching reform and further enhanced teaching capacity (Table 4.2.1).

Table 4.2.I. Number of CQC (2003–2009)

Year	Courses submitted	Courses selected
2003	467	127
2004	720	249
2005	940	258
2006	980	358
2007	1102	411
2008	1172	400
2009	1195	409

CQC is a significant criterion to assess not only the teaching quality but also the overall strength of colleges and universities. Therefore, most Chinese universities pay special attention to the construction and realization of CQC under unified planning. In addition to the construction of the basic course system already accomplished over the years, some universities are determined to speed up CQC construction and align some of them with the requirements of provincial and national standards. A batch of college-level demonstration courses are to be established and course teaching demonstration systems at the national, provincial and college levels are to be progressively formed. To accomplish these targets,

4. OER Projects in China

universities and colleges should apply modern approaches, deepen understanding, improve the course teaching contents and methods, and find new systems.

When the Chinese Quality Courses Project was launched, there was no single and easy portal for accessing all the available courses. Each university built its own index site, and the Ministry of Education published links to these sites and to individual courses. Other organizations, such as the China Open Resources for Education, also developed link sites providing an overview of courses containing very brief information, such as the title of the course, the university where it was taught, and the level (university, provincial or national level). As the number of available courses grew, the system became very unwieldy. When the Chinese Quality Courses Project was renewed in 2007, a unified portal for all CQC - the National CQC Online (<http://jingpinke.com>) - was set up by the Higher Education Press. The portal is multi-faceted, rich and functionally advanced. Visitors can browse courses by discipline, university or level, and there are lists showing the most frequently visited courses in various categories. For each course, the portal imported a number of resources into a resource database, so that one could use individual PDFs, videos and other resources without leaving the portal or referring to other sites.

There are many social “Web 2.0” features: logged in users can save links to courses on their personal page, rate courses or provide comments. Users can also post comments or questions about specific resources (individual documents and videos). The list of courses that correspond to visitor’s profile and are similar to those accessed by him/her is provided by the site, each item in the list is a link to the course website.

In addition to featuring all the Chinese Quality Courses, the site is a clearing house for information about the project, with the updated policies and latest news, information on admission, forthcoming courses and

The screenshot shows the homepage of the National CQC Online. At the top, there is a search bar and a navigation menu with tabs for '首页', '资讯中心', '课程中心', '资源中心', '教材中心', '资源联盟', and '课程申报'. Below the navigation bar, there are three main columns: '课程' (Courses), '资讯' (News), and '资源' (Resources). The '课程' column lists various course categories like '本科课程', '高职高专课程', and '名师名课'. The '资讯' column features a large article titled '“十一五”中国教育的收获与成长' (Achievements and Growth of China's Education in the 11th Five-Year Plan) with a sub-headline '人民群众所期待的教育，既是公平的教育，也是向质量甚至高质量的教育。所以，政府、学校和社会的发力方向必将高度一致。' (The education that the people expect is both fair and towards quality, even high quality. So, the direction of effort from the government, schools, and society will be highly consistent.) The '资源' column lists various resources like '教学课件', '电子教案', '教学录像', etc. Below these columns, there is a '每日关注' (Daily Focus) section with a sub-headline '2011研究生招生前瞻' (Prospect of 2011 Graduate Admissions) and a '推荐精品课程' (Recommended Quality Courses) section listing various courses like 'C语言程序设计', '宏观经济学', '毛泽东思想和中国特色社会主义...', etc.

Fig. 4.2.1. Homepage of the National CQC Online (<http://www.jingpinke.com/index>)

seminars, etc. There is an overview of teaching materials that were awarded excellence and an intra-university sharing portal.

According to the Brief report of Chinese National Quality Courses Online (2011, Volume 5), the total number of OCW has achieved 24446 in May, 2011, including 20284 domestic courses (3835 national level, 8279 provincial level, 8170 university level) and 4162 OCW page links to foreign universities and colleges in such countries as the USA, Canada, Japan, Australia and Great Britain. As much as 44832 textbooks have been made available through sharing platforms. The total available data online for 2011 is 16.85 TB.

Table 4.2.2. Resources of the National CQC Online

Item		Number
Chinese Quality Courses	National level	3835
	Provincial level	8279
	School level	8170
	Foreign OCW	4162
Resources	Teaching resources	1256400
	Textbooks	44832
Visit Statistics	Number of visits	11615023
	Pages visited	61812435
	Share of New Users	50.52%
Data Store	Total Store Space	28TB
	Available Data Online	16.85TB

Source: Brief report of Chinese National Quality Courses Online, 2010, Volume 5.

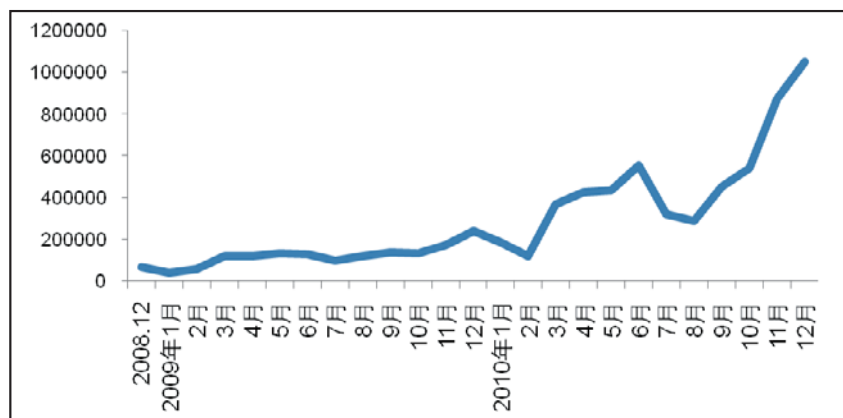


Fig. 4.2.2 Unique IP visitors per month of Jingpinke.com (Dec-2008 – Dec 2010)

This report has provided a lot of detailed information for the website jingpinke.com itself: up to May, 2011, the total number of users' visits to the website has achieved 11615023, and 1301232 various formats of resources have been posted while 214010 downloads has been recorded. More than a million registered users, including 403620 registered with real

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name and coordinates, are frequent visitors of the website. According to the report, 49% visitors are students and 40% are teachers from all educational levels.

