Expanding Access to Learning

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EXPANDING ACCESS TO LEARNING

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ABSTRACT

EXPANDING ACCESS TO LEARNING

Universities by tradition are established to teach, conduct research, and provide services to communities. With the computer and modem, the classrooms and ivy-covered walls of today's colleges are becoming artifacts of education "as it used to be". What we call "non-traditional" today because they are delivered through various distance learning technologies (computer, videotape, correspondence etc.) will become the preferred delivery system for education in the 21st century. Especially in developing countries, open universities are playing a more important role than tradition ones to make higher education available to more people--especially adults--principally through a system of open access and distance education.

Launched in 1981, the Self-Taught Higher Education Examinations Program (SHEE) is a component of the higher education system of China. SHEE, run by the National Education Examinations Authority (NEEA), provides an alternative way to obtain diplomas for people who cannot access the general universities and colleges. It is a form of higher education combining independent study, social assistance, and state examinations. It has been claimed as the world's largest self-study higher education system with 56 of every 10,000 people in the country having attended self-study examinations for the equivalent of a college diploma. All the citizens of the People's Republic of China (PRC), regardless of sex, age, ethnic group, race, or level of education, can take the examinations. Basically, SHEE is not only an examination system but also a type of open university or distance education system. One of its
apparent weaknesses is that there is not a campus with the education. The examinees or the students lack enough guidance in their learning process. It is hard for them either to find partners to communicate or facilities such as libraries and labs to utilize. Under these circumstances, the promotion of learning assistance has become the focus of the system.

The International Council for Open and Distance Education (ICDE) is the global membership organization of educational institutions, national and regional associations, corporations, educational authorities and agencies in the fields of open learning, distance education, and flexible, life-long learning. Founded in 1938, the mission of the ICDE is to help provide education for students and children living far away from schools. The International Council for Open and Distance Education (ICDE) has become over the years the global membership organization in the field and is now (in 2002) present in 142 countries. The majority of its membership is composed of educational institutions at all levels (schools, colleges, universities), but it also includes national and regional associations, corporations, educational authorities and agencies, active in open, virtual and distance learning.

Universitat Oberta de Catalunya (UOC) (Catalonia, Spain) is a virtual university with a global and pioneering focus. UOC offers intensive use of information and communications technologies (ICT). This enables it to overcome barriers imposed by time and space and to offer model of education based on personalized attention for each student. At the UOC, students, professors, and administrators interact and cooperate on the Virtual Campus, making a university community which uses the Internet to create, structure, share, and disseminate knowledge.
Since 2001, ICDE, UOC, and NEEA have worked on a project entitled “Developing EU-China e-Learning Model and Capacities,” which has been financially aided by the Council of Europe. The purpose of the project is to promote the e-learning in China by introducing the leading technology and experience in distance education and e-learning of European countries. The project consists of three phases: (1) a study comparing and contrasting the distance education systems and current situations in China and EU, (2) development of a model for virtual education in China, where three questions regarding three aspects are answered: content, teaching methodology, and delivery technology, (3) the development and testing of a platform.

The current paper will track and summarize the research activities conducted during the project and explore the education theory and models involved in the project. The advantages and disadvantages, feasibilities and difficulties of e-learning will be discussed as well.
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CHAPTER 1
DISTANCE EDUCATION AND E-LEARNING

1.1 The Concept of Distance Education

Distance education or distance learning, which is exchangeable in most situations, is a system of education in which education is provided to students from a distance. It is a learning process that normally occurs in a different place from teaching, and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements. It is an instructional delivery that does not limit the student to be physically present in the same location as the instructor.

Quite a few terms and definitions have been used to describe this type of education, and its basic characteristics include:

(1) The teachers and the students have to be separated by physical distance, which distinguishes it from traditional education. For traditional models, the most important way to teach and learn is a two-way communication between the teacher and students by oral and body language, and this has long been proven to be the most effective way. The appearance of distance education, in the author’s guess, was due to the shortage of teachers. Distance education had to find alternative means of communication besides face to face interactions.

(2) The utilizing of delivery technology plays an important role in its successfulness. In the early stage, hard copies delivered through the mail was the primary medium to distribute the teaching materials and collect the works of students.
Radio and television developed after that. Along with the coming of the information era, computer technology has been dominating the stage. Nowadays, the Internet is providing every possibility that could not be imagined even with the wildest mind several decades ago.

(3) The students usually study individually rather than in groups, except for the possibility of occasional meetings. Peer teaching compliments guidance and instruction from the teacher in traditional education. The students themselves in distance education usually have to work independently throughout the length of the learning process (Keegan, 1990).

(4) The educational institutions maintain significant influences both in the planning and preparation of learning materials. The students are not completely study-at-home or teach-yourself. They have to make appropriate progress according to the pace established by the educational institutions. They must also fulfill the assessment requirements in order to obtain some sort of recognition.

Among these characteristics, two basic elements are most important to distinguish distance education from others: (1) the physical separation of instructor and learner, and (2) the changed role of the teacher, who meets students only for some special cases (e.g. answering students’ questions or providing special tutorials).

Distance education has both advantages and disadvantages over traditional education. On one hand, it can be cost effective, since it can bring more educational opportunities to more people. On the other hand, it can be cost expensive, since it involves extensive use of technologies and equipment. Nevertheless, since it has evolved to bring learning opportunities to students in places where education was
unavailable for geographical, economic, or social reasons, distance education is not just popular in the developed countries, but also plays an important role in the developing counties.

Since the 1990’s, a lot of developing countries have been turning to various state run or private owned distance education programs to take the place of ever increasing enrollments and to help with a lack of physical building space. China, for example, is moving from “elite to mass education,” and “traditional universities cannot meet the demand”. As a result, China uses a radio and television delivery system to serve 1.5 million students, two-thirds of which are in a degree program (Zhao, 1993). India, another major developing country, has set up a number of open universities since the 1980’s. Begun in 1992, The Program of Action has a very ambitious target for enrollment in the distance system. It says: “During the Eighth Plan period, the enrollment in the Open university/Distance Education System is expected to increase from about 11.5 percent of the total enrollment in higher education to about 16.5 percent. In absolute terms, this would involve a net addition of 4,000,000 students to the enrolment in the Open University/ distance education system by the end of the Eighth Plan.” (Manjulika and Venugopal, 1996, page 23)

In the 20\textsuperscript{th} century, the gradually accelerating pace of technological invention led to many new forms of distance education. Our understanding of distance learning has been developing following the development of technologies.

Distance learning was originally known as correspondence study and started in Europe. In the early 1900s, some institutions and universities provided correspondence courses to people who wanted to learn but could not attend the universities in a
traditional way. These universities mailed the learning materials to their students through the postal system. For example, the University of London offered correspondence courses to its remote colonies via the postal system. At the same time, many education agencies and institutions focused on some issues, such as the necessity of new pedagogical models and new nation-level guidelines, university policies regarding acceptance of credit from correspondence courses, credit transfer, and the standards of quality for correspondence educators. These studies and their implementation accelerated the spread of correspondence study widely.

Although the mail has played a dominant role in delivering learning materials to remote learners for almost forty years, the invention of radio and TV enhanced the development of distance learning. In the middle of the 20th century, as radios and televisions were more available to many people, instructional radio and television became popular. Educational institutes broadcasted their courses to learners in far away regions. By 1923, more than ten percent of all broadcast radio stations were owned by educational institutions which delivered educational programming in the US. The Open University of UK was established in 1969, combining distance learning programs using print and non-print resources (Holmberg, 1986).

Since the 1990’s, emerging technologies for information exchange have brought an exciting development to distance education. Through the use of computers, telecommunications, and multimedia devices, computer-mediated communication has emerged as an alternative mode of educational delivery. This is called e-learning.
1.2 The Concept of E-learning

E-learning does not occur in distance education only. Today it has been utilized by many students. However, e-learning is closely connected with distance learning, since it is able to get over most of the shortcomings that distance education used to suffer. In e-learning, teachers give their lectures by communicating with students through the use of the computer network or the internet. The explosive growth of the internet has contributed to the increasing popularity of this type of education. According to a US Department of Education study (ED Study, 1997), about 95 percent of higher education institutions with enrollment of ten thousand or more will be offering some form of e-learning to its regular students, and 76 percent of them were offering distance education programs off-campus.

