



5. ICT-Capacity Standards for Teachers in China

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Introduction

The use of information and communication technologies (ICT) in schools in China has seen significant growth in recent years as the Chinese government looks to establish education for all (EFA) in Chinese schools.

In 2004, a National Educational Technology Standard for Teachers, with ICT at its core, was issued in China. According to the standard, every teacher should master the necessary knowledge, skills and application ability of ICT. All teachers also need to receive training and pass assessments based on the standard.

This paper aims to introduce China's ICT-capacity standards and the areas in which teachers will be trained. The paper begins with an overview of the education reforms that have been implemented in China over the past 30 years, and introduces China's curriculum framework. Following this, the paper describes China's initiatives in terms of integrating ICT into school-level education. Finally, the paper discusses China's national educational technology standards for teachers and lists some of the activities being undertaken and some suggestions for changes.

Background

Numerous reforms have taken place within the Chinese educational system over the last 30 years. Since 1978, education in China has undergone significant reform and progress. For example, the 1985 "Decision on the Reform of the Educational Structure" made local governments responsible for basic education, while the 1993 "Guidelines for the Reform and Development of Education in China" set out the direction and policies for the development of basic education in China for the foreseeable future.

The concept of "five co-ordinations" was set up as the guiding principle to carry forward national education development: coordination between urban and rural; local and national benefits; between social and economic development; human and nature; international trade and domestic economy.

The education reforms led to the development of the compulsory education law. The "Compulsory Education Law of the Peoples Republic of China" has been implemented since 1986 and guarantees the right to at least nine years of education for school-age children (five years of primary and four years of secondary). The secondary schooling system in China is divided into three stages: primary education (five to six years); junior secondary (three to four years); and senior secondary (three years). Therefore the law provides for nine of the 12 years needed to complete secondary school in China. This law also provides a solid legal basis for basic education in China, thus establishing education as a key part of China's future.

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Education for All

The overall goal of China's compulsory education programme is to achieve education for all (EFA) throughout China, including in all the rural regions, by the end of 2007. The statistics show that this goal is not far from being achieved. At the end of 2005, the total enrolment rates for school age children were 99.3 percent for primary education and 85 percent for secondary education, with a total enrolment of 200 million children. Furthermore, 85 percent of the under-45 year olds are now literate and the percentage is expected to rise. By 2008 it is hoped that the nine-year compulsory education programme will cover all China and the entire 15 to 45 age group.

The nine-year compulsory education law has provided the catalyst for the introduction of further changes within the Chinese education system, namely the focus on integrating the use of ICT into schools. Compulsory education and thus increasing enrolment rates across the country have meant that the introduction of ICT into schools has consequently reached more students.

High Quality Education

As well as the EFA programme, the Chinese Government launched the National Curriculum Reform programme in 1999 with the goal of providing high quality education for all children. This was the most extensive educational reform seen in China since 1949. The main components of the National Curriculum Reform programme are outlined below.

- Curriculum objectives

To promote children's problem-solving ability, critical thinking, and the four pillars of learning: "learning to know, learning to do, learning to live together and learning to be".

- Curriculum structure

To focus on comprehensiveness of learning areas, balance between different areas and subjects, and thereby give students more flexible learning choices.

- Curriculum content

To relate students' learning to their daily experience, social development and technological innovation; to change the textbook-based content delivery process; to employ ICT to help students to get access to rich learning content.

- Teaching-learning approach

To encourage learner-centered teaching approaches, with teachers as facilitators and guides; to offer an ICT-enhanced interactive learning environment.

- Learning assessment

To change assessment differentiation and selectiveness function; to use assessment to monitor students' learning progress, and to diagnose the teaching process.