The CQC project has established a uniform evaluation standard, known as “first class in five facets”: first-class teaching group, first-class teaching content, first-class

teaching methods, first-class teaching textbooks, and first-class teaching management. All OCW will be evaluated again in five years to ensure quality. The project provides metadata and links to OCW; and it collects, categorizes and tags teaching resources - more than 1 million items. Currently, the project website presents more than 50000 textbooks with sample chapters supporting online preview, and a video column featuring live lectures of top professors. Using a unified technical standard, the project will further upgrade nation-wide public service platform, to open and share quality educational resources.

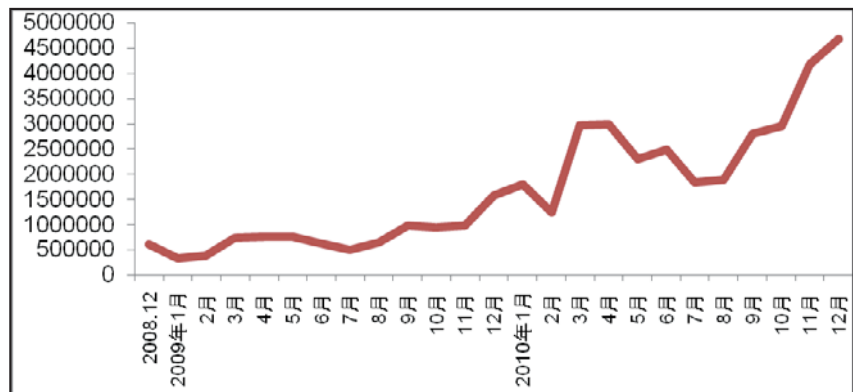


Fig. 4.2.3. Page views (PV) per month of Jingpinke.com (Dec-2008 – Dec 2010)

4.3 The National Science Data Sharing Project

Since 2002, the Chinese government has initiated a Science Data Sharing Project (SDSP). It is a cross-domain and cross-region scientific infrastructure project, which collects scientific data from operating national projects and programmes, as well as accumulated data from various industries. There are nine test sharing centres of collected scientific data. The government has established the organizational network including experts, administrative office and negotiation team between ministries. The project contributes to sharing technology, policies and regulations, related legislations and service test.

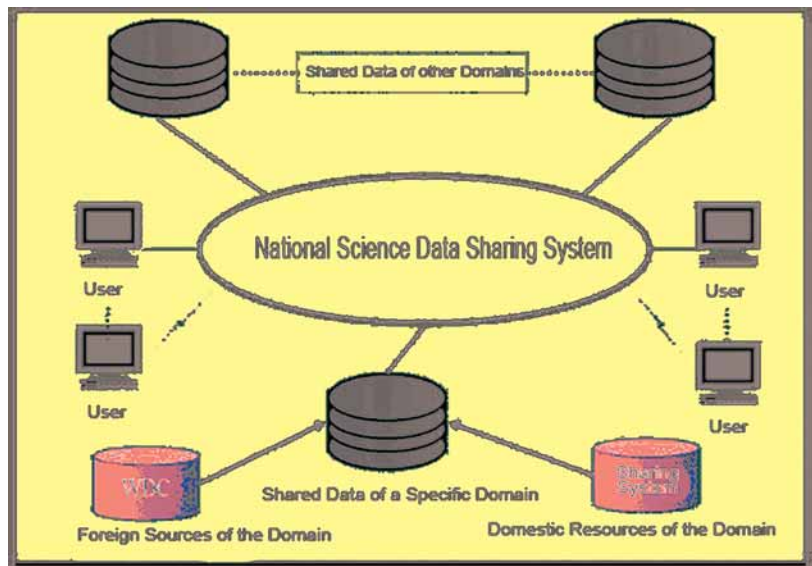


Fig. 4.3.1 The Sharing Mode of Science Data Project.



Fig. 4.3.2. Homepage of Science Data Sharing Project (<http://www.sciencedata.cn/index.php>).

A long-term plan is to establish 50 science data sharing centres or data sharing networks, which will focus on energy and environment, agriculture and forestry, medicine, material science, traffic and information technology.

Science Data Sharing Project covers many subjects. There are centres for marine data, meteorological data, medical data, earthquake data, etc. Each centre has its own administration system, navigation system, evaluation standard and data organizational structure. For example, the marine data centre features hydrological information based on time, longitude and latitude of a specific area. The users can run a query for the date and geographical position and immediately get the requested information. If the online data are not sufficient, the sharing centre can also provide offline data in other media and format.



Fig. 4.3.3. Marine Data Sharing Centre Retrieval System (<http://mds.coi.gov.cn/>).