E-learning refers to the combination of information technology and education. It is teaching and learning based on technology. E-learning can be CD ROM-based, network-based, intranet-based, or internet-based. It can include text, video, audio, animation, and virtual environments. It can be a very rich learning experience that can even surpass the level of training you might experience in a crowded classroom. As Obringer said, “E-learning is to classroom learning as cell phones are to a pay phone at the bus station.” (http://www.howstuffworks.com/elearning1.htm)

Network and associated technologies are utilized to create, deliver, and facilitate the learning activities. Theoretically, it delivers individualized, comprehensive, and dynamic learning content in real time. This aids the development of communities of knowledge, linking learners and teachers. It delivers accountability, accessibility, and opportunity to allow people and organizations to keep up with the rapid changes that
define today’s world. It is a force that gives people and organizations the competitive edge to allow them to keep ahead of the rapidly changing global economy.

However, the quality of the electronic-based learning, as in every form of learning, is in its content and its delivery. E-learning can suffer from many of the same pitfalls as classroom training, such as boring slides, monotonous speech, and little opportunity for interaction. The beauty of e-learning is that new software allows the creation of very effective learning environments.

There are difference levels of e-learning. We can categorize the process into the following classes according to their characteristics:

(1) Knowledge databases. Perhaps many people will argue that this is not actual training, but the author still thinks it is the most basic form of e-learning. Today it is the most widely used form of e-learning. We can find numerous knowledge databases in libraries or sites on the Internet. These are usually moderately interactive, meaning that you can either type in a key word or phrase to search the database, or make a selection from an alphabetical list. However, usually this type of learning does not involve any teaching. It is used to provide some complimentary information and for query purposes, but it is seldom used as a type of teaching.

(2) Online communication. The students and teachers do not have to meet physically in order to exchange information. The internet and telecommunication have provided lots of means for people to communicate. Today, through the Internet, people can use forums, chat rooms, online bulletin boards, e-mail, or live instant messaging and a lot of other methods to connect people in different places. Online support is also a form of e-learning and functions in a similar manner as knowledge databases. This type
of e-learning is slightly more interactive than knowledge databases, and online support offers the opportunity for more specific questions and answers, as well as more immediate answers.

(3) Asynchronous learning. This is e-learning in the more traditional sense of the word. It involves self-paced learning, either CD-ROM-based, network-based, intranet-based, or internet-based. It may include access to instructors through online bulletin boards, online discussion groups, and e-mail. It may be totally self-contained with links to reference materials in place of a live instructor.

(4) Synchronous learning. Synchronous learning is carried out in real-time with a live instructor facilitating the training. This learning activity has to be set in a fixed time. Everyone taking part in can communicate directly with the instructor and with each other. You can raise your cyber hand and even view the cyber whiteboard. It lasts for a set amount of time -- from a single session to several weeks, months or even years. This type of training usually takes place via internet web sites, audio- or video-conferencing, conference call, or even two-way live broadcasts to students in a classroom.

E-learning has a lot of benefits over traditional classroom training, if it is conducted and utilized properly. One obvious benefit is flexibility. The students do not have to travel or live together. Therefore, it is especially ideal for distance education. In addition to its flexibility, e-learning has the following advantages:

(1) It can be updated easily and quickly. Online e-learning sessions are especially easy to keep up-to-date because the updated materials can be simply uploaded
to a server. CD-ROM-based programs may be slightly more expensive to update and distribute, but can still be cheaper than reprinting manuals and retraining instructors.

(2) It provides a consistent message. E-learning eliminates the problems associated with different instructors teaching slightly different material on the same subject.

(3) It can lead to increased retention and a stronger grasp on the subject. This is because of the many elements are combined in e-learning to reinforce the message, such as video, audio, quizzes, interaction, etc. There is also the ability to revisit or replay sections of the training that might not have been clear the first time around.

(4) It can be easily managed for large groups of students. In well-designed management system, the administrators are allowed to keep track of the course offerings and schedule or assign training. They can review a student's scores and identify any areas that need additional training.

(5) It is self-paced. The individualized learning process allows learners to skip material they already know and understand and move onto the issues they need training on.

Nonetheless, talking about the advantages of e-learning does not guarantee the success of e-learning. One common mistake people keep making is to pay too much attention to the “e-” part instead of the learning. Actually, “e-” is the easiest part of the education. E-learning has become a huge market and a lot of companies have crowded in to sell all kinds of fancy equipment, devices, or services. To make e-learning successful, we should pay more attention to “education”. One organization or training institution must identify a specific need to start an e-learning initiative. They should
focus on the solution rather than a particular technology. Of course, it is also very important to choose the correct technology, since one of the most obvious attributes of distance education is its emphasis on the use of technology to accomplish its goals. It can be seen as "a set of instructional methods based on largely on mediated communication capable of extending the influence of education beyond the formal institutional setting for the purpose of benefiting of the learner through appropriate guidance and support." (Garrison, 1990) Without the use of technology, distance education would not exist.

1.3 Everlasting Challenge of Distance Education: Construction of Learning Community

Compared with traditional education, both the advantages and disadvantages of distance education are apparent. On the one hand, distance education extends the reach of education to those who cannot come to campus, making education more affordable, providing new models for lifelong learning, and reforming teaching practice through the emphasis on learner centered activities and elimination of the lecture as the central teaching activity. On the other hand, many people argue that distance education is lowering the quality of instruction, a moneymaking rather than education enterprise, an environment where cheating can not be controlled, and an environment that threatens the teaching role through the lack of any physical limit on class size.

Among the criticisms, perhaps the most important one is that distance education lacks interactive activities. In real life, people accept education not only from books. Instead, students gain knowledge and skills by asking questions and answering questions. These interactive activities not only occur between the students and the
teachers, but also occur among the students themselves. Furthermore, students learn not only from the teaching and learning process itself, but also from everything happening in everyday. Based on an analysis of the contemporary usage of the term community in an educational context, Barab and Duffy (2000) point out that three key components have to be noticed during building a learning community: a common cultural and historical heritage, inclusion in an interdependent system, and the ability to reproduce. This is a challenging task even when students live on one campus, never mind in distance education institutions where the students are separated physically. Building learning communities is a theme that emerges throughout the theory and practice of distance education.
2.1 General Introduction

Distance education has been promoted mainly for higher education in China. There are three primary establishments in China which are involved in distance education: continuing education departments in regular universities and colleges, television and radio universities, and the national higher education diploma examination system. The continuing education departments in regular universities and colleges are organized and administrated in a very similar way to those in the United States. However, the television and radio universities and the national higher education diploma examination system are unique systems with Chinese characteristics, and they are two dominate forces in implementing distance education.

Chinese distance education started in the 1950's after the People’s Republic of China came into being. At that time, printed teaching materials and the radio were the main media used to deliver instruction. After the 1980’s, radio and television universities were widespread in the country, and the network of satellite education took shape. Radio and television universities were the first distance education institutions to use electronic communication technology. Their main tasks are to offer degree programs and supply programs for vocational and technical education, in-service training, vocational training, and continuing education. The radio and television education system consists of the Central Radio and Television University which is directed by the ministry of education, one provincial radio and television university for each province,
more than 800 municipal-level branches, and about 2000 county-level branches. The degree programs provided by each university have to be monitored and approved by the Central University. Popular degree programs include literature, economics, politics, law, science, engineering, medicine, agriculture, art, physical education, and teacher training.

According to the 2001 statistics, the total number of graduates of three-year radio and television colleges reached more than 2 million and the total current enrollment in 2001 reached over 700,000. The total number of graduates of specialized secondary schools reached over 1,000,000 and the total enrollment reached over 400,000. The total number of all kinds of non-degree educational graduates has reached over 30 million. Besides, a lot of practical-skill training has been offered to millions of farmers.

