

## *Research on distance education development in China*

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### **Abstract**

Distance education is among the significant fields for the application of educational technology. Distance education in China has gone through three phases, namely: correspondence-based education, radio and TV-based education and online education. This paper was based on educational technology application, and the historical, dialectic and developmental perspectives. It analyses the social and technical background, the history of development, pilot practice of e-learning (task, policy, administration, funding, scale, structure, resource construction, teaching modes and services, etc.) and the current impact of scientific research on distance education in China. Finally, it discusses the achievements, issues and trends of distance education through literature analysis, comparative study, deduction and induction.

### **Social and technical environment of the development of distance education in China**

*Chinese social demand for higher education and lifelong learning is growing*

Since 2000, the gross enrolment rate of higher education in China has kept increasing by an average of 1.5%, and by 2007, it reached 23% as shown in Figure 1. In 2007, the number of students enrolled in various kinds and levels of higher education institutions across the country exceeded 25 million, surpassing that of the United States and becoming the highest in the world. However, in 2005, the total number of those who had received higher education in China was 67 640 000, only one-twentieth of the total population of 130 756 000 at the end of that year, and much lower than the one-third level in developed countries. Table 1 shows the level of education of the working population in China. It indicates that even though China has entered an age of higher education popularisation, demand for development of higher education including distance higher education is still considerable and the task is still arduous.

With the growing demand for higher education, some cities, communities, businesses and industries in China began to construct digital learning-oriented cities, communi-

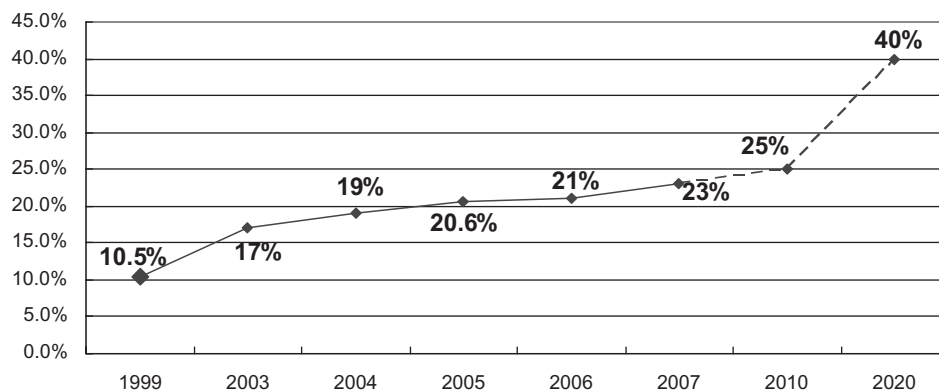


Figure 1: Gross enrolment rate of higher education in China

Table 1: Comparison of education levels of the working population in China (%)

Education levels	Above college diploma	Secondary technical diploma and senior middle school	Junior middle school	Primary school	Illiterate or semiliterate
Fifth census	4.66	12.65	41.70	32.84	8.14
Fourth census	1.87	11.07	32.31	37.83	16.92

ties, towns, businesses and industries employing digital information technology. Learning demand remains strong and the trend has become increasingly apparent.

#### *Distance education infrastructure escalated gradually*

E-learning applications were jointly supported by the China Education and Research Network (CERNET) and the other three backbone networks in China—China Public Computer Interconnected Network, China Science and Technology Network, and China Golden Bridge Information Network. During the period 1979–85, to provide support to radio- and TV-based education carried out by China Central Radio and TV University (CCRTVU), the Chinese government resorted to the national television (China Central Television) for television courses broadcasting. In 1985, China Education Television was launched, and since then, the television courses of CCRTVU have been transferred, gradually at first and then completely, to China Educational Television via satellite broadcast. In 2000, the China Education Satellite Television Network achieved satellite television digitalisation, and then started to serve e-learning employing digital satellite resources together with other satellite communication companies in China; thus, initially forming a digital information transmission network system for e-learning with interactive functions in the ‘unity of heaven and earth’. (Ding, 2005)

Vigorous demand for higher education, education informationisation and construction of a learning-oriented society has created a favourable social and technical environment, and provided a historic opportunity for the development of e-learning.

### **History and current situation of distance education development in China**

*Three generations of educational technology and distance education in China* (Ding, 2005)

Since the foundation of the People's Republic of China, distance education has undergone a process of three generations of educational technology and three generations of distance education.