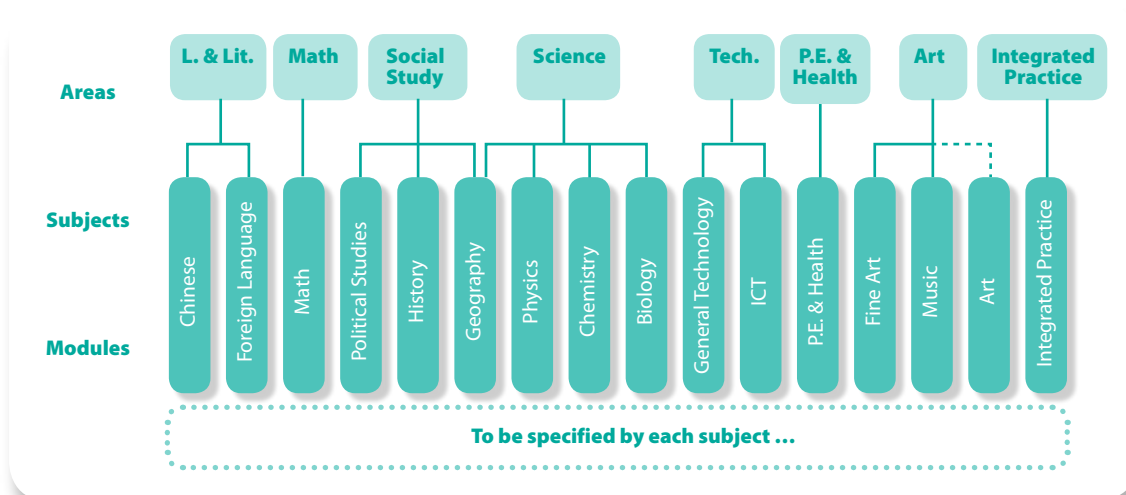
- Three-level curriculum management system

To decentralize curriculum management to provinces and schools; to respond to the diversified learning needs and different regions' cultural, economic, and educational differences. To empower schools with the capacity to develop and implement a school-based curriculum by assisting school-based action studies.

Figure 1: China's Curriculum Framework for Grades 1 to 9

	Grade									
	1	2	3	4	5	6	7	8	9	
Subjects	Morals & Life Skills		Morals & Social Studies				Morals & Social Studies			
							History & Social Studies			Option: History or Geography
			Science				Science			Option: : Biology, Ph. or Chem.
	Chinese Language									
	Math									
	X		Foreign Language							
	Physical Education and Health									
	Art (Music or Fine Art)									
	X		X		ICT					
	X		X		Integrated Practice (including Technology, Inquiry-Based Learning Activities & Community Service)					
	Local & School-Based Curriculum									