The Action Scheme for Invigorating Education towards the 21st Century issued by the State Council in 1999 regarded modern distance education as one of the key projects. The target of the project is to initially set up the modern distance education network, to construct a series of backbone courses, and to search for a teaching and administration pattern suitable for China's modern distance education through three years of efforts. The network with complete structures will be formed by 2010 to meet the need of education, and a life-long education system will be set up. Based on the educational science and research and making use of the country's telecommunication net and cable television net, the professional platform has formed through upgrading and conforming. The main tasks are to develop continuing education, provide teaching resources for school's teaching and students' self-learning, improve teaching in poor

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i The statistics can be found from [http://www.moe.gov.cn/](http://www.moe.gov.cn/)
regions, make higher education accessible to more people, and raise the literary level of the public. The *Decision on Strengthening Educational Reform and Boosting Education of Overall Qualification*, which was promulgated by the State Council, points out that the government supports the construction of modern distance education based on the Chinese educational science and research net and satellite education system. It also strengthens the construction of practical terminal platform system and campus net or regional net, provides opportunities of life-long education for the public with modern distance education, and provides education suitable for the necessity of rural and outlying districts. In order to search for the proper modern distance education patterns and to further improve the modern distance education system, Tsinghua University, Beijing Post and Telecommunication University, Zhejiang University, and Hunan University were designated as the key experimental universities and the relevant experiments are being carried out at present.

### 2.2 Self-Taught Higher Education Examination System

Set up in 1981, the Self-taught Higher Education Examination system (SHEE) is a national exam system for self-taught learners and was considered as one important component of higher education system in China.

China is the biggest developing country in the world. The total population is 1.3 billion and has about 25 million at each age. At each age only 4% of them could go to universities and colleges in 1980's. That rate is pretty low even in developing countries. In addition, the so-called Cultural Revolution (1966-1976) terminated formal higher education for a decade and made most of the young people not able to study in

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Further information can be found in [http://www.moe.gov.cn/](http://www.moe.gov.cn/)

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\(^{ii}\) Further information can be found in [http://www.moe.gov.cn/]
universities. SHEE was set up based on that background. The system provides an opportunity for those people who cannot enter universities to get a higher education diploma by self-taught learning and attending the national examination. The three most important characteristics distinguishing SHEE from other types of education are self-taught learning, community assistance, and the national exam. The focus of the system is the nation-wide examination, but the purpose of the system is not only examination but education.

The National Education Examination Authority (NEEA) was set up in 1983 to oversee the administration of the SHEE. In March 1988, the State Council circulated the Provisional Regulations on a Higher Education Examination Program for the Self-taught. (Chinagate, 2005) The general requirements of the examination basically coincide with those of regular and junior college courses. Colleges and universities in charge of examinations work out examination plans of special courses which are in line with the overall teaching plans for universities. Those who pass the examination in their chosen subject receive diplomas of junior or regular college education and enjoy similar treatment to graduates from colleges and universities. According to statistics in 2003, more than 12 million people registered for the examination, with 670,300 receiving the diplomas. Of these, 212,000 got regular college certificates, and the rest acquired that of a junior college education.

In recent years, China’s economy has boomed and higher education also has enjoyed a rapid development. Now, the higher education enrollment rate has risen 10%

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iii The web site of NEEA is http://www.neea.edu.cn/

iv
in general and more than 50% in cities and developed regions. (NEEA, 2004) The focus of the SHEE has changed from people who are not able to attend regular universities to those who seek job training and lifelong learning. A lot of non-degree courses and vocational training has been provided. At the same time, NEEA and its local offices have cooperated with some universities to promote online and distance degree education.

2.3 E-Learning in China

The history of distance education in China can be categorized into three phases: (1) postal education: knowledge transmission was carried out mainly by mailing of printed materials; (2) broadcasting education: Knowledge was first transformed into analogue information and then was broadcasted by radio and television; and (3) digital education: with the application of computer network and multimedia technology, knowledge is now transmitted interactively in a digitalized environment.

The Chinese government has always attached great importance to e-learning. In 1993, the China Education and Research Network (CERNET) was started. In 1999, the State Council approved the *Education Vitalization Plan for the 21st Century*, which was submitted by the Ministry of Education. In the last decade, e-learning has achieved great progress. Besides CERNET, the China Education Satellite Broadband Transmission Network (CEBsat) has been another major system built. Presently, CERNET has a nationwide optical fiber net that covers more than 200 cities. The transmission rate of its main line is 2.5G bps and that of the local lines is 155M bps. CERNET has connected

\[iv\] The statistics can be found in [http://www.moe.gov.cn/](http://www.moe.gov.cn/)
over 5,000 universities, high schools, primary schools, and research institutions. CERNET has been devoting to provide e-learning platforms and course related educational resources exploitation for education institutions.

Most of the e-learning applications which will be discussed in this paper are based on CERNET. However, in most non-urban locations, bandwidth limitations still make it hard the use of the more sophisticated knowledge. As a result of the relative speeds of development, for some applications, CD-ROMS are used as a back-up to overcome these limitations. In addition, although satellite communication is more expensive than the Internet, China has found it necessary to use it to overcome problems of remoteness.

Further information about CERNET can be found in http://www.edu.cn/
CHAPTER 3

SUCESSFUL CASES

3.1 Open University of Catalonia

The Open University of Catalonia (UOC) is one of the partners of NEEA on the EU-China E-learning project. It is a pioneer of e-learning and has been recognized as the most successful model on promoting e-learning.

Founded in October 1995, UOC is an innovative web-centric virtual organization in Spain, which from the very beginning has relied on the intensive use of information and communication technologies. Both for the delivering of its courses and for the conception and development of the learning materials – and also for its own management and internal operation - the UOC has succeeded in incorporating the latest advances in the use of information technologies in education. Unlike a number of virtual university projects, UOC did not develop out of the evolution of a traditional face-to-face university, but was designed from the outset as a wholly new virtual university teaching initiative.

UOC was promoted by the Catalan Government and has developed in partnership with key stakeholders in Catalonia from both the public and private sectors. It was designed to complement the traditional Catalan university system by making university studies available to all members of society who, because of work, place of residence, age or other personal factors, opt to enroll in more flexible learning.

6 The UOC Web site is http://www.uoc.edu/ – the pages are in Catalan but there is a comprehensive set of pages in English at http://www.uoc.edu/web/eng/index.html (and also pages in Spanish).
percent of UOC tutors are employed by other universities in Catalonia, and the university is generally well-regarded in the region (Bacsich, 2004).

According to the introduction on the website of the UOC, UOC offers over 800 courses. Course module credits can be transferred to construct final degrees, although credits are awarded only upon full completion of the course. There are official undergraduate degrees in Business Studies, Pedagogy, Psychology, Law, Humanities, Catalan Language and Literature, Management Studies, English Language and Literature, and Computer Engineering. The university also offers courses leading to postgraduate degrees, diplomas or certificates in the following: international and interdisciplinary PhDs on the information and knowledge society, master’s degrees, post-graduate studies, pre-university studies, and university extension courses.

UOC makes intensive use of the information and communication technologies. The university offers the full range of services provided by its Virtual Campus technology platform. In addition, UOC ensures students have access to a personal counselor. There is also a range of local support centers throughout the country. These centers have a media library with all the UOC’s multimedia and reference materials, as well as computers connected to the Virtual Campus for the student’s use. The support centers have meeting and study rooms that students can use upon prior reservation. Students are not charged for this service. There are 11 of these centers throughout the country.

The Virtual Campus is the principal communication space for teaching and communication, tutorials and students support, and all cultural, social and personal
communication. It provides access to all general services, and provides the same all-academic and non-academic services found on a traditional university campus.

In a stimulating atmosphere such as that of the Virtual Campus, members of the virtual community establish relationships that facilitate, encourage and guarantee easy access to knowledge as well as a full university life.

