THE STUDY AND PRACTICE OF WEB-BASED LEARNING ASSESSMENT IN OPEN AND DISTANCE EDUCATION

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ABSTRACT

Learning assessment is defined as assessment and evaluation of the learners' learning activities, process and outcomes. In recent years, as the Internet access is increasingly available, a majority of distance education providers in China have succeeded in delivering programs and support services through modern communications technology, in particular, the Internet. However, as far as the education assessment mode is concerned, the conventional paper-pencil test or end-of-course assessment is still overwhelmingly employed for measuring learning outcomes. Therefore, the exploration of web-based learning assessment mode is not only the practical need for conducting open distance instruction and assessment reform at China Central Radio and Television University (CRTVUS), but also has become a hot research topic in the whole sphere of distance education. Under this circumstance, the Examination Center in CCRTVU began to show research interests in exploring web-based assessment mode. As a consequence, in 2005, the Center applied for and launched research project "Practice and research on web-based learning assessment in open and distance education", which is approved by Ministry of Education as a key project program of 2005. This article reports the important research contents of the project. This article first describes the core achievements of the project—namely, design and implementation of the web-based assessment system, principles in creating assessment scheme for the mode, and the mechanism. Then it moves on to report feedback from the pilot population about the application of the web-based learning assessment mode in the two semesters of year 2005. The article ends with the discussion of innovations the research has made.

Key words: learning assessment, open and distance education, system development, web-based assessment.

China Radio and Television University (CRTVUs) has a distance education and teaching system, which is composed of CRTVU, the academic headquarter, 44 provincial RTVUs, 987 municipal RTVUs, and over 3000 RTVUs at county levels (learning centers). Currently, it offers 49 bachelor programs and higher diploma through radio, TV, print, audio-visual materials, and CAI courseware for its enrolment of over 2 millions students. Its big student population, widely geographically distributed learning centers, and great differences in teaching facilities and resources lead to the fact that it can be claimed to be the most complex and biggest distance education provider. One of many aspects to be considered in running the CRTVUs effectively is learning assessment.

Learning assessment is defined as assessment and evaluation of the learners' learning activities, process, and outcomes. It is inclusive of two components: continuous assessment and terminal assessment. It is a truly important procedure in any educational context in that it can assess learning outcomes, motivate or pace learners to study and provide feedback on their performance, increase learner-tutor interactions, provide information for teaching improvement and policy making and ultimately help maintain academic standards and quality (Morgan & O'Reilly, 1999; Niu *et al.*,2005; Rowntree, 1987). Continuous assessment is of great value due to process-oriented nature and primarily formative function (Kallick, 1997). The importance of continuous assessment has been realized at RTVUs. The Examination Center at CRTVU has been engaged in exploring approaches for continuous assessment. For instance, in 2004, a research project was launched named "Practice and Research on Learning Assessment in Distance Education"(Yang, 2004), where a learning assessment conception combing continuous assessment with terminal assessment (end-of-course) was called for and 'Printed Formative Portfolio' for all courses were designed and put into experimental but widely use as major method for continuous assessment. The portfolio assessment approach is given positive comments at RTVUs but it is found to have some unavoidable weaknesses, including prolonged feedback, difficulty in control, and high cost.

In recent years, as the Internet access is increasingly available, to carry out The Plans for Vitalizing Education in 21st Century, approved by State Council of the People's Republic of China, in 1999 Ministry of Education (MOE) started a modern distance education project that allowed 68 universities including China RTVUs successively to launch modern distance education pilot. Modern distance education is internet-based. So far, the pilot institutions have succeeded in delivering programs and support services through modern communications technology, in particular, the Internet. However, as far as the education assessment mode is concerned, the conventional paper-pencil test or end-of-course assessment is still overwhelmingly employed for measuring learning outcomes in most of these pilots. Therefore, the exploration of web-based learning assessment mode is not only the practical need for conducting open distance instruction and assessment reform but also has become a hot research topic in the whole sphere of distance education. Under this circumstance, the Examination Center began to show research interests in exploring web-based assessment mode. As a consequence, in 2005, the Center applied for and launched another research project called "Practice and research on web-based learning assessment in open and distance education" which was approved by MOE as a key project program of 2005.

