

# Developing an Accreditation System for On-line Teaching Processes

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## Abstract

In order to improve on-line education, the Chinese government launched a state level project "Developing an Accreditation System for On-line Education" in 2002. The system for accrediting quality of on-line education includes three components: an accreditation system for on-line education institute, an accreditation system for college major, and an accreditation system for on-line course. Because the quality of an on-line course depends on both the courseware and the on-line teaching process, the assessment scheme of these two aspects would be developed individually. This paper is a research report examining the methodology, the process and the result on developing an accreditation system for on-line teaching process.

The research experienced four stages, including literature reviews, accreditation system development, case studies, and final revision. The research adopted the PDCA (Plan-Do-Check-Act) which is an effective method used to develop all kinds of quality assurance system in ISO 9000 standards. After final revision, a new accreditation system for on-line teaching process is comprised of 19 items from 4 dimensions: course preparation, learning management, learning support and learning evaluation.

The accreditation system had been employed as guideline for developing on-line teaching process of a graduate course "Collaborative Learning" and an undergraduate course "Multimedia Technology". The higher student satisfaction degree and student exam scores proved that this system is effective in improving quality for on-line course and teaching.

While provides a guideline for improving web-based teaching, the research result can be one of the important parts of the accreditation system for online education.

## 1. Accreditation for On-line Education Quality

Aiming to improve on-line education by more normative management and evaluation, the Chinese government launched a state level project "Developing an Accreditation System for On-line Education" in 2002. The system for accrediting quality of on-line education includes three components: an accreditation system for on-line education institute, an accreditation system for college major, and an accreditation system for on-line course.

Accreditation system for on-line education institute includes certification for on-line education pilot institutes and learning centers. The former mainly refers to recruitment, teacher, institute organization, major, curriculum, hardware, learning center management, service promise, and so on, while the later mainly includes basic condition of learning center, tutorship, instruction arrangement, auxiliary instruction information, library materials, etc, aiming to standardize on-line education institute and improve on-line education quality.

The accreditation system for college major focuses on whether on-line education institute possesses the condition to open a major to ensure the instruction quality.

The accreditation system for on-line course focuses on the quality of on-line courseware and

teaching process. The teaching process will be discussed in this paper.

## **2. Certification Standard for On-line Curriculum**

The basic unit of on-line education is on-line curriculum, which includes on-line instruction resource and process. In on-line curriculum, instruction resource is the representation of instruction content, while the teaching process is a series of teaching activities which are organized by strategies in order to achieve a particular instruction goal. Since on-line courseware at a certain extent belongs to production, the on-line instruction resource and process would be researched individually.

### **2.1 The Research for On-line Courseware Accreditation**

The project team not only researches the achievement of CAI in China these years, but also invests widely abroad the evaluation and certification standards, which includes:

- I “Chinese Learning Machine Software Evaluation Standard”, the first national education software evaluation standard at the end of 1980s;
- I “Multimedia courseware evaluation standard” by South China Normal University and Hong Kong Science & education Association at the end of 1990s;
- I “Education certification standard” by the Production Popularization Center of National Education Technology Consortium In 2000;
- I “E-learning Certification Standard” by America Instructional Design Committee;
- I “E-learning Courseware Certification” by America Association of Training and Developing.

The Certification Standards for on-line Courseware is the first certification standard for on-line courseware which is constituted through four steps: investigation, expert discussion and experiment and finally formed. This standard includes 6 components (instructional design, teaching content, and usability, technologic, presentation of information and document materials), 33 scales and 51 indexes. This standard was utilized in the certification of “New-century On-line Courseware” which were organized by Ministry of Education(MOE) and played important role in certification, receiving consistent affirmation of experts and teaching staff.