Research has been greatly emphasized at the UOC, and this is why the UOC has created a single institute entitled the IN3 (Internet Interdisciplinary Institute). IN3 is an interdisciplinary virtual research center, which focuses on the effects, uses, and applications of information and communication technologies in different aspects of knowledge and society.

The learning process was modularized and identified as having four critical components: (1) Lectures, which take place either as a video session delivered through a combination of the Internet and CD-ROM, (2) autonomous learning activities carefully designed from an instructional design standpoint, (3) collaborative learning activities, conducted mostly in an asynchronous mode using a variety of Internet tools, and (4) tutoring, which allows participants to interact with an expert and receive feedback and support in a timely fashion (UOC, 2004).

Figure 1 illustrates the educative model of the UOC. The students are the center of the learning process. In the virtual classroom, the student interacts continuously with both professors and other class members, experiencing the joy of learning and generating knowledge by sharing ideas and proposals and resolving doubts on course content, either individually or collectively. The course plan establishes a learning process and working methodology for each student, as well as planning the content and
the assessment criteria for each subject. Its aim is to orient and guide student's work throughout each semester. As a means for facilitating learning, the course plan is a basic tool for the correct development of the subject being studied.

The system of continuous assessment is outlined within the course plan for each subject. Throughout the semester, a series of activities have to be completed, and these are guided and assessed by the professors responsible for each subject. This system of evaluation ensures that students gain the maximum from their course and guarantees that they reach the objectives set for each subject. At the same time, it allows them to plot the continuous development of their learning process, evaluating and measuring progress on a daily basis.

Also, from the very start, students receive support from their counselor, who guides them through the complete process of enrollment, learning and being part of the UOC. The counselor offers academic advice on all matters related to the fulfillment of educational challenges, the process of integration within the university community, and professional orientation on completion of a student's studies. Throughout each semester at the UOC, the student's learning and progress in reaching individual objectives is supported by constant and personalized attention from the tutor of each subject. Within the context of the virtual campus, this tutor also assumes the role of a mentor.

At the start of each semester, UOC students are provided with all the materials required for each subject in which they are enrolled. Within the teaching material, students discover the concepts that will help them to obtain the knowledge, competence, and skills required by each discipline. These materials have been created by a professorial team composed of experts from diverse fields of knowledge and
educational methodology in accordance with the principles of the UOC's pedagogical model. The UOC, itself a product of pedagogical research, develops and experiments continually with new and innovative teaching materials which aim to improve the process of learning.

Face-to-face meetings are held every six months and this provide students with the opportunity to directly compare the focus of each program and their individual progress in a continuous evaluation, and to discuss this with their subject professors.

The Virtual Administration department enables students to deal efficiently, online, with any academic or administrative inquiries related to the UOC. Their responsibilities may include issues such as consultation of the student's academic record and official recognition of previous studies, requests for enrolment, or resolve problems with accessing any of the complementary, non-academic services offered to students. Local or regional centers, situated throughout Catalonia, Spain, and Europe, serve as nuclei for local or regional relations, and they help to promote the student's integration within the virtual learning model, offering personalized attention, study resources, and a space for meeting classmates.

The library plays a very important role in any university. The UOC's virtual library operates on two levels. First, it provides global access for students to all the information resources necessary to achieve their objectives: electronic publications, full text databases, subject-related news bulletins, and access to documents and resources, both from the UOC and from other information centers. On another level, the library offers personalized services adapted to the information needs of each student. Thus, within the virtual classroom, in the Resources space, students can find all those
materials, selected by professors and by the Library, which are indispensable for achieving the learning objectives of each subject as well as a fuller exploration of the subject matter. The UOC library focuses its attention on materials related to the Information and Knowledge Society.

The theoretical foundation of the UOC learning model is collaborative learning which, according to Pinheiro (1998), is “the process of students working in teams to pursue knowledge and learning” (P. 118). In this definition, learning is no longer viewed as a single direction transmission of knowledge from a teacher to a student, but a process of knowledge construction in which each participant contributes to and benefits from the ideas shared by the group. The UOC learning model adopted problem based learning as a pedagogical strategy. Students work on problems through free inquiry and a social process of knowledge construction. In these learning activities the tutor is a facilitator rather than an instructor.

The construction of a learning community was the focus of the Virtual Campus in the UOC. According to Garrison, Anderson, and Archer (2000), a worthwhile educational experience is embedded with in a community of inquiry that is composed of teachers and students. Learning occurs in this community as a result of the interaction of “three essential elements: cognitive presence, social presence, and teaching presence.” This notion is very important. From the perspective of a learning community, online education goes beyond earlier conceptions of computer-based learning as individualized behaviorist transmission of knowledge and becomes a learning experience potentially as rich as traditional face to face education. Moreover, the community perspective provides a larger context for collaborative learning. Instead of designing isolated learning
activities, faculty and instructional designers may attempt to create a learning community where students and faculty can collaborate to socially construct significant knowledge.

Since UOC is not a standard university, it is important to consider the particular nature of its student community. According to the report provided by the UOC (UOC, 2004). Most UOC students are between 25 and 40 years old, most of them work, and 4 out of 10 have children. There are a total of 16,000 students. About 12,500 are undergraduates and nearly 3,500 are participating in continuing studies. The UOC has more than 600 part-time faculty members. Generally speaking, these individuals retain existing jobs in other universities and companies and are contracted to work on specific courses.

Originally, the aim of the UOC was to use the latest information technologies to provide distance learning to Catalan students only in Catalonia. However, due to its success in Catalonia and the impact of new technologies on education as a whole, UOC decided in September 2000 to widen its scope to include students in the rest of Spain and in other Spanish-speaking countries. Four-thousand students from these new groups are now studying with the university.

UOC has been recognized worldwide. In 1997, the European Union awarded the university the Bangemann Challenge Prize for the best initiative in the Higher Education sector in Europe. In 2000, it received the WITSA Award in Taipei, a prize with high significance in the corporate world. This year, the International Council of Distance Education (ICDE) has awarded the university the Prize to Excellence as a
world leading virtual university and has recognized the university’s rector, Dr Gabriel Ferraté, for this contribution to the field during the last five years.

3.2 University of São Paulo

Brazil is a developing country and has the sixth largest population in the world. Brazil, in some way, is comparable in many ways with China. The “School of the Future” of the University of Saô Paulo (USP) is a very good case of virtual university for Chinese peers to study.

The SOF is a virtual education organization. Its strategic plan is to focus on providing open, interactive, and flexible continuing training through the use of new technologies for people who do not live on the university campus.

SOF offers the following courses: degree in Social and Humanities Sciences, degree in Education, degree in Occupational Therapy, degrees in Tourism, national Accountancy degree in International Commerce, and degree in Business and Administration. It also supports the Portuguese-language learning community through various currently on-going projects, some of which are: The Virtual Library of the Brazilian Student, and the Virtual Learning Community of Telemar, sponsored by the Brazil’s largest telephone company, involves teacher-training and thematic site-creation-and maintenance with the elementary schools in 16 states of Brazil (more than half the national territory). Others are the Data Base of Educational Software in the Portuguese Language, the creation and maintenance of thematic sites on the Internet for 3,000 schools of the Saô Paulo, the creation and development of Access Saô Paulo.
"Telecenters" in Low-Income Housing Projects in the State Government, and the Center for Professional Development of Educators, among others (http://www.usp.br).

SOF offers the full range of services provided by its implementation of the Virtual Campus technology platform accessible from home. Students are assigned a virtual counselor in order to help them through the learning process. A tutor teaches them in each subject. At the beginning of each course, digital materials are made available on the Virtual Campus. Paper-based materials are sent to the students before the course begins. The educational technology needed to run the project was obtained from the UOC. Technology used for the academic management of the project was developed locally.