Since Creative Commons licenses were ported and officially launched in Beijing in 2006, more and more user-generated websites, institutional repositories and collaborative communities adopt CC licenses to publish their resources. Those materials include popular science works, theses and e-preprint, manuals, courseware and tutorials and are utilized for education and research purposes. With their copyright status clearly indicated, these materials may be re-used or re-purposed freely and legally.

4.4 The National Science Library Institutional Repository

The National Science Library of China (NSLC), is a public library service system of the Chinese Academy of Science (CAS) as well as the Chinese National Science and Technology Libraries (NSTL) system.

Managed by a Board of Trustees appointed by CAS, NSLC consists of the Main Library (based in Beijing, formerly the Library of CAS) and three branch libraries, respectively the Lanzhou Branch Library, the Chengdu Branch Library and the Wuhan Branch Library. NSLC also co-operates with selected CAS research institutes and a number of special branch libraries to provide specialized information resources and services. It established an institutional repository (the National Science Library – Institutional Repository, NSL-IR) to release science literature under Creative Commons licenses. In terms of research capacity, it is one of the most advanced open resources repositories in China.



Fig. 4.4. Homepage of NSL-IR (<http://ir.las.ac.cn/>)

The basic function of NSL-IR is to save and host all materials published by NSL staff. However, for monographs the copyright issues are comparatively more complicated; and therefore NSL-IR includes only title, preface and postscript. Only after getting licenses for dissemination NSL-IR may post the entire works online. NSL-IR requires real-name-registration. A contributor of resources shall apply for an account under his real name and be fully responsible for the content and copyright of the resources posted under his name.

All resources available in NSL-IR are released under the Creative Commons license. Anyone can download, use and re-purpose these resources for learning and research purposes as long as the author and source of the material are indicated. NSL-IR further requires that for resources, which were initially published in journals and conference proceedings, the users must indicate the source. The users shall not use the materials for commercial purposes and shall not produce derivative materials without the consent of the copyright holder of the materials.

The National Science Library has established a special department to supervise and examine all submitted materials to ensure that the content of submitted materials is legal in terms of copyright.

NSL requires that the numbers and integrity of resources submitted should be in line with the project terms. For the projects directly funded by NSL or funded through NSL projects, the output data or thesis shall be submitted in time, otherwise the financing of the project will be terminated and proposals of this applicant will never be supported again.

4.5 Center for Contemporary Cultural Studies

Cul-studies.com is the first website concentrated on contemporary culture studies and teaching in China. It is hosted by the Centre for Contemporary Culture Studies (CCCS) of the Shanghai University, providing culture-related news, reviews, literature and courses to the public. All contents on the website are released under Creative Commons – Attribution – Noncommercial – Nonderivation China Mainland version 2.5 licenses. It presents articles and thesis in various columns, including cultural forums, book reviews, cultural news, foreign literature and commentaries. It collects and hosts the latest research achievements of the most renowned scholars; and it has connections and links to multiple academic journals to provide free information.

The website focuses on the education and learning of the new subjects of Cultural Studies. It presents a number of full courses which are the very first professional online courseware in this subject. It also provides basic information of the courses presented by other universities and institutes. Currently, there are 6944 Chinese and 251 English articles and theses free to view, share and re-use on the website. The materials are used by 6927 registered members.

课程讨论区		
 文化研究联合课程 上海大学、华东师范大学、复旦大学、上海师范大学四校联合课程	TOORV 0 TOPIC 169 POST 460	主题: 代办大学国内外文凭认 作者: zx2c232 日期: 2010-10-24 15:54:29
 文学导论 讲课老师: 王晓明 董丽敏 孙晓忠	TOORV 0 TOPIC 31 POST 66	主题: [公告]海子诗歌一讲 作者: 10124585 日期: 2010-10-22 20:23:12
 大学语文论坛 大学语文讨论园地	TOORV 0 TOPIC 27 POST 62	主题: [原创]因%o专业代理 作者: 地瓜秧 日期: 2010-10-22 11:32:51
 文化研究导论 主讲老师 罗小茗(上海大学)	TOORV 0 TOPIC 57 POST 157	主题: 【阅读篇目】王晓明: 作者: 菩提树 日期: 2010-9-15 16:26:00
 中国近代思想与文化文献研读 主讲老师 王晓明(上海大学)	TOORV 0 TOPIC 133 POST 317	主题: [转帖]共和百年反动 作者: 十秒 日期: 2010-6-19 10:41:00
 文化研究文献选读及读书会 主讲老师: 王晓明 孙晓忠(上海大学)	TOORV 0 TOPIC 52 POST 221	主题: 当代文学与文化“热风” 作者: 刘佳俊 日期: 2009-4-2 17:22:00
 国学专书讲读 华东师范大学精品课程 主讲老师: 胡晓明 方勇 王冉冉 查正贤	TOORV 0 TOPIC 650 POST 994	主题: ★不要误解老子“绝圣” 作者: 归朴子 日期: 2010-10-12 12:28:59
 文化研究导论 主讲老师: 乔焕江(哈尔滨师范大学)	TOORV 0 TOPIC 41 POST 138	主题: 错失的联合——法兰克 作者: 求缺 日期: 2009-5-5 10:24:00
 中国现代文学 主讲老师: 徐志伟(哈尔滨师范大学)	TOORV 0 TOPIC 38 POST 202	主题: 生活最重要 作者: 小小兔 日期: 2010-3-24 21:40:00
 中国现代文学 主讲老师: 罗小茗(上海大学)	TOORV 0 TOPIC 78 POST 243	主题: 期末作业—— 作者: 我啊 日期: 2010-6-16 7:34:00
 现代文学研究与当代生活 主讲教师: 王晓明(上海大学)	TOORV 0 TOPIC -29 POST 128	主题: 链家乘车链家普通住宅 作者: 平平安安 日期: 2010-10-24 5:07:29
 当代批评理论:文学史与思想史 主讲教师: 罗岗 倪文尖(华东师范大学)	TOORV 1 TOPIC 235 POST 592	主题: 罗岗、倪文尖:从文学 作者: 墨小朵 日期: 2010-10-25 12:39:20