### **2.2 The Research for On-line Teaching Process Accreditation**

In order to research the on-line instruction process, the project team reviewed a large number of national and international literatures, including quality requirements, guidelines and standards. A few typical quality standards are as follows:

- I “Quality on the Line: Benchmarks of Success in Internet-Based Distance Education” by Institutes of Higher Education Policy of United State (IHEP);
- I “Distance Education• Guidelines for Good Practice” by America Foundation of Teachers (AFT);
- I “Distance Learning Guidelines” by Higher Education Quantity Assurance Association of Great Britain (QAA);
- I “Standards in Open & Distance Learning” by Opening and Distance Learning Quantity Council of Great Britain (ODL QC);
- I “Educational Quality Assurance Model” by Korean National Open University (KNOU):.

In Chinese literature review, project team mainly reviewed relative quality management document of Central Radio and TV University, and policy documents about adult & correspondence of MOE and some experts'views.

According to international common methods, project team considered basic components of on-line instruction (teacher, student, instruction resource, instruction activities, instruction strategy, learning support and network learning platform) as the primary indexes of accreditation, and further establish 52

secondary indexes and 144 third-level indexes.

In the research of instruction process, based on the analysis of the influences caused by culture differences between eastern and western, researchers deemed that the main purpose of certification is to improve key taches of network teaching process, and further standardize the arrangement and management of teaching process. Factors of staff involved in teaching process were not considered as independent factor of certification. The content researching on staff is their representations and behaviors; the more importance is the teaching effect.

### 3. Analyzing On-line Teaching Process by PDCA Method

ISO 9000 international standard encourages “process” method to be adopted to establish and operate quantity management. In order to operate the whole system efficiently, correlative activities and process must be identified and managed. In generally way, one process’ output directly forms the next process’ input. The PDCA method as a common method fit for process management is an effective method used to develop all kinds of quality assurance system in ISO 9000 standards. PDCA can be supplyly understood as:

P (Plan): include 5 steps: analyzing present condition, finding out reason of problem, analyzing reason, finding out main reason, making plan, predicting efficiency;

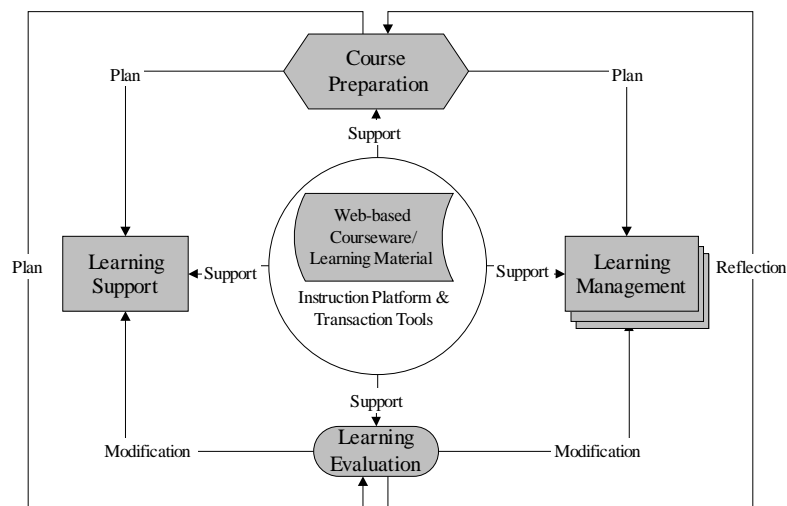
D (Do): executing as plan or rules;

C (Check): comparing the result and goal to check whether the executing situation achieve the goal;

A (Act): consolidating the achievement; taking the successful experience into standard and transferring the problems left into next circle.

As a concrete form of ordinary learning process, on-line teaching process is characterized by that the instructor and learner are separated by distance and time. It is an instruction process that realizes instruction goals with communication by Internet, videoconference, and so on. Four key taches of on-line instruction are: Course Preparation, Learning Management, Learning Support and Learning Evaluation, as being shown in figure 1. The Course Preparation responds to P (Plan), the Learning Management and Learning Support responds to D (Do), the Learning Evaluation responds to C (Check), while Modification and Reflection respond to A (Act).

**Figure 1: PASE Mode of Network Teaching Process**



As four key taches of on-line teaching process are sub-processes which are independent but relative with each other, method of PDCA is required and feasible to guide and evaluate each tache.