The first generation of distance education—correspondence-based education—mainly employed the postal communication and printing technology. The starting point was marked by the approval to carry out correspondence-based education in Renmin University in 1951.

The second generation of distance education in China was radio- and TV-based education. This was in two phases. The first was based upon the urban black and white television network. The City TV universities that were established around 1960 in Beijing, Shanghai and other cities used radio and television live broadcast as instructional medium. The second phase, marked by Radio and TV University system represented by CCRTVU, served the whole country and was based upon the colour television network established in 1978. It depended mainly upon such information technologies as radio, television, sound recordings, films, and was later developed into a stand-alone computer version of Computer Assisted Instruction (CAI) and Computer Assisted Learning (CAL).

The third generation of distance education is e-learning or online education, which was marked by e-learning pilots in conventional universities such as Tsinghua University launched in 1998. It is characterised by the integrated use of computer network technology, satellite TV technology and telecommunications technology to transfer instruction information and to provide interactive distance education.

These three generations of distance education currently co-exist in China: correspondence-based education is still carried out in conventional universities and Internet media in tutoring has begun to be widely used. In 1999 'CCRTVU Reform on Talent Cultivation Modes and Open Education Pilot Program' was approved and since then CCRTVU has been ranked among the e-learning pilots.

#### *Pilot e-learning practices*

##### *E-learning projects*

In 1999, the State Council of China approved the 'Action Scheme for Invigorating Education Towards the 21st Century' initiated by Chinese Ministry of Education (MOE), and officially declared the implementation of e-learning projects. Its overall objectives were: to establish an open education network and a lifelong education system and to construct a learning-oriented society by 2010. The project was comprised of four parts:

- Hardware infrastructure construction: to speed up and upgrade network infrastructure (CERNET); to digitalise educational satellite TV and to provide service such as data broadcasting and live TV on personal computer.
- Software resource construction: to construct distance education software resources suitable for Chinese condition.
- E-learning pilot project: to carry out degree and nondegree distance education, explore online learning modes, teaching modes, administration system and operational mechanism, and to explore the application and sharing of online education resources as well as the construction of learning support service system and quality assurance system.
- E-learning administration: to set up distance education standards and policies, and carry out distance education administration, assessment and supervision. (Zhang, 2004)

#### Pilot tasks and developmental phases

The e-learning pilot tasks include the following three aspects:

- Reforming the talent cultivation modes for distance education in an information communication technology environment and promoting development of distance education;
- Conducting distance education research and theory building so as to facilitate the development of distance education programme
- Developing innovative distance education practice including: exploring learning modes, teaching and learning support services modes and guiding the development of distance education services industry.

The development of e-learning pilot project during 10 years can be generally divided into the following phases:

- March 1998–April 2000: the MOE approved the leading pilot projects in Tsinghua University, Zhejiang University, Beijing University of Posts and Telecommunications and Hunan University, followed by Peking University and CCRTVU.
- April 2000–April 2002: the MOE authorised more e-learning pilot projects in a number of research universities. These universities are entitled to plenary rights in programme setting, enrolment and entrance examination, and conferring certificates, etc. in distance higher degree education. By April 2002, a total of 67 conventional universities had been approved to carry out e-learning pilot projects.
- From April 2002 to the present: the MOE established the guidelines for the development of e-learning—active development, standardised administration, services enhancement and quality improvement—and required all pilot universities to strengthen standardised administration.
- In 2007, the MOE initiated of the evaluation of online education selected courses at state level. This marked a new stage of exploration and innovation for distance education. (Chen, Ding, Yuan, Xu & Cai, 2008)

Table 2: Number of students enrolled in e-learning

	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
RTVU (open)	3.06	19.61	47.51	77.88	120.65	160.37	183.04	186.73	198.63	997.48
E-colleges	0.3	2.1	18.4	27.4	66.02	76.22	82.23	92.56	166.18	531.41
RTVU/online (%)	1020	933.8	258.2	284.2	182.7	210.4	222.6	195.4	119.5	

These numbers are measured in thousand.

RTVU = radio and television university.

### Policies for e-learning pilot projects

To ensure the smooth implementation of the e-learning in China, the MOE formulated and adopted a series of policy documents.