This article reports the important research contents of the project. This article first describes the core achievements of the project — namely, design and implementation of the web-based assessment system, principles in creating assessment scheme for the mode, and the mechanism. Then it moves on to report feedback from the pilot population about the application of the web-based learning assessment mode in the two semesters of 2005. The article ends with the discussion of innovations the research has made.

Research Objective and Requirements for the Web-based Assessment Mode

The project team addressed its research goal – to create and establish a web-based course assessment mode applicable for modern open education mode and administration mode on the basis of precondition that some important limitations such as characteristics of open distance education and adult in-service learning. Specifically, the goal covers three integral sub-topics: (1) develop and implement an internet-based learning assessment system, (2) design and practice of assessment scheme for the internet-based course learning assessment, and (3) establish corresponding management procedures and management mechanism.

At the outset, the following principles were put forward. First, the mode should be web-based in order to give full play to the strengths of computer and network in selecting, storing, delivering and processing answering data to implement personalized assessment. In other words, we should make full use of the advantages of the Internet technology to achieve what is difficult to accomplish in the traditional paper-and-pen test. Secondly, to give full-play role of the assessment in motivating and pacing learners to study, there is a need to terminate conventional practice of end-of-course assessment served as the only learning measurement approach. Rather, continuous assessment and terminal assessment should be integrated and course assessment should be interwoven into teaching process. Thirdly, the assessment activities should be designed to fit with modern testing theory so as to not only measure the course-specific knowledge such as conceptual, factual, procedural knowledge but also evaluate soft abilities including critical thinking, problem solving, as well as personal, social, and moral outcomes. In a word, we should ensure promptness, validity, accuracy, cost-efficiency of assessment; ultimately, enhance distance education quality and learning efficiency in the light of all notions above.

METHODOLOGY

This section introduces the integral components of a new assessment mode, including the development of the assessment system, the principles and process in creating an assessment scheme for the web-based evaluation mode, and finally how the mode works, and the corresponding managing mechanism.

Description of The Web-based Learning Assessment System

In order to achieve the research objective, we put forward the technical requirements of the assessment system before the design gets started.

a. Multi-role assessors should be allowed. In this system, not only tutor assessment and peer assessment but also self-assessment can be conducted.
b. Multi-role assessment can be produced. The system can not only achieve what end-of-course examination can do, i.e. assessment of course-specific knowledge and skills but also evaluate some non-cognitive abilities such as moral experience, the ability to solve problems, critical thinking, co-operative spirits.
c. Dynamic assessment and test on individual basis can be conducted. The system can provide task or test for each single student at any time. In addition, the system introduces what the teacher can do when giving feedback in the traditional classroom into the

distance education context. This means that the system allow the tutor to make prompt and specific comments on learners' performance, which may vary from person to person, from time to time, and from situation to situation. After that, the system will collect all answering data that students accomplished and form a folder or portfolio, serving as records of progress each student made in the course of study.

d. The system is expected to be a special path where tutor-learner and learner-learner interaction are increased and feedback between tutor and learners is enhanced.
e. The system is expected to be a common platform applicable to diversity of courses assessment. It should be designed to support different assessment tasks types or item types as many as possible.
f. Because of the computers and Internet's powerful data processing ability, the system would make the web-based assessment more cost-effective than traditional paper-pencil test.

To meet with the practical demands for conducting Pilot Study for Open Education, learning assessment system is made up of three subsystems, i.e., self-assessment system, continuous assessment system, and terminal assessment system (Yang, 2003). The three systems are supposed to complement each other and form a complete course assessment system, namely, CRTVU Examination Platform in Web site of www.etas.com.cn. Self-assessment system and summative system have been developed and put into use in 2004. So in this research, we focused our attention on the design and development of continuous assessment.