## **Course Preparation**

It is the preparation phase of the on-line teaching process, which includes teacher preparation, student preparation and learning material preparation.

- I Plan: forming the teaching personnel & staff according to the student number, developing the teaching plan, and preparing teaching resource for the course;
- I Do: communicate with students about learning problems through synchronous or asynchronous teaching mode, including learning method, learning strategy, learning motivation, teaching outline, teaching activity plan and evaluation;
- I Check: investigate students about learning motivation, learning skill, mentality preparation; collect responsive advice about teaching plan announced in advance;
- I Act: arrange necessary training about learning strategy and method according to actual instance; update necessary on-line teaching resources; get consistent self-identity about teaching plan, and do necessary modification about the arrangement.

## **Learning Management**

Learning management is the main body of on-line teaching process, which is composed of series of learning activities, and vary from course to course. The teaching personnel should adopt certain means and methods promoting the student learning performance, mainly behaving in self-management of learning process and initiative asking for helps when encounter difficulties and matters. At the same time, paying more and persistent attention to students' rate of learning progress and behaviors, and keeping students appropriate anxiety will be good for successful learning.

- I Plan: according to teaching plan, teaching content and learners, select proper teaching model for every learning unit; set up necessary learning tasks, and establish learning groups according to them;
- I Do: post every unit learning activity plan, and open correlation resources, declare the group list for group learning, and pay more attention to student learning status; explain students' questions and problems in regulate time, especially those common existence among students; make feedback on students' exercise in time, make remarks on part of exercise in detail, and declare keys and solutions about those exercise in detail;
- I Check: collect common existence problems among students; appraise learning activities' performance, find those needed improvement; be aware of every student's status reflecting from learning activity and exercise in this unit;
- I Act: compile teaching document and summarize existent problems; design amendment and remediation schemes, and use them in next learning units and teaching activities.

## **Learning Support**

In on-line teaching process, the role of learning support is to help the students cope with academic or unacademic difficulties he may encounter including the following difficulties: learning skill difficulties, interactive communication obstacles and individual difficulties. This service has impact on the whole on-line teaching process and plays a key role in the accomplishment of the student's learning.

- I Plan: according to inherent experiences, FAQ, learning strategy and method, and IT operation skill, establish learning support web site; set up learning support system, including personnel arrangement, correspondence method, learning feedback method;

- I Do: periodically inquiry the student learning problem they encountered, and provide individual helps; arrange personnel specially assigned for the students' individual help, and insure other correspondence method besides network communication can be effective;
- I Check: periodically check learning support service records, and find existent problems; establish learning documents for every student, including the problems during learning management, analyses student learning status and learning rate of progress;
- I Act: periodically update learning support site; track student learning records, provide more helps for students which need special helps; periodically inquiry students who hardly asked questions, and pay attention to students' learning status.

### Learning Evaluation

Learning evaluation in on-line teaching process consists of student's evaluation and course evaluation. Presently, it is usually a kind of summative evaluation, the final term's evaluation for student and a survey to evaluate the teaching efficiency. Strictly speaking, evaluation's main goal is to give a directional opinion to students, and help them achieve further aims. Consequently, in on-line teaching process there is a reciprocal combination between summative evaluation and formative evaluation.

- I Plan: according to teaching plan, set up learning evaluation step, method and approach; make sure the evaluation content, evaluation standard and analyses method of formative evaluation and summative evaluation;
- I Do: the evaluation for student should be comprised of quantitative evaluation and qualitative evaluation (e.g. portfolio evaluation), and calculate student grade according to a certain of power; the evaluation for course is mainly through student satisfaction survey, including five parts, such as interaction degree between teachers and students, exercises and answer-question, learning management, learning material provision and students' examination situation;
- I Check: analyses evaluation results, find the problems exist in learning and course implementation, and also including the problems in course evaluation;
- I Act: design necessary amendment measures according to existent problems, and make summarizations and reflections about course implementation.