Fig. 4.5. Forum for course discussions at Cul-studies.com (<http://www.cul-studies.com/bbs/list.asp?boardid=2>)

4.6 China Open Resources for Education

The China Open Resources for Education (CORE), a non-profit organization established in October 2003, is a consortium of universities that started with 26 IET Educational Foundation member universities and 44 China Radio and TV Universities (hereinafter "CRTVU"). CORE is supported by the Chinese Ministry of Education (MOE). Its mission is to enhance the quality of higher education in China through introducing advanced courseware from MIT and other top-ranked universities around the world, using the latest information technologies, teaching methodologies, instructional content and other resources. CORE also shares the advanced Chinese courseware and other quality resources with universities over the world.



Fig. 4.6. Homepage of China Open Resources for Education (<http://www.core.org.cn/>).

During recent seven years, CORE focused its efforts on the following activities:

Promoting the Use of MIT OCW in Chinese Universities and Colleges

CORE encourages professors and teachers to use OCW in teaching practice. By 2010, 157 comparative studies of MIT OCW have been completed and used in Chinese universities and colleges. According to CORE website statistics, about 2000 MIT OCW and 461 OCW that had been translated into Chinese were used by CORE members and non-member universities and were incorporated into the teaching repository of CRTVU for use in its training centres.

Organization of Translation of MIT OCW into Chinese

CORE organizes professors from its member universities and volunteer teachers and students to participate in the translation of OCW. It released 478 OCW on its website, including 461 from MIT, 7 from Tufts University, 4 from Utah State University, 3 from Johns Hopkins University and 3 from Sofia.

Many volunteers have contributed to CORE activities. According to the incomplete statistics, over 4000 volunteers wished to join CORE for OCW translation and over 1000 volunteers actually undertook translation and proofreading job. The number of OCW translated by volunteers exceeded 200.

Translation of Chinese Quality OCW into English

To expand the use of Chinese OCW, CORE revised 669 Chinese Quality OpenCourseWare (CQOCW) and linked them to its website by the end of 2009, the total number of CQOCW on CORE website exceeded 2400. Thus, 31 CQOCW were translated into English in such disciplines as architecture, art, chemistry, electronics, geography, medicine, philosophy, etc. All these CQOCW were released on CORE website and its member universities' websites.

Developing Open Source Software

In collaboration with the Peking University, CORE finished the localization of the Chinese versions of Sakai, eduCommons and Moodle, which are being used by CORE and its member universities. A comparative study on the potential integration of the various open education software was completed. CORE is cooperating with CRTVU to develop a new and more versatile OCW publishing system for Chinese universities.

4.7 Xiamen University Institutional Repository

The Xiamen University Institutional Repository (XMU IR, <http://dspace.xmu.edu.cn/dspace/>) is designed to host quality academic works, journals, conference abstracts, research data and presentations made

at academic events. The university expects the repository to be a well-maintained database for all its academic achievements and to provide easy access for scholars within the country and abroad. The repository is also considered to be a response to the e-publishing policy and Open Access movement. All content is submitted by professors and students of Xiamen University and is published under a CC-BY-NC-SA 3.0 version unported license.

Fig. 4.7. Homepage of Xiamen University Institutional Repository (<http://dspace.xmu.edu.cn/dspace/>)

4.8 Chinese Journal of Lung Cancer

The Chinese Journal of Lung Cancer, a bimonthly OA journal, is hosted by the Chinese Anti-Cancer Association, the Chinese Anti-tuberculosis Association, and the Tianjin Medical University General Hospital. It was established in 1998 and indexed in DOAJ, EMBASE/SCOPUS, CA, AJ-VINITI, WANFANG, etc. The Journal publishes editorials, original research, review articles, short communications, case reports on clinical and basic-science aspects of topics in Lung Cancer (prevention, epidemiology and etiology, basic biology, pathology, clinical assessment, surgery, chemotherapy, radiotherapy, etc.). It is published under the CC-BY 3.0 unported license.



Fig. 4.8. Homepage of the Chinese Journal of Lung Cancer (<http://www.lungca.org/>).

4.9 International Journal of Agricultural and Biological Engineering

The International Journal of Agricultural and Biological Engineering is an international peer-reviewed open-access journal sponsored and published jointly by the US-based Association of Overseas Chinese Agricultural, Biological and Food Engineers and the Chinese Society of Agricultural Engineering. The journal is published in both online version and hard copy. It aims at developing agricultural and biological engineering, promoting the prosperity of academics, and improving international academic exchange and cooperation. This journal provides a home for the latest high-quality research concerning the agricultural, food and biological engineering and the application of bio-agricultural engineering techniques in all areas of agriculture. It features works of great significance, originality, and relevance in all the concerned areas. The journal is published under the CC-BY 3.0 unported license.

4.10 Songshuhui Community

The community of Songshuhui (literally “Science Squirrel Club”) is a non-profit organization dealing with science popularization among general public. Established in April, 2008, Songshuhui community is considered as a group of the best Chinese science writers.