SOF has its own servers where the database is housed. The virtual campus software is supplied by the UOC through a non-transferable license. The licensed UOC system corresponds to the front-end functionality, which supports (1) communication in the learning environment between the different components of the education community: students, faculty, coordinators, and (2) the supporting functionality: library, institutional messages, etc. The system is written in CGI/Perl and runs under Sun Solaris system. The database adopted is ORACLE. The systems linked to the Virtual Campus, i.e. the back-end systems, have been developed by a satellite company of SOF. This provides support to the administrative and academic management applications.

Brazil is a developing country, so the popularization of the computer and the access to the Internet are not as high as European countries. Insufficient internet development was the determining factor to make SOF to offer free internet connectivity.

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7 The USP website is http://www.usp.br.
as a part of the education service. In addition, SOF paid a great deal of attention to more traditional media to deliver the learning activities. Some widely used techniques include: (1) Audio Teleconference. The telephone network solution was chosen initially because of its two-way interactivity, ease of access, and cost-effectiveness. However, SOF provides strong supports through the use of on-site coordinator and continues to improve the technological aspects of the delivery system. (2) Visual Teleconference System: The basic system configuration includes a computer, a high-speed modem and an electronic writing tablet. An enhanced system may include a document scanner and a video camera. The combination of equipment allows the simultaneous sharing of sound, sight, and data messages between sites and thus enables interpersonal interaction at a variety of cognitive and affective levels. SOF used creative ways to humanize their technologically delivered classes. Faculty is scheduled to have at least one face-to-face class during the semester so that students can get acquainted with each other and with the instructor. Other faculty may have pictures taken at each site and circulate them among all the participants, or encourages students who live near each other to meet for lunch in order to get to know each other.

SOF offered its first lesson in March 1999. It was the first virtual university in Brazil and was the only one of this kind at that time in Latin America. Since then, about 3,000 students have studied at SOF.
CHAPTER 4

CHINA-EU E-LEARNING PROJECT

4.1 Project Background

Established in 1938, the International Council for Open and Distance Education (ICDE) is the global membership organization of the world community of open, distance, lifelong and e-learning organizations, corporations, government agencies and professionals active in this field. ICDE is also a world federation of national and regional associations of open, distance and e-learning institutions. Through its membership and partnership structure, members in 142 countries are represented. ICDE facilitates international cooperation, communication and development in distance education and open learning throughout the world.

ICDE is officially recognized by the United Nations as the global non-governmental organization (NGO) responsible for the field of open and distance learning, and is affiliated to the United Nations through UNESCO. ICDE, as the only NGO, is also an affiliate member of the South East Ministers of Education Organization (SEAMEO) and a World Bank partner organization.

The ICDE European Chapter is based on members in all EU member countries, and has offices in Germany, France, Spain and Norway. The ICDE European Chapter is a member of the European Open Distance Learning Liaison Committee that cooperates closely with the European Commission. ICDE is the founding organization of the European Distance Education Network (EDEN), a project that was supported by the

1 The web site of ICDE is http://www.icde.org/
European Commission in 1990-91. ICDE cooperates closely with both EDEN and EADTU. In 1999 and 2001, ICDE organized the world conferences in open distance learning in Vienna and Dusseldorf with the support from the European Parliament. The President of the Federal republic of Germany, Dr. Johannes Rau was the patron of the 2001 ICDE World Conference in Germany, which was organized in cooperation with the Fern Universitat in Germany.

ICDE supports a number of local ICDE offices around the world that offer local administrative services. In Europe, in addition to the international head offices in Barcelona and Oslo, there are two such local offices, in Germany and France, and they are both hosted by the University of Oldenburg and CNED.

The National Education Examinations Authority (NEEA) is a semi-government organization of China which is affiliated to the Ministry of Education of the Chinese Central Government. The primary task of NEEA is to administer and oversee all nationwide education examinations. One of the biggest programs of NEEA is to promote and manage the SHEE throughout China under the authorization of the Ministry of Education. NEEA has provincial offices in each province and smaller regional offices in lower provincial levels. These provincial and regional offices, together with general universities and colleges, are the main forces to provide social assistance to self-taught examinees from SHEE.

The mission of the China-EU project is to conduct a pilot study as the first phase in a program to plan and implement a virtual learning system. This will include a Virtual Platform and student support and tutoring system that will allow the NEEA to improve the accessibility and the quality of the learning opportunities offered to the
millions of people in China who prepare for the self-taught examinations in a perspective of lifelong learning. This project will promote the concept and implementation of learning communities, and provides quality standards and assurance in this education and learning system as well.

This project also aims at obtaining a better understanding of the current EU and Chinese open and distance education models and strategies. The exchange of information and knowledge about the different systems is very relevant to the development of the project.

The objectives are to:

1. Create a Virtual Education model and strategy adapted to the specific learning needs of Chinese students undertaking NEEA’s self-taught examinations, using the experience and know-how of the European partners.

2. Establish efficient trans-national cooperation procedures for the co-design and co-development of Learning Programs and Materials.

3. Develop an E-Learning Platform adjusted to the Chinese partner’s requirements to improve the accessibility and quality of lifelong learning, taking advantage of the information and communication technologies and experience of the partners.

4. Design, test and implement a common e-learning platform and tools that could serve as the vehicle for the operations of virtual training programs.

5. Train Chinese support staff about strategies for implementing virtual learning environments.

The principal beneficiaries of the project are the following:
1. EU and Chinese educational authorities. The project will promote efforts to increase the mutual understanding of the open distance learning educational models coming from European tradition and Chinese tradition. Knowledge of the current state and future prospects of open, distance and e-learning in the People's Republic of China is essential for any European countries wishing to establish or develop ties with Chinese partners.

2. EU partners and NEEA will obtain an insight and better understanding of how their respective educational models are similar, or differ. Special attention will be given to differences in terms of how target populations are identified, the learning habits, the role of learning materials, the tutoring action, the level of support (support centers, libraries, resource centers), student evaluation and assessment schemes, etc. All these elements need to be well understood in order to maximize the benefits and further enhance the cooperation.

3. EU and Chinese students, by increasing the number and quality of learning programs, specially, by being able to access courses and programs from the foreign regions (EU for the Chinese, and China for the Europeans), can enjoy the high quality e-learning services.

4. ICDE, as coordinator of this project is fulfilling its mission: promoting lifelong and e-learning throughout the world; fostering international collaboration in education and training; and creating an appropriate environment for collaboration and the planning of new educational initiatives among its members.
5. NEEA, as the partner in China, will benefit by the design and implementation of a brand new education capacity for the millions people who are preparing for NEEA exams throughout China. In that, a new, high quality and efficient e-learning system will be put in place and operated by NEEA for the benefit of all SHEE students. This is expected to greatly enhance and improve the lifelong learning opportunities in China among people from all different backgrounds and professions.

In this project, the world association for distance and e-learning, with its international headquarters based in Spain and Norway, will offer expertise for China to draw on. This will promote further cooperation between Europe and China, as well as with Brazil. This project is a first pilot project to create a virtual learning model in a province in China. The result of the pilot work will be evaluated, and considered before taking the next phase of implementing this project to nationwide scale in China.

4.2 Why is Spain successful?

The creation of UOC, the first virtual Open University in Spain, represented a revolution in the university environment. According to UOC (2004), in the academic year 1995-1996, the UOC launched its teaching activity by means of a pilot course with 200 students only. In the following academic year (1996-1997), the number of students grew to 1,500 rapidly. At present, the total number of students involved in all its educational activities is close to 24,000. The figure will probably keep growing in the future because of the expansion of the university in the Latin American market, with university studies accredited in the Spanish language. This growth is also caused by the
fact that, due to its wide acceptance, the supply of continuing education in Spanish has been expanded (UOC, 2004).