Continuous Assessment System

As the continuous assessment system is closely related to learning process, the system has the following characteristics and functions for the successful integration of assessment with learning.

a. Assembling. In the platform the student can apply for tests or assignments at any time. The tests can be items contributed by tutors or assembled automatically by the computer using items bank.
b. Both online answering and offline answering are allowed by the system. The system can deliver all answering data including various types of files and performances-based assessment tasks at high speed.
c. System will automatically control the timing of assignment: scheduling and timing, to be more specific, the machine can control starting date and deadline for submission of each task and timing for students to take a test.
d. In accordance with the design, objective tasks will be marked by the system automatically. As to subjective tasks, they can be corrected and marked by the tutor at anytime, and synchronous double-markings, even multi-marking are supported. Furthermore, the system classifies the answering contents of special tasks, say, contribution of group conferencing to facilitate marking.
e. The tests scores, answer key for reference, comments, guidance can be feed back to students shortly after the students take the test. What's more, the remedial learning material tailored for overcoming learners' difficulties or obstacles diagnosed can be sent to one student or more students at the same time.
f. The system has the function to form "assessment folder" for each student, providing

information to improve learning efficiency and teaching standards.

g. The system should have the function to collect answering data, produce results statistics analysis data and evaluation reports for learners, tutors, mentors and administrative staff to help them to monitor learning process.
h. Students can see their scores records once they log in the system; besides, the tutor and administrative staff can export the records in various text format, say, MS EXCEL, MS WORD and likewise.
i. The system is supposed to be equipped with the function to calculate various quality indexes and adjust parameters of the items in the items bank.
j. Establish import and export access to comprehensive registration management system to facilitate registration management.

User Roles in the Continuous Assessment System

Working with "overall planning, graded running, graded management" mechanism, CRTVUs has a four-tiered governance structure, namely, academic headquarter (CCRTVU)-- regional administrative center (44 provincial RTVUs)--municipal RTVUs -- regional learning center. Therefore, the following roles including system administrator, teaching and examination administrator, tutor, and mentor. In addition student should be disposed within the continuous system to satisfy the existing mechanism, teacher position-setting and technical requirements for the computer system raised by the continuous assessment mode. The relation between roles and governance structure is shown in Table 1.

Among the roles mentioned above, system administrators technically take charge of normal operation of the assessment system, while teaching and examination affair administrator at various levels are in charge of examining the qualification of the tutors respectively. Course coordinator at the central level is responsible for organizing the course team to design course assessment scheme, and electronically published in the Continuous Assessment Platform. Course coordinator at the provincial level is in charge of confirming the qualification of tutor of his own province; marker is responsible for marking; mentors (head teachers and tutors) take charge of keeping track of each student's progress, reminding students to submit their tasks at a given time.

Table 1. Configuration of Roles in the Continuous Assessment System

	Central TVU	Provincial TVUS	Learning Center	Non-RTVUS System
System administer	yes	There is one system administrator disposed at each node		
Teaching & Examination administrator	yes	yes	yes	
Central/Provincial Course coordinator	yes	yes		
Provincial Course Coordinator		yes		
Marker			yes	yes
Mentor/Tutor			Yes	
Student			yes	

This system is applicable to all hierarchic distance education providers with three levels of "academic headquarter-regional management institution-learning center".

Procedures in Continuous Assessment System

As is indicated in Figure 1, the web-assessment goes through the following stages: publishing of the tasks, accomplishing tasks or assignments as directed, correcting and marking, feeding back to learner, storing grades data, filing the answering data.