As authorised in the document 'Guidelines upon the support of a number of colleges and universities to carry out E-learning pilot project' by the MOE, pilot colleges are entitled to plenary rights of self-determining enrolment plan (entrance exam, the scale), self-determining academic programme setting, self-determining conferring of diplomas and self-determining the application of various teaching modes. In the process of standardising administration, the MOE made an adjustment to policy, prescribing that distance education cannot enrol full-time boarding students and can only confer diplomas and degrees of higher education for adults.

In addition, the Chinese government will promulgate some policy documents, such as the documents by the MOE upon teaching standardisation, curriculum standardisation and carrying out teaching quality assessment of online education.

### Structure of distance education system

There are two types of distance education institutions—single mode and dual mode. Among these, the teaching modes of distance education in conventional universities are characterised by rich diversities, while the RTVU system attaches importance to well-coordinated overall planning. Table 2 shows that since the launch of the pilot projects, the enrolment of students of distance education in conventional universities has grown rapidly, and conventional universities have played an increasingly important role in e-learning.

Off-campus learning centres built and used by pilot universities and by public service system approved by the MOE constitute the two-dimensional models of off-campus learning centres. At present, the public service system of CCRTVU is approved by the MOE. In addition, the MOE approved Prcedu Technology Limited and China Cyber Learning Co., Ltd. to construct joint pilot projects of e-learning public service system in cooperation with related pilot universities. The diversified pattern of learning centres is illustrated by that units upon which the learning centres rely and build upon. Figure 2 indicates the percentage of the number of learning centres categorised by the nature of

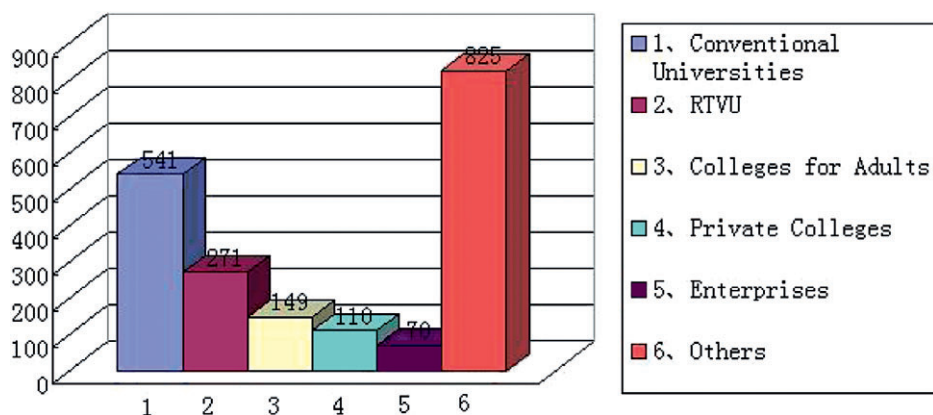


Figure 2: Portion of the number of various learning centres relying upon building units in all learning centres. RTVU = radio and television university

Table 3: Special funding of e-learning projects by the Chinese government

Serial	Projects	Funding (billion RMB)	Department	Period
1	E-learning project	0.46	Ministry of Education	1998–03
2	E-learning key technology and application	0.044	Ministry of Science and Technology	2001–03
3	E-learning support platform	0.035	National Development and Reform Commission	2000–02

dependent building units: the learning centres relying upon businesses and other units account for a large proportion, 35%, of the whole. (Ding, 2005)

#### Distance education funding

Table 3 lists the funding for support of e-learning development by related departments of the Chinese government at launch of the project.

By 2004, the pilot universities had invested 1.84 billion RMB, self-financed and introduced from social funding into e-learning. (Ding, 2005)

There are two main ways of funding for pilot universities: self-financing and joint venture investment with enterprises; the former accounted for 59.7%, and the latter for 40.3%. In regards, to school running modes, institutions in independent operation accounted for 76%, and those in joint operation with enterprises accounted for 23%.

### Construction of hardware and resources for distance education

With regards to hardware construction environment, 48% of the pilot universities employ satellite transmission systems and 57% are equipped with video conferencing systems; 100% of the universities have established the platform for online teaching and teaching management.