## 4. Accreditation Standard for On-line Teaching Process

The main task of accreditation of on-line teaching process is to analyze whether main aches in teaching process are corresponded to requirement. Therefore, four key taches can be considered as important evaluating contents of accreditation standard for on-line teaching process. The standard for on-line teaching process is shown as table 1.

Table 1: Accreditation Standard for On-line Teaching Process

Primary index	Secondary index	Third level of indexj	Notesk
Course Preparation	Faculty	Personnel Composition	Definite personnel are arranged with responsibility for lecturing, tutoring and technology support of courses; average 40 students must have a tutor.
		Teaching Plan	Syllabus, teaching materials and web-based courses are published a month advanced.
		Content Renewal	Teacher group updates learning resources
	Student	Learning Skill	Definite measures are taken to analyze web learning skills of students and their comprehension of course objective; appropriate training is needed as well.

	Teaching Resources	Teaching Resources	Quality requirement of Web-based courseware refers to "Certification Standards for Web-based Courseware"
Learning Management	Teaching Activities	Frequency of asynchronous communication	In teaching process of a semester, teacher group should send at least 3 E-mails to every student or join in students' discussion 3 times.
		Frequency of synchronous communication	In teaching process of a semester, lecturer answers students' questions synchronously at least 3 times.
		Requirement of Assignment review	Assignment quantity and requirement must be included in instruction, key of assignment being timely published; in a semester, a student gets careful review of assignments from their teacher at least once.
	Management of Teaching	Implement of Course Plan	Teachers finish all teaching content and give explications of modification.
		Compilation of Teaching Documents	Teacher creates his teaching document in the teaching process, enabling to reflect situation of students and review what measures teacher takes.
		Teaching Mode	According to course content, teaching modes such as self-study, collaborative learning and collective learning are appropriately applied.
Learning Support	Learning Support Environment	Necessary Learning Support	In the web site of learning support environment, interactive tools are provided, such as e-mail, BBS, message board ,etc.
	Learning Monitoring Personnel	Auxiliary Personnel	Besides teacher group as before, psychological counseling teachers, online service teachers are included.
	Support Range	Learning Tutorship	E-mail address of course tutorship is published, feedback of answers being made in 24 hours.(Besides direct answer, it includes answers such as "this question will be interpreted in discussion group next week" )
		Learning Technology	E-mail address of technology service is published, inquiry being responded in 24 hours.
		Complaint Response	E-mail address of complaint response is published, questions being replied to in 24 hours.
		Psychology Adjustment	Guidance on psychological problems, such as motivation, anxiety alleviation, and so forth, is provided.
Learning Evaluation	Tests and Assessment for Students	Assessment Methods	Students' grade includes at least 3 parts: usual assignments, performance of communication by way of network with students& teachers, mid examination or /and final examination.
	Assessment Activities of Course	Satisfactory Degree of Students	Dispatch, collect and gather the form of "assessment table of E-learning" and seek solutions to solve the problems.

Note:

- All indexes need to be proved by documents.
- Data of this table in detail need further research.

## 5. Case Analysis

During the trail experiment phase of this project, researchers selected two on-line courses; one was **Collaborative Learning** for education technology major's graduate freshmen (the teaching time is Sep. 2002 till Jan. 2003), the other was **Multimedia Technology** for computer science major's undergraduate juniors (the teaching time is Mar. 2003 till Jul. 2003).

There are distinct difference among two course learners (the former is graduate having good self-study ability and high independence, the later is undergraduate having basic self-study ability and being more dependent on teacher), and course content character (the former lays particular stress on

academic and investigative content, the later does technological and practical content), so the actual adopted measures in these courses and trial analytical results were different. But in respect of the final teaching effect, there was satisfaction result for these two courses.

During these two courses teaching, researchers all adopted WebCL collaborative learning network platform (URL: <http://www.webcl.net.cn>) which is mainly fit for running on-line collaborative learning activities, and provides learning management and learning support function. The implementation of these two courses closely catches hold of the four taches of on-line teaching process. By using PDCA method, we completed every key task and these two courses got success in some degree.