Figure 2: China's Curriculum Framework for Grades 9 to 12

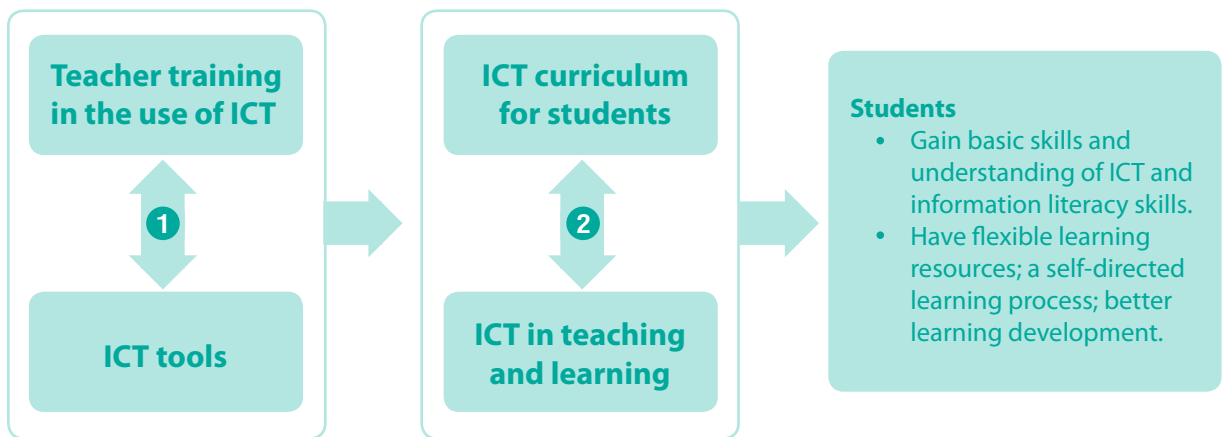


ICT in Schools

The Chinese Government recognizes the tremendous potential that ICT hold for enhancing education. The Government believes that technology and information literacy are essential, not only for youth to improve in their learning activities, but to adapt themselves to a more technology-based life, and to be prepared for future working environments.

The adoption of ICT in K-12 schools in China is a systematic project as shown in Figure 3, below. Based on the structural framework, the Chinese Ministry of Education (MOE) has been launching a series of initiatives to accelerate training in ICT tools and increase ICT use in schools.

Figure 3: Structural Framework of ICT in China K-12 Schools



① Provision of necessary ICT tools and resources for teachers to use to improve their ICT skills and to utilize to produce better learning outcomes.

② An ICT training course (curriculum) enables students' to develop the necessary ICT skills for participation in modern knowledge societies. Using these skills in various subject areas at school will provide a real-world context in which students can practice and apply their ICT skills.

ICT in Education Initiatives

The National Distance Learning Programme for All Rural Schools (2003 -2007) was launched in 2003 and will run until the end of 2007. The initiative will invest 10 billion RMB (US\$1.25 billion) in providing rural schools with ICT facilities and educational resources, benefiting some 160 million rural children.

The supply of these ICT tools is intended to assist in closing the education-quality gap that currently exists between rural and urban regions. As part of the initiative, the Chinese Government will continuously collect good quality educational resources from well-developed urban regions and transmit them to rural areas via the Internet, satellites or in DVD and CD-ROM format.

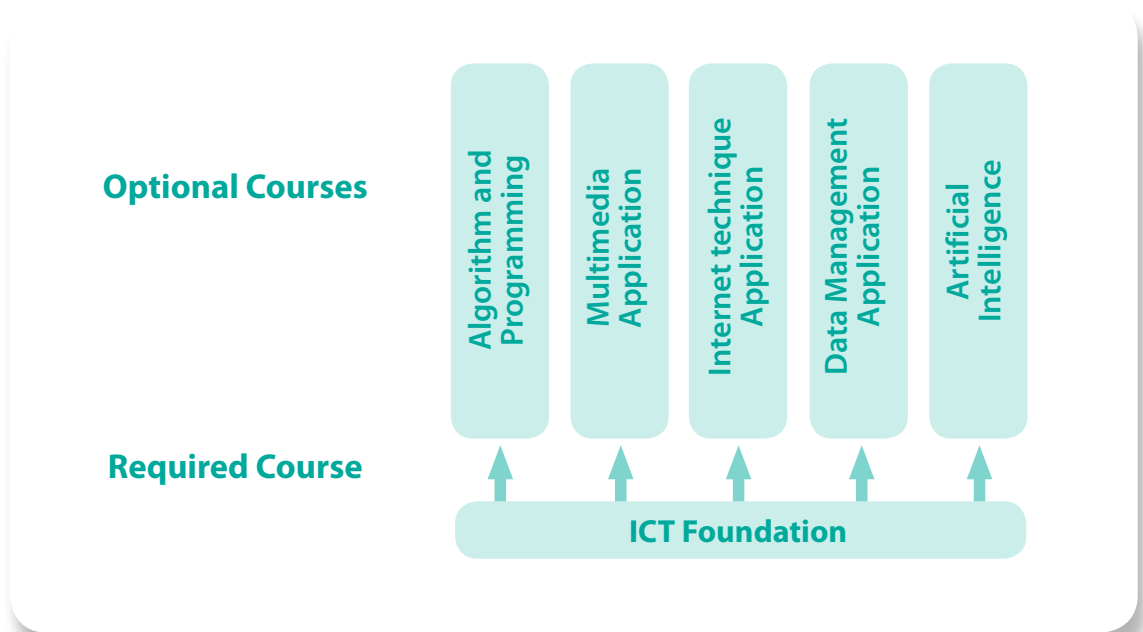
Rural schools will be equipped with different sets of ICT tools depending on their location, level and needs. Three models exist, as outlined below.