We have undergone two phases of distance education resources construction and at present are entering the third phase:

1. Phase of elementary course resources digitalisation: in 2000, the Department of Higher Education under the MOE launched a 'New Century Online Course Construction Project' and built up 200 online courses for elementary courses, case library and databank of examination questions.
2. Phase of basic teaching resources construction in pilot universities: from 2002 to 2006, to meet the needs of online teaching, the pilot universities initiated online course resources construction, supporting large-scale online teaching practice.
3. Phase of quality resources construction: in 2007, the MOE launched the project of online education selected courses construction and evaluation, promoting the construction and sharing of quality educational resources.

### Government macro-administration of distance education

The MOE established systems of admittance authorisation, annual reports and annual inspections and quality assessment (The MOE assessed and evaluated teaching quality of CCRTVU Open Education Pilot Project, and in 2009 it assessed the e-learning courses in conventional universities) for pilot universities. The MOE also launched the national unified examinations of public basic courses. Only those who have passed the examinations are qualified for electronic registration and to have conferred the nationally accredited university degree. Provincial educational administrative departments have set up systems for admittance authorisation and annual reports and annual inspections for learning centres. (Ding, 2005)

### Online teaching, interactive teaching and learning support services

Students of online education, through the Internet, satellite and video conferencing systems, access the platform of online teaching and teaching management, and then enjoy asynchronous and synchronous interactive learning employing online courseware and other online learning resources. The vast majority of the pilot universities in online teaching generally employ a variety of teaching methods—online and offline, fixed and mobile, asynchronous and synchronous, distributed and concentrated modes of blended teaching and learning.

By means of Bulletin Board System (BBS), QQ, MSN, BLOG, E-MAIL, Short Messaging Service (SMS), telephone, etc., students interact with teachers and other students for teaching and learning. Some universities have started to explore interactive teaching based upon intellectualisation, virtual experiment, and mobile teaching and learning.



In the whole process of learning, students will be provided with many learning support services such as information and consultation, coaching and counselling, learning activities and interactive teaching, resources supplement and updating, experiment and practice, technical support and services, advice and motivation through the media and technologies such as the Internet, and face-to-face. (Ding, 2005)

#### Nondegree education and learning-oriented society construction

Pilot universities also offer society-based nondegree education projects. In 2006, the MOE implemented a teaching reform project called 'Digital learning harbor and lifelong learning society construction and demonstration.' Seven pilot centres were selected from communities, businesses, industries and towns for the construction of digitalised learning-oriented grass root organisations by the government, universities and the society, developing digital learning practice and exploring a beneficial way to construct a learning-oriented society.

#### Development of industry of distance education

IT enterprises serving distance education have initially formed an industrial chain and industrial groups. The pilot universities cooperated with companies in technology, capital and other fields. Prcedu Technology Limited in cooperation with eight e-colleges of conventional universities (such as China Renmin University) was listed on the Hong Kong stock market in 2007.

#### *Modern distance education pilot studies*

##### International academic exchanges in distance education

As members of the International Council for Open & Distance Education (ICDE) and the Asian Association of Open Universities (AAOU), CCRTVU and some colleges and universities have hosted a number of international conferences by the ICDE, the AAOU, SCOPE and the United Nations Educational, Scientific and Cultural Organization (UNESCO), such as the '2006 International Forum on Distance Education (Guangdong)' and the '2007 International Distance Education Advanced Forum (Beijing)'. As a UNESCO chair in China, Shanghai TV University has hosted a number of international seminars on distance education. (Ding, 2001, 2003c)

#### Talent cultivation in distance education programmes and relative scientific researches

Beijing Normal University, South China Normal University and Capital Normal University have set up institutes of distance education research carrying out studies in distance education, and started to cultivate postgraduates whose focus is on distance education. Among these, Beijing Normal University has begun to cultivate doctorate postgraduates. The Institute of Distance Education Research under CCRTVU is dedicated to distance education research. (Ding, 2004)



Conventional higher education institutions and CCRTVU have undertaken national key research projects on distance education, and gained great achievements. (Ding, Xu & Mu, 2004)