## **Course Preparation**

The learner must meet certain of requirements before beginning the learning through web-based course. In the course preparation phase of these two courses, teaching personnel acquainted with students' on-line learning skills, including sending and receiving E-mail, uploading and downloading files and documents, using communication tools (e.g. BBS and newsgroup), using searching engine. Before learning course formally, researchers introduced on-line learning skill to students face to face.

It is the fact that there is difference existence in learning skill for undergraduate, researchers investigated those juniors' learning strategy level who taked as an elective course by using the Learning And Study Strategies Inventory (LASSI). The survey result indicated that those students' learning motivation level was on the low side, and other factors differed obviously. By further analysis about those data, there was distinct positive relativity between students' performance of specialty basic courses and learning strategy appliance level. Considering above problems, the teaching personnel designed series of teaching activities to prompt students' learning strategy according to their learning strategy level in the instruction design, and established relative e-portfolio to record the basic instance of students' participation in learning activities, their production and writing, aiming at reflecting their real learning status.

In order to make students acquaint themselves with course content and set down rational learning plan on their time and arrangement, the teaching personnel communicate with students face to face about the learning object, learning method, time arrangement, learning stress, reference resources, topic exercise and exam requirement. Thanks to the learning activity was based on collaborative learning platform, there is operation method training about WebCL platform involved.

## **Learning management**

There are face to face collective instructions and on-line collaborative learning activities together during the teacing process. In order to guarantee quality of on-line teaching, teaching personnel pay more attention to the students, keeping frequency cooperation and communication. The tutors initivatively sent E-mail to students, asking for their status and problems, and set a fixed on-line tutorial time on the platform.

The coverage percent of inspection for students' exercise was keeping a certion rate; teachers issued the detailed keys and solution of the exercise in time, and commented the ordinary problems. There was special time for students to report their group tasks every times; the tutor would give the student appraisalment and judg the excellence groups and model individuals which would inspire the studens' learning enthusiasm.

In order to record students' status and solve those problems in time, teachers and tutors all had established teaching process documents every instruction, which was important to improvement

teaching measures.

### **Learning Support**

The WebCL collaborative platform for teaching provides multi-interactive methods such as E-mail, on-line discuss, BBS. In order to put questions to the teachers more conveniently, the E-mail addresses such as preside teachers, tutors and technology supporters (here is the platform developers, the members of Lab of E-learning, Beijing Normal University) were posted on the website, and the students' questions were feed back by E-mail, telephone, WebCL, and other methods in time. At the same time, we provided psychologic consultation in order to relax their anxiety mood, and inspire learning motivation by QQ (a popular C/S model chat software in China), helping them foster and form the collaborative atmosphere and consciousness.

### **Learning Evaluation**

Two course evaluations all adopted student satisfaction survey and student performance evaluation. The student performance evaluation included three parts: daily tasks, communication performance between teachers and students, and final test achievement. Student satisfaction survey was mainly through on-line learning evaluation table, which includes the attitude of teacher group (the confidence and favour to the teacher group), instruction process, assigned tasks, learning guidance, learning help and the test result

The results of on-line teaching process indicated that these practice of on-line courses implementation grasping the four taches of on-line teaching process and using PDCA method in teaching was successful.

## **6. Conclusion**

The quality of on-line learning is affected by on-line courseware and on-line teaching process. Accreditation of on-line courseware belongs to production level, and accreditation of on-line teaching process belongs to process level. ISO 9000 provides us a common quality management system, the PDCA method is included, According as PDCA method, grasping the four key taches of on-line teaching process, we establish a suit of accreditation system for on-line teaching process, aiming at persistent improving the teaching quality, which will be in favor of winning the trust of people. Promoting the accreditation about on-line teaching process is the approach to enhance management level and service quality of on-line learning, and then acquire international certification. This project of on-line course quality accreditation in level of network education unit will be a significant effect for Chinese education development.

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## Biography

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