A potential reason contributed to the success of the UOC is the e-learning Initiative launched at the European Council in Lisbon on March 2000. The e-Learning Initiative aims to enhance the use of new multimedia technologies and the Internet to improve the quality of learning by expanding access to resources and services, as well as promoting remote exchanges and collaboration. As a result of this initiative, each European country supports different e-learning activities, according to its own needs and plans. Taking into consideration the policies and initiatives developed to support the development of e-learning, the Spain government has decided to adopt the following strategies:

1. To provide all schools with the equipment and facilities needed to access new information and communication technologies;
2. To develop Internet courses and training;
3. To set up an observatory and laboratory responsible for the educational applications of information and communication technology (ICT), thereby supporting innovation and development in such applications;
4. To strengthen cooperation between Latin America and Europe in the area of ICT in education.

According to a study entitled “The situation of e-learning in Spain 2003” provided by Spanish Association of On-line Training Organizations, e-learning took off and begun to fast growth from 2001 in Spain, It has been enjoying consolidation and growth stage from 2002 to 2005, and will reach its mature stage at 2008.
Factors such as globalization, new technologies and demographic developments represent an enormous challenge to the education. Accessing to lifelong learning has become the most competitive and dynamic knowledge-driven economy in the world. Europe Council believed that most of the European countries still lag far behind in the use of the new information and communication technologies even though they enjoy one of the highest levels of education and the necessary investment capacity. Therefore, e-learning is designed to enable Europe countries to catch up by intensifying its efforts.

The Spanish government is the crucial force to make UOC successful. UOC is a non-profit private foundation and the Catalan Government holds the majority in the trusteeship. In the beginning stage, an online course may be more expensive than traditional ones; therefore, registration fees alone are unlikely to support private initiatives in the long term. The UOC received about a half of its grant from the government. Besides, it started by offering official degrees rather than only providing continuing training programs. This is a very important factor for its success since academic credibility is seen as the key to gaining user confidence and ensuring long-term success. This experience is very similar to that of China.

4.3 Development of the E-Learning Model in China

In order to have success in future collaboration, the focus of the pilot work package is to devote an important part of the initial efforts to the conceptualisation of common models that will allow more ambitious projects in the future. The pedagogical model will clearly identify the roles and functions of the agents involved in the training
process (students, tutors, administrative staff, etc) and of the required elements (teaching activities, communications environments, support tools, support centres, etc) taking into account the differences and characteristics of the open and distance learning.

The first task of the pilot work package was to analyze the map of European and Chinese distance education tradition, according to time and space variables, in order to identify a common educational model that will cover citizen's needs.

The next step was the re-design of the NEEA self-taught pedagogical model to enable it to organize its activities in a virtual environment, the Virtual Platform. The Virtual Platform allows students and professors to participate in learning, social and communication activities overcoming time and space barriers.

The objectives of the project include:

(1) To analyze the distance learning systems from the EU partners and the Chinese partner; (2) to define and design a common Learning Model that includes Virtual Learning Environments and Materials, and (3) to identify the elements (tutors, learning materials, evaluation criteria, guidelines, etc) involved in the learning model and definition of its function.

The self-taught pedagogical model should be based on the design of a Virtual Platform that would be in the form of a computerized network. Any person with a computer and a modem should be able to have access to this virtual platform from any part of the territory at any time. Interactive communication between students and teachers in different times and occasionally in real time would be allowed in the functions. The interactive communication can involve: Designing and implementing a high quality student support and tutoring system, allowing teaching and learning.
communication between teachers and student, including student counseling, exercises and assignments for the students, as well as workshops and ongoing evaluation, virtual forums, etc; the interactive communication between the students; the access to the internal database of the Platform (virtual library, board table, etc); resolving questions and administrative procedures (inscriptions, files, certificates, etc.); access to complementary services; access to external database and connection to Internet.

The pedagogical model can also be improved by some other elements, which must be analyzed as well, for example: multi-media didactical materials, personal support (tutors and consultants), centers of support to the students, etc.

4.3.1 Content

This work package is focused on the design of learning programs and materials. The main task involves two objectives: to design Learning Programs and to design Learning Materials.

The Learning Programs are the documents that organize the content. The Learning Programs should propose the methodology of the work and its temporal distribution, considering at the same time the evaluation criteria. The objectives of the Learning Programs include: making the self-taught working plan of the students, suggesting the most appropriate ways for the assimilation and integration of the contents, facilitating in the critical times during the learning process of the students, guaranteeing the possibilities of improvement for each student, and considering their diversity.
Learning Materials is an essential element in distance educational models and therefore, it is important to define quality standards and design appropriate criteria which can guarantee the optimal use of information technologies and multimedia materials. The materials should strengthen the idea of regarding interactivity as the basic criteria.

Learning Materials should incorporate the objectives of the subjects, the contents, the activities to be developed to understand the contents correctly. Complementary lectures and the auto-evaluation exercises for students are recommended.

4.3.2 Teaching Methodology

The learning model for the NEEA e-learning project is to be built on problem based learning. Problem based learning is an instructional procedure that, in contrast to conventional education, transfer control over the learning process from the teacher to the students (Schmidt, 1993). Students are encouraged to formulate and then follow their own learning objectives and to select the learning resources that best suit their information needs. The role of teachers lies mainly in providing advice and suggestions for further work.

The following characteristics of the problem-based learning approach have been identified as common to most problem-based learning courses:

1. “Real life” problems are used to engage the students in the learning process as much as possible.
2. Students collaborate in small groups to develop a solution to the problem.

3. The groups are assisted by a facilitator who is not necessarily an acknowledged expert in the content area that related to the problem.

4. Information on how to develop solutions to the problem is not usually given, although resources are available that assist in the process of approaching and solving the problem.

Required areas of learning are identified by the students through their process of solving the problem and resources are available (either supplied or sought out by the students) to assist in these areas. (Boud, 1991)

It is obvious that all these characteristics suggest the utilizing of a computer/Internet learning environment which provides the richest information resource. Also, collaborative learning is a key part of the problem based learning. A small group of students that meet in a regular time will be helpful.

4.3.3 Delivery Technology

A computer/Internet supported collaborative learning environment can efficiently support the SHEE eLearning model. The components of the delivery
environment can be divided into three groups where components in particular group are used to support functions concerning:

-- Access to external knowledge sources

-- External communication

-- Communication in a group

The first group of components consists of tools that are used to access different external information resources. An important tool here is the virtual textbooks. Virtual textbooks are multimedia hyperlinked texts, audios and videos. They can be implemented in different ways. Very often they are stored on CDs, but mostly they are stored in WWW (World Wide Web) sites which can be downloaded, private and accessible via local intranet or public cyberspace.

The very important feature of WWW is its capability to deliver information right after the information has been put on the server. It provides real-time information delivery at very low cost therefore will play a very important role and serve as the primary delivery method. What's more, WWW is relatively simple to use and at the same time it is not difficult for users to create their own WWW pages. The HTML language, which was developed for this purpose, is simple to use and there is a number of automatic software that can translate different text formats, such as .doc, .rtf, or .tex to HTML.

External communication refers to communication with people who do not belong to a group of students and are not formally engaged in group activities as a tutor. The most common communication pattern for external communication is one-to-one (e.g. a single member of a group communicates with an individual outside the group on
behalf of the group or himself). In our learning environment, this approach is primarily used to get some specific information from individual expert. Email is the most popular and the most convenient tool for this type of interaction.

Communication in a group is certainly very important for the implementation of our learning model. Most important activities that need support are: small group discussion and debating, learning partnership, peer counseling, team presentation, and informal socializing. These activities usually can not be made face to face due to the time and space limitations. The delivery technologies that are suitable for these activities include computer conferencing system, which represent widely available collaboration tools for one-to-many and many-many communication patterns. In the cases where only two students are involved or when discussion is not interesting for other members of a group, email can be used as well. Internet Relay Chat (IRC) and similar tools can be used for this kind of reaction as well. In recent years, desktop computer has become very popular in China. Team presentations require a synchronous approach. A shared whiteboard application as a part of multimedia conferencing system seems to be the best solution. This will allow controlled and synchronized presentation of text and different type of images together with audios and videos. An alternative is guided presentation of WWW documents if the conference system is too expensive.