- Model One: 110,000 village classes will be equipped with a TV set, a CD-ROM and DVD player, and a set of curriculum materials (available on CD-ROMs).
- Model Two: 380,000 rural primary schools will be equipped with TV sets, CD-ROM and DVD players, a set of curriculum materials (CD-ROMs), and satellite receiving facilities.
- Model Three: 40,000 rural lower-secondary schools will be equipped with the tools in Model One and Model Two, as well as computer labs and Internet connection.

ICT in the National Curriculum

Within the new curriculum framework, ICT has been set as a required course from Grades 3 to 12. The ICT curriculum is designed to provide an opportunity for pupils to learn basic computer skills, and to employ tools to find, explore, analyse, exchange and present information. During this process, teachers are expected to assist students to increase their capacity to use computers and teachers are expected to utilize the ICT tools in the classroom to promote initiative and independent learning among students. By using ICT in this way, both teachers and students will develop the ability to make informed judgment about when and where to use ICT best. For primary and lower secondary schools, the computer-skills curriculum focuses mainly on enabling students to gain the skills and understanding required to use common application software. China's ICT curriculum structure for upper secondary schools is as outlined in diagram 4 below.

Diagram 4: The upper-secondary school ICT curriculum



National Education Technology Standards

According to the “National Education Initiatives for 2003-2007”, all classroom teachers, along with school administrators and school technical coordinators of K-12 schools should receive effective training in the use of ICT in education by the end of 2007.

To ensure the relevance and quality of the training and to develop performance indicators for teacher preparation, the China Educational Technology Standards (CETS) was developed. Issued in September 2004 (Teachers [2004]No. 9), the standards set up three types of standards, one for teachers, one for administrators and one for technical coordinators of K-12 schools.

Standards for Teachers

The Standards for Teachers are divided into two areas of activity:

A. Digital Resources Development and Sharing

- The Government developed “Meta-Data Standards for Digital Resources Development and Exchange”.
- A national digital learning resource database based on the national curriculum has been designed and shared freely through on-line portals, such as, the China Basic Educational Resources Network (<http://www.cbern.gov.cn>), the China Educational Resources and Service Portal (<http://www.cersp.com>).
- Dedicated satellite channels deliver learning materials to schools regularly and freely.
- Every province has established a local, dedicated, educational website.

B. Integration of ICT into teaching and learning

- Teachers are encouraged to facilitate extensive use of ICT by students in inquiry-based classroom learning activities.
- Since 2001, a national programme on ICT for Teaching and Learning has been in effect.

Areas of Training

According to the Standards, all classroom teachers should be prepared or trained in four areas. Each area of training has its own performance indicators.

1. Awareness and attitude

- **Awareness of technology’s value**

Teachers should be aware:

- Of the potential of technology to promote educational reform.
- That the ability to apply technology appropriately is one of the necessary skills for a good-quality teacher.
- Of the value of applying technology effectively for enhancing the teaching process and cultivating innovative teachers.

- **Self-Assessment**

Teachers should be able to evaluate themselves on:

- Use of technology for delivering teaching materials.

- Implementing a technology-enhanced teaching process.
- Effectiveness and efficacy of technology-enhanced teaching.

- **Concepts of lifelong learning**

Teachers should be able to demonstrate the ability to:

- Learn and re-learn about emerging technology over time.
- Use technology to support life long learning, professional development, and personal life.