Fig. 4.10. Homepage of Songshuhui.net (www.songshuhui.net)

and science-related professionals – can point out mistakes in a specific article, which helps authors to improve their texts. CC is without any doubt an excellent supplement to this mode. Due to the superior quality of contents, Songshuhui.net becomes one of the most popular websites in popular science in China. It has won numerous awards and prizes for its contribution to the education of general public.

The website of Songshuhui.net publishes all materials under the Creative Commons Attribution – Noncommercial – Nonderivation China Mainland 2.5 version license. All literary works and other materials can be downloaded and published elsewhere. Furthermore, the website established a close relationship with traditional media. The Songshuhui Community as an organization also helps its authors to negotiate payment with media, and it is famous for achieving much more beneficial agreements for the community authors.

4.II Qiji Scientific Literature Repository

Qiji.cn is a Chinese open scientific literature repository. Ji Yanjiang, the founder of this website, learned about Creative Commons from the Public Library of Science (PloS) even before CC was introduced in China. He then adopted the unported CC license for the contents on qiji.cn website and rendered a Chinese version of the Common Deed of the CC license on that website. Currently, qiji.cn offers 1300 theses and preprints that are under ported Creative Commons licenses.

Apart from e-preprints for academic publications, Qiji.cn also hosts a number of columns providing open resources: science news, an encyclopedia, visual art, forums, social science reviews, education-related articles, online Q&A, reference materials on various subjects, computer and network knowledge, travels and job-hunting. These columns are designed for the convenience of academics.

The content of the site is generated and maintained by professional editors and a community of voluntary authors. The authors' community contributes to popularization of scientific articles, and the full-time editors are responsible for assuring the quality. Every single paragraph posted is submitted to the reviews of editors and professionals. By implementing Web 2.0 system, users of the website – with a large proportion of scientists

4. OER Projects in China

The Qiji.cn Encyclopedia includes 27208 entries and is still growing. The encyclopedia aims to share personal study notes and materials. Users can submit and edit their own materials, but are not allowed to edit the materials authored by the others.

Browsing and downloading materials on Qiji.cn are totally free. Users may access any material through a built-in search engine or a well-arranged index. To contribute a new content, the user has to create an account. After activation, users can submit or edit their articles. As opposed to the rules of Wikipedia, only the contributors may modify their own works.



The screenshot shows the homepage of Qiji.cn. At the top, there is a search bar and navigation links. Below the search bar, there are several featured articles with images and titles. A sidebar on the right contains a detailed index of subjects, including Physics, Engineering, and Computer Science. The page layout is clean and organized, with a focus on providing access to a wide range of educational materials.

Fig. 4.11. Homepage of Qiji.cn (www.qiji.cn)

On April 16th, 2006, the website initiated the Qiji Translation Project to organize its users to do the translation of academic materials from open access journals including PLoS and APS: 29 phases were completed, 294 theses were translated. All translations are available under the Creative Commons Attribution China Mainland 2.5 version license.

Qiji.cn is a non-profit project funded by personal donations and advertisement incomes. The founder and administrators are volunteers from universities.

4.12 The Project of China NGO 2.0

Funded by Ford Foundation in Beijing in 2009, NGO2.0 project (www.ngo20.org) serves grassroots NGOs in the mid-west provinces of China. One of the main areas of NGO2.0 Project is the annual Web 2.0 workshops that enhance the digital literacy and online marketing capabilities of grassroots NGOs. Those workshops provide courseware and all website content under the Creative Commons Attribution – Noncommercial – Nonderivation China Mainland 2.5 version License. The official website of NGO2.0 is also published under the same license.

Participating NGOs are selected from six NGO issue domains including environmental protection, health care, community development, women and children, education, and information technology. The criteria for selecting NGOs are:

- Medium size;
- A strong ability in online promotion and applications;
- Need to improve development, especially web-based development.

Each workshop is attended by executive officers of 25 to 30 NGOs.



Fig. 4.12.1. Offices of NGO 2.0 Project

Utilizing case studies as an important pedagogy, those workshops involve professional teachers from MIT and the University of Science and Technology of China – the founding institutions of NGO 2.0 to teach the trainees. The project also invites participants of earlier workshops to share their latest practical experiences of using social media tools with new students. Their programmes, as well as free resources, are provided in the following categories:

- The Internet culture and the spirit of Web 2.0: open, transparent, participating, sharing, network, innovative;
- Tools and applications for Web 2.0: blog; micro blog; open mapping; RSS, SNS, Wiki, Skype, search engine optimization, Witkey, Listen 2.0 literacy, video production and sharing, etc.
- Website building: various approaches for establishing the organization's website, especially LAMP (Linux-Apache-MySQL-PHP) system and Wordpress blog websites.
- Digital Marketing: brand positioning, blog marketing, viral marketing, multi-media promotion, SNS promotion, instant message promotion, etc.



Fig. 4.12.2. A Free Courseware Released with CC logo

NGO 2.0 Project also encourages trainees to take on the role of trainers who will afterwards host small-scale Web 2.0 workshops in their home towns and cities. This mechanism of “2.0 Sharing Mode” has already been put into practice in major mid-west cities: Kunming, Nanning, Lanzhou, Shenzhen, and Chengdu. The project organizers expect that this peer-to-peer sharing mode will further help them to extend their training system from cities to regions and that in the long run, mutual ICT learning groups will be developed by NGOs based in target regions. The project also organizes online communication platforms, building virtual communities on QQ groups to facilitate discussions about technological and NGO-related issues among the trainee NGOs.