Since social communication is an essential component of education activities, online educational environments should provide opportunities for informal discourse. An online café or BBS (Bulletin Board System) system can bring a sense of community to the users, forging a social bond that may offer motivational and cognitive benefits.
can also be implemented by means of simple conference system, IRC or even the
desktop video-conference system.

4.4 Development of Platform

4.4.1 Pilot Platform: IdeaSolutions

The e-learning platform implements the extended services needed to deploy a
virtual community for open distance teaching and learning. At the early stage of the
project, the platform used was the one that is being used by the UOC. The Virtual
Campus, commercially registered as IdeaSolutions, offers benefits as a high scalability,
capable to support all the activities of a distance teaching operator including
registration, course management, accreditation, monitoring, course authoring and
evaluation. IdeasSolutions offers a very high flexibility to accommodate any kind of
complex course structures, such as multi-annual degrees, subject and modules
clustering, etc.

IdeaSolutions has been designed specifically for e-learning through the Internet.
The tool allows the creation and management of complex training programs with the
focus on study, subject areas, and learning modules. It is designed to be an economic,
intuitive, easy-to-use environment for students, professors, managers, and
administrators. The IdeaSolutions administration tool aims to be flexible enough to

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9 IdealSolutions is a registered trade mark. The website is http://www.ideasolutions.it. A
trial version of IdealSolutions is downloadable from this website.
manage learning environments across a range of company or departmental contexts, and has a customizable interface. It is also language independent.

IdeaSolutions is installed over Oracle Database, Oracle Application Server and Netscape Web Server. It has been developed with the most frequently used programming languages on the market and uses TCP/IP and HTTPS Internet protocols. It is adaptable to the Information Management System (IMS) standard for the management of training programs. IdeaSolutions has an Application Programming Interface (API) that allows the integration of external applications within the tool, and standardizes access to the database. It has a customizable graphic user interface and also allows the input of various types of teaching materials.

IdeaSolutions integrates common used applications in its system, and the applications includes: electronic messenger service, which is email engine with message monitoring system; training spaces including communication tools (forums, debate, trainer bulletin board); chat enabling dialogue or conversation among many users in real time; administration environment for managing student registration and privileging assignment for registered users; content management for input and output of content information and teaching materials (HTML, images, texts); shared disk for remote file input and output; resources manager for multimedia teaching resources database that allows searches according to pre-established criteria and a search engine.

IdeaSolutions software is structured through layers and modules. The modules implement the user functions (messenger service, personal disk, chat, etc.) and the additional applications (publications manager, help module, training program catalogue, multimedia resource manager). The layers interconnect the modules, control internal
and external data transmission, and give support to transversal user services (e.g.,
graphic interface, integration of external applications through an API, access control,
and security).

The system uses one or more Sun servers connected to the Internet. Connections
are made through the devices such as telephone network, ISDN, GSM cell phones,
cable, and so on. The system can therefore be accessed in remote environments,
requiring only an Internet connection and a browser. Server system requirements
include: Sun-based server system, Sun Solaris operating system, Oracle database. IE
Web server and Oracle Web Application server. Overall systematic can be presented in
Figure 1 and Figure 2. The functionality and features are described in Table 1.

4.4.2 NEEA Platform

The platform within the project will function as the bridge between students,
students-teachers/tutors, content, and course administrators and project partners for the
latter development of pilot courses. After the pilot stage, a new platform which is more
suitable for China has been designed and built based on the feedback from the users
(faculty and students).

The new platform and all the supported services can be accessed through a
standard Internet browser. Bandwidth requirements have been taken into account in the
design as to facilitate students from areas with low bandwidths; the minimum required
is 28kbit/s modem.

The teaching and learning process involves many activities. An educational
system should be able to provide a variety of functions to support these activities.
Though it is not easy to give a precise definition of an e-learning platform, the concept of the platform is relative and depends upon the scale of targeted educational provider and organization. To cover all scales of virtual communities, a new platform will be built on a general framework that consists of several layers among which the tool layer and the room layer are of primary importance. The tool layer includes a set of toolkits for supporting administration, course, collaboration, virtual instrument, database management and system maintenance. The room layer includes virtual administration office, virtual private office, virtual course room, virtual collaboration room, and virtual laboratory. These five types of virtual rooms will be further combined to construct different scales of virtual schools/universities. The platform differs from other systems in the following ways: (1) It supports a wider range of activities beyond just teaching online course in a school/university. (2) It provides a virtual office for each registered user (staff, teacher or student) to manage personal activities and data to enter other virtual rooms. (3) The hyper-environment architecture of virtual course rooms allows many simultaneous activities related to an online course. (4) Any scale of virtual schools/universities can be built by flexibly assembling and customizing the rooms since each room is designed and implemented as a relatively independent unit.

The following criteria and features are considered fundamental when the new platform was designed:

1. Openness: The system should enable access and use from any types of computer platform with standard web browser via the Internet. This will provide truly global teaching/learning with platform independent applications.

2. Ease: The system should provide management and authoring tools with user friendly
interface to make it easy for users to conduct teaching/learning activities.

3. Reliability: The system should enable recovery from emergent failures of computer systems or networks, and adaptation to network congestion and bandwidth changes.

4. Scalability: The system should be easily scaled from a small scale to a larger scale.

5. Extendibility: The system should be able to be continuously updated and extended with new functions and technologies developed.

The general architecture of the new platform to be developed by NEEA and ICDE is as Figure 1. The blue print of the platform consists of two areas, the open area which is accessible by anybody and the restricted area which can be accessed by the registered member only. The restricted area includes many virtual rooms associated with different activities in the virtual campus. With considerations of the scalability criterion, each type of the rooms are implemented as relatively independent units, for example, they can be easily assembled or customized for building different scales and types of virtual campus.

The platform will be used by both the provincial offices and smaller regional offices of NEEA. The regional office usually provides service to a little number of learners but the provincial offices can run very big virtual universities. The biggest difference between the provincial offices and regional office is that the latter usually requires more complicated administrative functions than the former. A virtual administration office is designated for managing users, curriculum, facilities, resources, plans, etc. The virtual administration office has the following functions:

1. User administration: it will manage different users including staffs, teachers, students, and visitors. It deals with users’ profile and statistical data.
2. Curriculum administration: It manages the curriculum and handle teachers’ request of creating, changing, or canceling a course. It also handles students’ request of selecting or withdrawing from a course.

3. System administration: it includes configuration, maintenance, and resource allocation.

An individual person owns a virtual private office where he/she manages personal activities and private data and entering other working rooms. This private office enables users to work or study comfortably and efficiently and has the feeling of physical university. A private office includes three sets of functions: (1) the user manages personal activities and data, such as schedule, password, etc. (2) A teacher can create a new online course or a student select a course. (3) A user can use the mechanism and hyperlinks to enter other rooms.

In a conventional university, a course is usually taught in a classroom. It seems natural to build a virtual classroom to provide an online course. Usually, a real classroom is often used for many courses in different time. But an online classroom is, in principle, designed just for one course and should be always open so that students can access the course at any time upon their schedules and paces. The virtual classroom is incorporated with many software tools to systematically support for a teacher to author of online materials, organize teaching activities and instruct students, and for a student to access the online course and efficiently interact with a teacher and other students. The system will automatically assign a virtual classroom for each course.

To be able to support a wide range of courses with different content features and to foster a variety of teaching/learning styles for different teachers/students, the virtual
classroom will be designed and implemented based on a general and flexible architecture. It consists of the following four parts:

(1) To master the contents of a course, students have to read a textbook, execute simulation, and conduct experiments and exercises. The ideal case is that students can explore different contents related to the course they are taking. The exploration environment helps teachers to efficiently prepare lesson contents, simulations, experiments and exercises and enables students to effectively use those online materials.

(2) To help students' learning, some supplementary information or data related to a course is bonded together and placed in the supplement environment that includes: syllabus, reference, schedule, FAQ, and announcement.

