

The Development and Applications of eLearning Technology Standards in China

Zhu Zhiting

Educational Information Center,
East China Normal University,
3663 N. Zhongshan Road
Shanghai, China 200062
ztzhu@dec.ecnu.edu.cn

Abstract

eLearning in China is developing rapidly. Until now, 68 universities were approved to run distance education on a basis of eLearning. Besides, over 200 cyber-schools at basic education level are in existence. As a variety of technological specifications are used in developing platforms and online courseware, a lot of problems exist with resources sharing and system interoperations. The rapid development of eLearning rises a great demand on the use of a consistent set of standards. This paper describes the efforts made in China to create a comprehensive framework of eLearning technology standards. After an introduction to the background for the prosperity of cyber-education in China, this paper focuses on describing the efforts made by Chinese eLearning Technology Standardization Committee (CELTSC) in developing eLearning relevant standards. The architectural framework of Chinese eLearning technology standards will be presented and the profile of standardization projects will be described, followed by an introduction to activities carried out by CELTSC to promote applications of the standards.

1 Rapid Growth of Cyber-Education in China

Cyber-education represents a brand new form of education in which instructional and management activities are carried out mainly based on eLearning technologies. Cyber-education has been growing rapidly in China since the late 1990s, especially in the fields of higher education and basic education. Higher educational institutions in China are currently encountering a high pressure onto their schooling capacity due to an increasing population of education pursuers. Cyber-education is considered as a fast and economic approach to ease the pressure. In September 1998, the MOE started to grant special licenses to Tsinghua University, Beijing Post and Telecommunication University, Zhejiang University, and Hunan University as the first set of higher educational institutions pioneering cyber-education. In 1999, Beijing University and the Central Broadcast and Television University were added to the pioneer list. Stimulated by favorable policies, a considerable number of Chinese universities started to invest in Cyber-education since then. At the end of 2002, up to 67 universities in China have received cyber-education licenses. It is

estimated that over 1.6 millions of students are enrolled in these cyber-education institutions, involved in 140 specialties from 10 academic disciplines. Besides, the Central TV University which has over 2 million of students enrollment is moving to cyber-education (Zhu, Gu & Wang, 2003).

In basic education, cyber-education is also growing rapidly both outside schools and inside schools. The unbalanced distributions of educational resources and the large differences of educational qualities among different districts in China have triggered the emergence of cyber-schools (Ma, 2001). It is estimated that there have been some 200 cyber schools in China, which are mainly sponsored by enterprises in combination with some famous schools. The total enrollment in these cyber-schools has reached over 600 thousand learners (Zhang, 2002). For example, in Beijing alone, there are more than 30 cyber schools such as the 101 Cyber-School (<http://www.chinaedu.com/>), the Jingshan Cyber-School (<http://www.jsedu.net/>), and the Hope Cyber-School (<http://www.hoho.edu.cn/>). The cyber-schools usually offer i) online lecturing; ii) answering questions by excellent teachers; iii) online practice; and iv) analyzing of test results. The students are from regular schools and take part in the online learning at their own home. Most parents of the enrolled students expect that their children can learn more from the excellent teachers of cyber-schools in order to ensure their entry into universities in the future.

Furthermore, with the rapid growth of the Internet applications, campus networks in schools are becoming increasingly essential and significant for regular schools since they can provide learners as well as teachers with more flexibilities in accessing instructional

resources. In addition, campus networks have the potentials to make the school management more efficient. Up to 2003, more than 45 thousand campus networks were found in primary and secondary schools. However, it is just a small portion out of 670 thousand schools in total in China.

2 Developing eLearning technology standards

Hundreds of ICT companies are competing in the Chinese eLearning market. Consequently, eLearning products developed by various educational companies encounter difficulties in resources sharing and systems interoperating due to the use of variant technology specifications. This situation creates a strong demand for the adoption of consistent eLearning standards. In 2001, the China eLearning Technology Standardization Committee (CELTSC) was established, which consists of educational technologists and ICT experts from eight key universities. Approved by China National Administration of Standards in December of 2003, the CELTSC has become a branch of National Committee of Information Technology Standardization.

Based on a comprehensive study of international developments in the field of eLearning standardization, the CELTSC has created a framework for Chinese eLearning technology standards [Zhu, 2001] as illustrated by Figure 1, in which 29 target standards are included. Majority of these items can find correspondents in IEEE 1484.

For further information regarding the CELTSC and the project please refer to the web site [<http://www.celtsc.edu.cn/>].