4.I3 Kong Bohua TCM School

The Kong Bohua Traditional Chinese Medicine (TCM) School is based at the Kong Bohua Clinic. It trains doctors of Traditional Chinese Medicine and promotes the culture of TCM. All materials, including courses of the school, are released under a Creative Commons license.

The educational patterns of Traditional Chinese Medicine differ very much from the western one, as the former suggests individual training of doctors. TCM tutoring features “one master, one apprentice” in which a learner works with an educator in all medical practices to master the required skills. However, many TCM masters realized that this mode would not be appropriate in the digital age. In order to better promote TCM among Chinese citizens, the school released all its materials under the Creative Commons licenses and made them available to the public. At the same time, it started a “one master, ten apprentices” hatch mode training in 2006. A TCM master may provide his experiences to ten apprentices who will share these open resources to a hundred of learners. The school management expects the new mode and open resources may yield more TCM professionals and enhance the system of the public health protection.

The Kong Bohua TCM School has been devoted to the sharing of open educational resources in Traditional Chinese Medicine for long. It has co-organized a *Forum on Cultural Promotion of Traditional*



Fig. 4.13. Course Page of Kong Bohua TCM School Website (<http://www.kongbohua.com.cn/xuetang/kechengjieshao.php>).

The SLL Wiki provides a number of high-quality manuals, tutorials and courses for Web 2.0 usage in education. There are also introductions of new media in education applications, case studies of online education, and theoretical analysis on the educational strategies. It also addresses a reform in classroom teaching.

4.15 Educational Resources in the Public Domain

As provided by *the Copyright Law of the People's Republic of China*, the right to publish, the right to exploit and the right to remuneration are subject to certain durations. In respect of a work created by an individual, it is the life time of the author and fifty years after his death, expiring on December 31 of the fiftieth year after his death. In the case of a work of joint authorship, such term shall expire on December 31 of the fiftieth year after the death of the last surviving author. The term of protection for the right of publication, the right of exploitation and the right to remuneration in respect of a work where the copyright belongs to a legal person or entity without legal personality, or in respect of a work created in the course of employment where the legal person or entity without legal personality enjoys the copyright (except the right of authorship), shall be fifty years, expiring on December 31 of the fiftieth year after the first publication of such work. However, any work that has not been published within fifty years after its completion shall no longer be protected under the Copyright Law.

There are also materials that are not protected by the Copyright Law. Article 5 of *the Copyright Law of the People's Republic of China* states that the law is inapplicable to:

- 1) laws; regulations; resolutions, decisions and orders of state authorities; other documents of legislative, administrative and judicial nature; and their official translations;
- 2) news on current affairs; and
- 3) calendars, numerical tables, forms of general use and formulas.

China is one of the countries with the longest histories in the world. The people of all of China's nationalities have jointly created a culture of grandeur. For thousands of years, numerous books have been published in various forms. Now all these ancient documents are available in the public domain. However, many of the materials are available only in a small amount of copies, and the

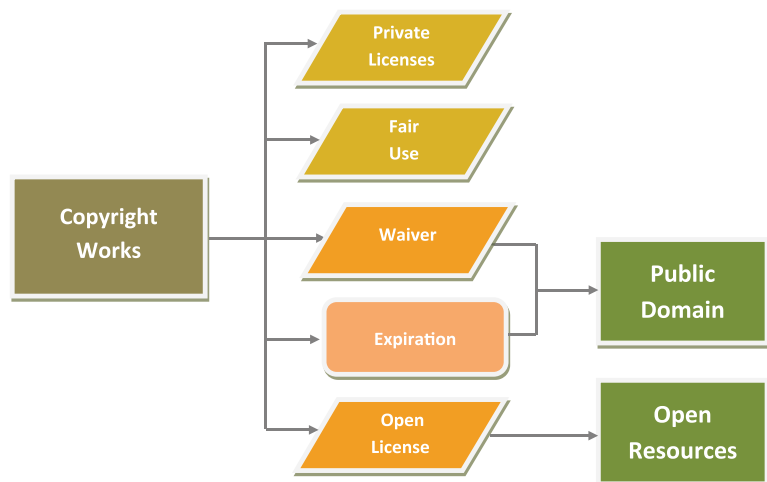


Fig. 4.15.1. Resources in the public domain as per the Copyright Law of P.R. China.

paper books with such materials are expensive and difficult to access. Intellectuals and educated people have a lot of motives to learn from ancient documents. With the development of Internet technology, more and more institutes, non-profit organizations and commercial enterprises work on the digitization of Chinese ancient works and documents and make them available through the Internet.

Digitization of ancient documents commenced in the early 1980s. However, its pace has never been so rapid as at the beginning of this century. Initially, only bibliographies were digitized, but now entire books are digitized, which makes navigation easier and transmission faster. Now, numerous universities and institutions are working diligently on digitization of ancient documents, opening databases and e-document repositories for the use of general public. For example, the Chinese Academy of Social Science provided navigation system for Poems of the Whole Tang Dynasty, Articles of the Whole Tang Dynasty, The Thirteen Classics and Poems of the Whole Song Dynasty, etc. Peking University designed a database for Poems of the Whole Tang Dynasty and Poems of the Whole Song Dynasty. Henan University compiled a library of Major Historical Literature for Southern Song Dynasty.

Libraries also digitize ancient documents from their collections and present them to the public. For example, the National Library of China presents databases of masterpieces of Stone Rubbings and Dunhuang Treasury, and the Shanghai Library created such databases as Classical Editions for Ancient documents and opened them for readers.