(3) The evaluation environment is an interactive environment under which teachers and students can conduct the following activities: a) Teachers flexibly create or modify online quizzes, online exercised or online exams. b) Students submit or participate in online quizzes or online exercises and even take online tests. c) Teachers check students' assignments and tests automatically or manually and report the results to the students promptly. d) Teachers access students' learning progress data based on some statistics.

(4) It is widely realized that teaching and learning can benefit much from a variety of collaborative activities. Collaborations among a group of remote people are generally classified into synchronous collaborations that refer to group joint work at the same time and asynchronous collaborations that refer to group joint work at different time. Both the synchronous and asynchronous collaborations should be supported and the corresponding collaborative functions will be incorporated into the system. The
functions for supporting the collaborative activities in the virtual classroom are bonded together in the collaboration environment that includes: Q/A (email based), forum (BBS), chat (BBS), meeting (Video based), Tele-lecturing (Video based), and group projects (Video bases).

In addition to a course oriented collaborative activities such as meeting and Tele-lecturing, there are many types of group collaborative activities, such as non-course oriented meetings, seminars, and conferences. The NEEA platform will develop a generalized desktop groupware system that enables a group of remote individuals to flexibly and naturally conduct their collaboration teaching/learning/working over the Internet. The flexibility refers to ability for people to use the system for a variety of collaborative activities without constraints on collaboration types, working styles, and group scales. The naturalness refers to people feeling that their collaborations are as natural as in a real room. As a general purpose collaboration room, the system supports a variety of group or team oriented activities. In fact, it is customized to be a more concrete room related to a specific collaboration type, such as meeting room for a group of people to held a meeting, seminar and conference; Tele-lecturing room for a teacher to give a lively lecture to remote students; project room for students to participate in a course oriented group project; team room for teachers and students to participate in a research oriented joint project; or a café room for informal discussion or general chatting. To support many different collaborative activities, the system facilitates a variety of objects including chat-board, whiteboard, planning, voting, applet for interactive simulations, plain text files, HTML file or web page, image, graphics, audio, video, animation and recorded object.
For many courses, students are required to learn through online experiments and simulations. A virtual laboratory is provided for students to conduct course related experiments and simulations via networks. A virtual laboratory is constructed on the basis of a number of virtual instruments and a set of simulation tools. After the completion of a curriculum in a virtual school, system managers can construct a number of laboratories for those courses that require students to do online experiments or simulations. Consequently, the managers have to select associated virtual instruments and simulation tools for inclusion in a virtual laboratory.

The graphical user interface of the platform will be personalized according to the result of needs analysis. The task will consist of designing and implementing the menus, options and general structure of the platform to accommodate the EU and Chinese partner’s requirements. The multi-lingual capability of the platform will be put to a limit, as it will be necessary to accommodate Chinese characters. The Internet-based and open nature of IdeaSolutions will help integrate modules and components already available on the market.

The platforms in a number of server sites will be deployed, in which the courses will be run. It is foreseen that at least there will be two working sites, one in EU and one in China. The task will take into account the installation and training of the technicians responsible for the operations of the platform.
CHAPTER 5

CONCLUSION AND DISCUSSION

E-learning has created a new concept of university, one that places the student at the center of the learning process, breaking through barriers imposed by time and space, providing education anywhere, at any time and at the pace the student decides to set for him/herself. E-learning model uses information and communications technologies intensively, based on a virtual environment that stresses communication and relationships between individuals. An e-learning institute usually is a virtual organization with no physical campus, yet with an online teaching and management structure, capable of facilitating interactive communication between professors and students, with complete timetable independence -- a characteristic normally known as synchronism. The virtual campus contains everything that can be found on a conventional university campus: teaching, research, dissemination of knowledge, as well as student services. On the virtual campus, the student is surrounded and supported by a combination of people, services and resources with the sole aim to facilitate his/her learning.

The concept of e-learning as an advanced system for training and education using information and communication technologies has been attracting increasing interest in recent years in many countries. The flexibility offered by this new learning system, together with the great possibilities provided by information and communication technologies, helps to explain, to some extent, this social and economic
phenomenon, and at the same time opens a broad field for research and development in the near future.

E-Learning is an effective learning process created by combining digitally delivered content with learning support and services. It provides a new perspective in the understanding of distance training thanks to the possibilities provided by the Internet and information and communication technologies. Although distance training was implemented a long time ago, Internet and information and communication technologies have introduced new ways to complement the traditional methods of distance learning at all training levels to. The complexity and success factors that help produce a successful e-learning implementation not only lie in technology and finding the right content, but also consist of both learning strategy and organization and process issues.

First of all, the government involvement plays a very important role to promote e-learning in regular education system. Government regulations have not kept pace with the development of e-learning. China, like other countries, has found the benefits generated from the fast developing information and communication technology. Chinese government and education institutes have noticed the importance of e-learning mainly due to the following reasons: (1) growing role of informal learning, which enables many organizations' undergoing efforts to create learning programs with a more balanced mix of formal and informal contents; (2) increasing centralization of learning and e-learning management which enables the government taking a more national view of the e-learning and learning investments, and (3) reduction in the cost of e-learning which enables companies trying to rationalize e-learning investment and find practices that provide value for money.
China-EU project is still an on-going project, therefore, it is too early to say for now if it will be successful in terms of providing quality education and more accesses to learning. However, some important points can be observed from the study and practice. First of all, the most important point is that a successful program must be based on a thorough understanding of the market being targeted. This needs to be based on an in-depth analysis of the expectations, culture and learning styles of targeted students, with the style and nature of the provision then tailored explicitly for those expectations. There is no such thing as a generic product that is easily transferable from one market to another. In the beginning of the project, both UOC and NEEA planed to utilize the UOC platform Idealsolutions but it was proven soon that China is totally different from Spain, not only on language and culture but also on learning model and style. When a new platform is developed, its design will need to be based on an analysis of the nature and characteristics of the target groups and the decision makes should have a clear strategy in mind.

However, it is often more difficult than it should be to promote the wide applications of e-learning. It is not only a matter of building infrastructure, but tangible broad policy guidance and active government intervention is also necessary. In China, the world of education is highly complex and deeply entrenched in national system where priorities are much determined by political expediency and the need to balance budgets. In most regions, even schools and universities are part of a centralized state system enmeshed deeply in bureaucracy, and this makes them slow to react, or even impenetrable to external demands for change.
Figure 1: UOC educative model

This figure is downloaded from http://www.uoc.org
Table 1. IdealSolutions Functionality and Features

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Software Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal communication and interaction</td>
<td>Electronic messenger service, chat, debate systems and forums, message monitoring system at user level</td>
</tr>
<tr>
<td>between members of a community at different levels (individual, group, classroom, community)</td>
<td></td>
</tr>
<tr>
<td>Environment structure management, direct access to courses, modules, and work tools</td>
<td>Environment domain administrator</td>
</tr>
<tr>
<td>Advanced user management (student registration, deletion, and modifications)</td>
<td>Administrator of environment users</td>
</tr>
<tr>
<td>Single-key, centralized access control to the environment and all its applications</td>
<td>Administrator of environment assignments, license module, and access key and session key expiration; user validation system (username and password)</td>
</tr>
<tr>
<td>Content management at user level</td>
<td>Remote personal disk system</td>
</tr>
<tr>
<td>Classroom-level repository of resources and information</td>
<td>Shared disk</td>
</tr>
<tr>
<td>Content management (teaching materials and common spaces) from the environment</td>
<td>Content manager</td>
</tr>
<tr>
<td>Integration of external applications</td>
<td>Application Programming Interface (API) system</td>
</tr>
</tbody>
</table>

11 This table is downloaded from http://www.ideasolutions.it
Figure 2. System diagram of Virtual Campus with associated networks and user types

This figure is downloaded from http://www.uoc.edu.
Figure 3. Modular scheme of IDEASolutions architecture\textsuperscript{13}

\textsuperscript{13} This figure is downloaded from http://www.idealsolutions.it
BIBLIOGRAPHY