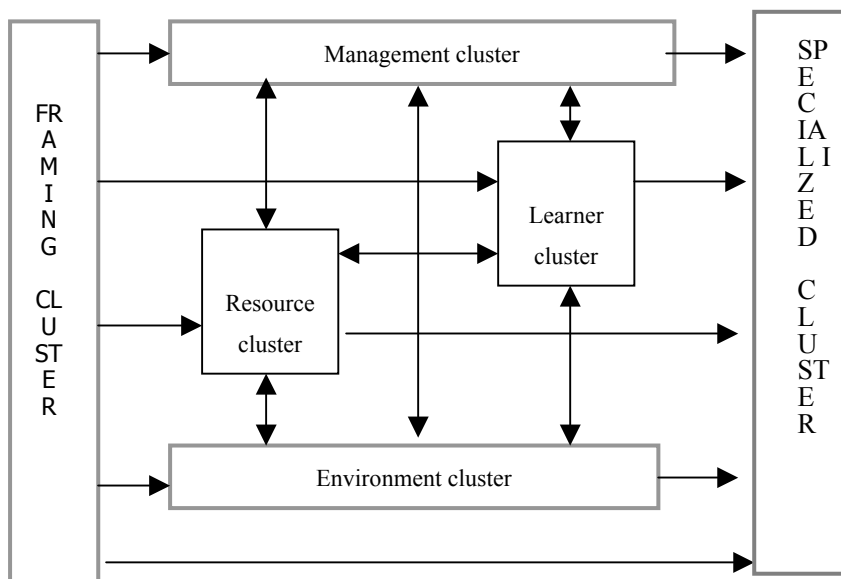


Figure 1 The architectural framework of Chinese ELearning Technology Standards

Conceptually, the architectural framework consists of 6 clusters of standards (see Table 1):

Table 1 Standardization projects in the body of CELTS

	General-purposed standards	Specialized cluster
Framing cluster	Architectural model(CELTS-1)***	
	Terminology(CELTS-2)***	
	XML banding rules(CELTS-4)***	
	Localization regulations(CELTS-25)**	
	Upper ontology(CELTS-28)*	
Resource cluster	Learning object metadata(CELTS-3)***	Specification for Learning resource base in higher education(CELTS-41)**
		Specification learning resource metadata for basic education(CELTS-42)**
	Course sequencing(CELTS-8)**	
	Content packaging(CELTS-9)***	
	Test & question interoperation(CELTS-10)***	
	Content rating(CELTS-29)**	
Learner cluster	Learner model(CELTS-11)***	
	Student identification(CELTS-13)***	

	Competency definition(CELTS-14)*	
	Lifelong learning profile(CELTS-15)*	
Environment cluster	Platform/media standards profile (CELTS-17)***	
	Enterprise interface(CELTS-19)**	
	Learning management(CELTS-20)***	
	Collaborative learning(CELTS-16)*	
	Tools/agents communication(CELTS-18)*	
	Virtual experiment(CELTS-26)*	
	Adaptive learning(CELTS-27)*	
Management cluster	Web-based curriculum evaluation (CELTS-22)**	
	Learning environment evaluation (CELTS-23)*	
	Learning service quality management (CELTS-24)**	
	Educational management information (CELTS-30)**	Educational management information interoperation framework (CELTS-40) *

Notes: *** These standards have entered the program of national standards

** These standards are at the stage of draft review or have been approved by CELTSC

* These standards are in the way of development.

- Framing cluster involves standards describing the architectural framework, terminology, XML banding rules and localization regulations;
- Resource cluster involves standards prescribing learning object metadata, course sequencing, content packaging, test & question interoperation and content rating regulations.
- Learner cluster involves standards prescribing learner model, student identification, competency definition, and lifelong learning profile.
- Environment cluster involves standards prescribing platform/media standards profile, enterprise interface, learning management, collaborative learning, tools/agents communication, virtual experiment, and adaptive learning.
- Management cluster involves standards prescribing web-based curriculum evaluation, learning environment evaluation, learning service quality management, and data formation of educational management information.
- Specialized cluster involves specifications that are derived from other clusters of standards through localization or instantiation efforts in subject to the framing cluster of standards.

3 Prompting applications of eLearning standards

The CELTSC is exerting efforts on promoting applications of published standards through offering three types of

services:

- Testing & certifying services: A set of benchmark tools has been developed for testing conformance of educational software products against seven published standards. CELTSC has entrusted China Software Testing Center to offer testing services temporarily. In the long term, an independent testing center should be created. Since April of 2004, a number of software products have passed through conformance testing against relevant CELTS standards.
- Training services: During 2002, the CELTSC have held three training sessions on the use of eLearning standards. About 200 persons from companies and universities participated in the training.
- Consulting services: The CELTSC experts keep close contacts with users of standards and offer advices regarding implemental issues of standards.

A latest measure adopted by CELTSC is to offer memberships to enterprises that are willing to contribute to the development and applications of standards, which has drawn interests from over 20 enterprises.

References

- Ma, N. (2001). A report of the online schools and universities in China. <http://www.online-edu.org/article/article/57.html>
- The MOE. (2001). "The situation of online education in the pioneer higher educational institutes." <http://www.edu.cn/20010912/3001187.shtml>
- Zhang, R. (2002). "How to select a cyber school in China?" <http://www.cnii.com.cn/20020228/ca30549.htm>
- Zhu, Z.T, Gu, X.Q., & Wang, Q.Y. (2003). "A panorama of online education in China", *Educational Technology*, XLIII, No.3.
- Zhu, Z.T.(2001). "The architecture of Chinese eLearning technology standards", *CELTSC work report*.