Commercial companies are also working on such projects to provide free resources for the public. A very important enterprise engaged in the process of digitization and promotion of ancient Chinese books should be mentioned: it is Beijing Guoxue Times Culture Co., Ltd. (Guoxue in Chinese refers to the

studies of ancient Chinese civilization.) Guoxue.com, the website founded in 2000 and hosted by the company, is considered as the home of many classical Chinese literary works. The number of registered members of the website has reached 20,000. All the most famous ancient Chinese books are available on the website, and they are free to browse and download.

The leading Chinese company in search engine business, Baidu.com (<http://guoxue.baidu.com/>), cooperated with Guexue.com to provide a Baidu Guoxue website for digitized ancient documents. Currently more than 100 classical works are available, well arranged and freely sharable.



Fig. 4.15.2. Homepage of Guoxue.com (<http://www.guoxue.com>)



5. Future Challenges for
OER in China

5.1 Financial Support

There are no foundations similar to the William and Flora Hewlett Foundation in China that can provide financial aids for OER projects. Most of the OER projects are maintained voluntarily by teachers in Chinese higher education institutions. Lack of sustainable financial mechanism for OER in China is a significant obstacle hindering the development of OER in China.

Although CQC can provide financial aids for teachers, only a small part of teachers are awarded the support. Many young teachers who really accept the idea of OER and possess necessary ICT skills lack financial support for their open course websites, which discourages them from developing OER.

Recently, some foundations are focused their efforts on primary and middle school education. There are some foreign foundations which provide financial support for universities in China, such as the Ford Foundation. However, the support is mostly allocated for scientific research rather than OER projects.

Some scholars argue that, as a public interest production, OER should be supported by the government: upholding the principles of non-exclusiveness and non-competitiveness, OER is designed for free use and better promotion, distribution and application of knowledge. In this sense, it is a public welfare undertaking and therefore should be funded by the government (Wang Long, 2006). There are also researchers who suggest that commercial enterprises could be potential sponsors for OER in the future (Cui Miao, 2009). The OER initiatives may call for bids from enterprises which are ready to invest in brand-building or advertising.

5.2 Network Access

Nowadays, most of the Open Educational Resources produced by the Chinese higher education institutes are available via the China Education and Research Network (CERNET)³, which is the first and the largest national academic Internet backbone and currently the second largest network backbone in China. CERNET is supported by the Chinese government and directly managed by the Ministry of Education. Its network infrastructure mainly serves universities, institutes, colleges and schools all over China. The end users are professors, researchers and students.

Although CERNET was managed by the Chinese Ministry of Education, however, users still have to pay a considerable amount of money for Internet connection, which is a heavy burden for many Chinese universities and colleges. Particularly, the Internet connection in CERNET is divided into the so-called “domestic online ” and “international online”, the fee of the former is fixed⁴ for staff and students, while the fee for the latter depends on the volume of data flow when visiting foreign websites. “International

3 CERNET was founded in 1994. It provides services for universities, institutes, schools and other non-profit organizations in China, including network connection, .edu.cn domain name and IP address assignment, and educational and research resources and super computing services. Now, there are about 3,000 universities in China.

4 In general, the fixed Internet Connect Fee varies, usually the traffic fee is about 10-50 RMB per month.

Visit Fee" is about 1 Yuan per Mb. Furthermore, teachers and students have to pay not only for browsing foreign websites but also for the visits of users from abroad to their own websites. That is to say, if you have a website in CERNET and it is visited by foreign users through Internet, you have to pay for such visits according to the volume of data flow produced by foreign users.

The so-called International Visit Fee blocks the OER development in Chinese higher education institutes, because if the Chinese Quality Courses, usually located on the campus servers, add the function of International visit, teachers would have to pay for any visit from abroad. Otherwise, the CQC website is available for domestic users only and that is why it may not be considered as real "open educational resources". This regulation is a serious problem in the OER development in China.

5.3 Public Awareness & Promotion

Although OER has already drawn attention of researchers, librarians and the government, it is still not widely recognized among educators and students. A survey shows that a number of CQC contributors think that their courses are merely offered for a governmental project for the purpose of education evaluation rather than for the purpose of open education (Cui Niao, 2009).

Unfortunately, many students who have already used CQC courses are not aware of the sharing spirit behind the open courses and have vague ideas about OER. They simply use a CQC courseware as an additional source for their studies without the intentions of re-using or improving the materials. Graduates and under-educated population still depend on paid online or printed materials for further studies. They also have little knowledge about OER. They are still lacking the awareness for making the full use of OER.

The reason is not only that the idea of OER is not yet popular, but also the fact that the idea of open access and sharing is not popular. In this sense, the government's advocates and media promotions are equally important.

The government can play an important role in promoting OER by emphasizing the advantages of using OER and promoting the infrastructure and approaches for access to OER. The following strategy of promotion can be considered: for registered students of universities who are very interested in higher education overseas, it is a good idea to start with Yale and MIT Open Courseware; while for those who cannot study at universities, it is important to focus on introducing the CQC project based on current school programmes.

More attention should be devoted to self-learners who are currently beyond the educational system. It is necessary to provide them with information and practical approaches to access existing resources, as well as the idea of openness and sharing. Thanks to measures of promotion of OER, they would know that apart from enrolling to a university, they could enjoy higher education by using OER. At the same time, the government should also build an infrastructure for this disadvantaged group, especially for

rural area residents. For those who do not have Internet connection, the government could provide computers or other devices for access to OER. Another approach is to integrate OER learning into the higher education system to allow self-learners to acquire credits from certain OER courses.