2. Knowledge and skills

- **Concepts**

Teachers must demonstrate an understanding of:

- Commonly-used technology.
- Fundamental educational technology theories.
- Educational technology methodologies.

- **Skills**

Teachers should master the skills of:

- Information searching, processing and presenting.
- Selecting and developing teaching media.
- Designing a technology-enhanced instructional system.
- Managing teaching materials, the teaching process, and learning projects.
- Evaluating teaching media, teaching materials, the teaching process and teaching outcomes.

3. Implementation and innovation

- **Designing and implementing technology-supported lessons and activities**

Teachers should be able to:

- Describe teaching objectives, analyse teaching content appropriately, and design teaching activities appropriate to students' characteristics and local situations.
- Explore effective technology-enhanced instructional strategies.
- Design and create technology-enhanced learning environment for students and provide guidance.
- Apply technology to support assessment.

- **Using technology to support teaching and management**

Teachers should be able to:

- Identify, locate and collect technology and information resources of high relevance to the curriculum.
- Use technology to manage resources effectively.
- Use technology to monitor students and manage the diverse learning activities effectively.
- Use technology to manage the instructional process.

- **Using technology to enhance research and professional development**

Teachers should be able to:

- Use technology to support subject-specific research.
- Identify and implement studies of technology application.

- Use technological tools to enhance their in ongoing professional development and lifelong learning.

- **Using technology to mediate collaboration and communication**

Teachers should be able to use technology to communicate:

- With students, about learning activities.
- With parents, to update them on students' performance.
- With peers on teaching ideas, materials and research.
- With administrators of different levels, about management.
- With technicians in fields such as courseware design, media selection and development.
- With experts to ask for professional assistance.

4. Social responsibilities

It is important for teachers to understand the social, ethical, legal, and human issues surrounding the use of technology in schools and apply that understanding in practice. Teachers should be in a position to:

- Apply technology equitably: facilitate students of different genders and economic status to have equitable access to technology resources in classrooms.
- Apply technology resources effectively: enable and empower learners with diverse backgrounds, characteristics, and abilities.
- Apply technology resources appropriately: guide safe use of technology resources.
- Demonstrate good practice: model and teach legal and ethical practice related to technology use.

Implementation Activities

The Ministry of Education (MOE) will undertake a number of activities related to establishing the Standards. These include:

- Creation of a systematic content framework to guide the preparation of training modules. Two series of training modules have been completed and have met the MOE's requirements.
- Provision of suggested training methods of proven effectiveness, to promote ongoing training activities and to ensure training is of a high quality. Teacher Education Institutes (TEIs) and Teacher Training Institutes (TTIs) that meet the standards will be selected as core training centres. Peer coaching and co-operative instructional design will be encouraged in teacher education.
- Development of assessment indicators as tools to evaluate teachers' post-training performance. Standard assessment tools have been designed and the evaluation system for the standards has been developed. All trained teachers will be tested using the system and various levels of grades will be given. Teachers will identify whether they should receive further training and what training they require.

Recommendations

A number of changes are recommended in order to improve the Standards for Teachers, as listed below.

- Refine Standards suit local needs and conditions

The CETS were based mainly on the American National Educational Technology Standards (NETS for Teachers, Students, and Administrators). To ensure their suitability for local needs and conditions, the CETS may need to be localized further.

- Develop better indicators

The Standards advocate learner-centred approaches but the indicators do not adequately measure these approaches. Furthermore, while the indicators measure teachers' direct performance, they do not necessarily measure teachers' use of technology to facilitate students' learning. For example, standards are mainly described as "using technology to support the teaching process", instead of "using technology to support learner-centred strategies that address the diverse needs of students".

- Identify various standards depending on teachers' levels of ICT competency

The existing Standards go beyond most Chinese classroom teachers' existing technology level. Teachers will lose confidence, however, if they feel the standards are unachievable. Various levels should be identified for the Standards, such as introductory level, medium level, and expert level.