### **Achievements, issues and trends in distance education in China**

#### *Pilot achievements*

1. By the end of 2007, the pilot universities had established a total of 362 disciplines and 2071 programmes covering 10 disciplines in higher education. The number of programmes exceeded that of conventional universities. In 2007, 1 864 800 students were enrolled in national online education; annual graduates reached 1 394 700, and the number of students participating in this kind of learning totalled 3 648 100. In the same year, the number of students enrolled in online education for academic degree (specialist degree, bachelor's degree) diploma equalled 33% of the total of 5 659 200 in conventional higher education.
2. By 2007, a total of 20 834 online education courses had been developed. Among these, shared courses on campus reached 7553 and intercollegiate shared courses amounted to 5526. Online education courses were included in the project of national selected courses construction the first time in 2007. With first-class teachers, first-class instructional design, first-class teaching resources, and first-class teaching management and support services, online education courses are the model. Between 2007 and 2008, the MOE identified a total of 99 national online education quality courses.
3. After 28 years of development, the system of China Radio & TV Universities have formed a modern distance open educational system comprising of CCRTVU, 444 provincial RTVUs, 945 RTVU branches at the municipal level and RTVU work stations at the county level and instructional classes (nodes). This system is operated in accordance with the principle that 'overall planning, operating based on division of levels, administration at different levels, and cooperation based on division of labor.' The RTVU system includes at least five mega-universities: CCRTVU, Shanghai TV University, Sichuan Radio and Television University, Jiangsu Radio and Television University and Henan Radio and Television University.
4. Following 10 years of development, 67 national conventional universities have established a total of 5034 off-campus learning centres. Among the 5034 centres 1247 are located in the western areas, accounting for 24.78% of all the learning centres, providing strong support for education in the western areas and the State's strategic development of western China.
5. Construction of education informationisation has been promoted, and the application of information technology to teaching/scientific research has been enhanced in pilot universities. The industry of education informationisation and distance education has developed rapidly, vigorously advancing the development of distance education and related programmes, forming a new growth point in the industry of information technology.
6. Standardised administration has achieved remarkable results, and the system of online education quality administration has become mature. Nondegree distance

education has made great progresses. Through the development of distance education, the construction of the learning-oriented society has been launched.

7. Significant progress has been made in scientific research, talents cultivation and personnel training, academic exchanges, and disciplinary construction in distance education. (Ding, 2005)

### *Major issues*

Issues related to social environment:

- Contradiction between school scale and teaching quality: the main contradiction of distance education in China is between the rapid growth of the number of enrolled students in distance education and teaching quality.
- Emphasis upon the degree education: both the pilot higher education institutions and the RTVU system lay greater emphasis upon degree education;
- Standardisation of school running: problems such as inadequate control and non-standardised management exist in off-campus learning centres;
- Examinations: there exists serious cheating problem by some students in examinations.

Issues related to exploration of e-learning law:

- The exploration of the law of distance education and reform of talent cultivation modes needs to be enhanced.
- Teaching resources design, production, application and sharing need to be explored.
- Online interactive teaching and learning as well as related guidance need to be improved.
- Teacher input, guided learning and learning support services are inadequate. (Ding, 2005)

### *Development trends*

1. Positioning: distance education will inevitably transfer emphasis from higher degree education to serving the construction of a lifelong education system. (Ding, 2003a)
2. Technical development trend: teaching needs will lead technological development. Reforms of educational concepts and teaching methods will promote the development of distance education technology towards standardisation, practicality and intelligentisation. (Ding, 2003a)
3. The development trend of teaching modes and learning support services: personalising learning to meet the needs of distance teaching and 'state of separation' between students and teachers, promoting 'reintegrated' collaborative learning, flexible learning and blended learning will become the mainstream. Learning support service system will focus upon public services, standardise services and featured services towards diversification and multi-functions. (Ding, 2003a)
4. Quality and administration: the quality assurance system will be improved and transferred to administration of quality and efficiency; thereby achieving a new equilibrium in terms of quality and scale. (Ding, 2003b)

5. Disciplines, programmes and talent cultivation: absorbing nutrition from rich practice of distance education in China, distance education basic theory in China will be gradually improved. At the same time, the academic atmosphere is growing stronger and disciplinary construction will become more mature; talent cultivation and training in distance education programmes will be further standardised. (Ding, 2003a)

## Conclusion

Distance education in China, within a short span of 10 years, has made great achievements in the development of enterprise, programmes and its relationship with industry, theoretical research, practical exploration and talent cultivation, thereby opening up a new dimension of distance education in China. However, issues still exist in the exploration of laws, resource construction and sharing, and these deserve important concern. With the further development of pilot projects, the Chinese distance education industry will gradually enter a virtuous circle of innovative theoretical system, talent cultivation modes and services.

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