5.4 Increased Interaction between Teachers and Students

Interactive communication between educators/resource creators and the learners is an advantage of OER comparing to regular educational resources. This enables creators to understand the real needs of users and to change the traditional mode of educational resources: unidirectional giving and passive accepting.

To understand the needs of users, first of all, the creators should make a survey before developing their resources. For instance, a survey has already shown that around 70% of CQC users gave preference to resources in the text format. Therefore, the creators may investigate on whether users are most likely to prefer text, video or audio form, or other format, before they design and create resources. On the other hand, after these resources are available online, users should be able to formulate their demand, provide feedbacks and comments through a promoting platform. Cui Niao (2009) developed a two-way model for the interactions.

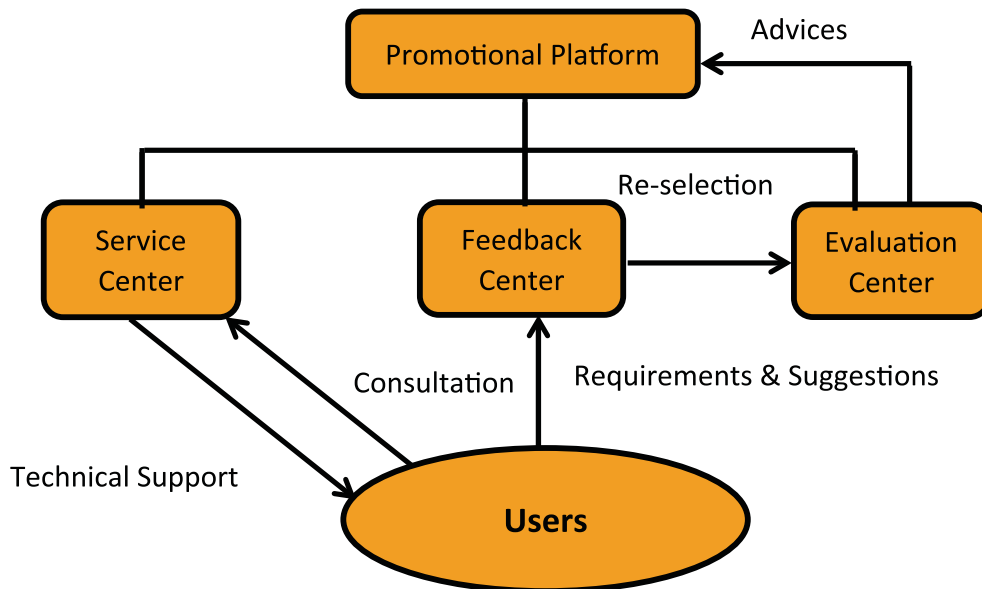


Fig. 5.4. The model of two-way communication on promoting platform

This model suggests that the promoting platform should establish its own service centre, feedback centre and evaluation centre. If a user faces any problems while using OER resources in the platform, he can immediately ask the service centre for help. If the problems cannot be resolved by service

centre, users should be able to contact a feedback centre, which should collect claims, suggestions and feedback requests and submit them to the evaluation centre. The latter will evaluate the information to find out solutions to improve the platform. The model is user-oriented and provides an approach to sustainable development of OER.

5.5 Adopting Web 3.0 Technologies

A clear definition of the term “Web 3.0” is yet unavailable; nevertheless it is widely accepted that Web 3.0 is about personalization, semantic web and artificial intelligence (Zhang Decheng and Wang Zhiqing, 2008). Various researchers expressed their expectation on Web 3.0 for resolving certain problems of Chinese OER development.

Considering the advantages of this new technology, the problems listed below and connected to OER in China could hopefully be resolved by Web 3.0:

- 1) No applications or platforms integrating the OER resources: there is a number of search engines running smoothly with OER searching, however, the resources usually reside at independent platforms which focus on one specific domain or purpose. Such resources are not integrated as a whole with others, hence the inefficiency in searching and using the resources.
- 2) Lack of personalization and interaction: most OER resources comprise several columns including objectives, teaching plan, ppt slides and online communications. These columns, as well as interfaces and platforms are quite similar. Also, in most cases, only the author may edit posted resources, and users can seldom participate in the improvement of resources.

Therefore, OER creators are expected to use Web 3.0 tools for personalization of interfaces and integration of resources, as Web 3.0 could connect the information with users' actual needs and efficiently provide Internet service based on personal experience. Taking a search engine as an example, the traditional keywords searching, always presenting some repeated results, directs users to irrelevant resources. The reason is that the generation and distribution of resources are completely unidentifiable. However, with semantic method, Web 3.0 search engine could identify the actual needs of a certain user and filter irrelevant results. In every data package with Web 3.0 system there is a source, time and liability of the information, all identifiable by users' own systems. Providing more accurately the resources in need, Web 3.0 system may increase learning efficiency. The inter-platform communication feature of Web 3.0 could integrate resources residing at different platforms. As resources of all websites, platforms and softwares for OER being automatically categorized by one standard, users may enjoy a universal platform for OER and can browse through all relevant information under a specific subject easily (Tao Chunming, Huang Zhaobi, 2008). Web 3.0 also features personalization of resources. Providing useful tools, it encourages users to develop their personalized resources, to integrate their own knowledge and data, and makes these resources available through various platforms. These features are especially helpful to solve the problems in OER initiatives in China.

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