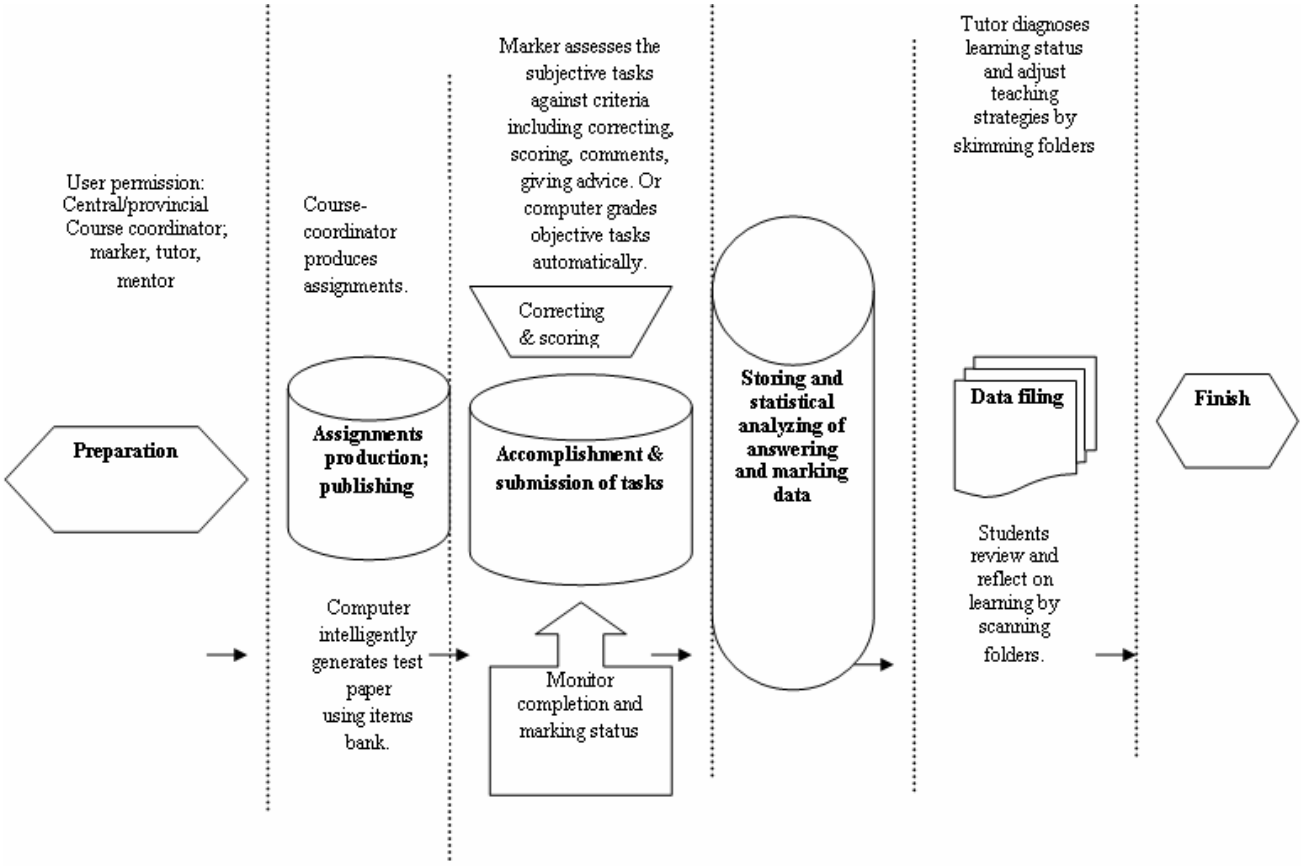

Figure 1. Flowchart of Continuous Assessment System

a. Preparation phase. The first step of this stage is user registration including student self-registration, tutor self-registration. After the students self-register, the system will automatically examine the registration accounts with the same student's data stored in the student management database and confirm identity as the students finish registration. Similarly, after the tutor finishes self-registration, his identity and roles permission will be examined and assigned by administrators at corresponding level. Next, virtual teaching classes will be set up. The students choosing the same course are divided into different classes according to such factors as the learning center the student registered at, course duration, tutor's workload. In addition, the virtual class can be divided further into

collaborative learning groups, or small learning groups formed on their voluntary basis. Meanwhile, the database of students and tutors are established.

b. Production and publishing of the assessment tasks. Course coordinator is responsible for this work and is granted rights to select geographic area and course duration. Besides, what is meant by publishing assessment task also covers publishing task name, task type, scheduling (including deadline for rating), task weighting, and setting up system automatic reminding strategy. Tasks are produced either by course coordinator or computer intelligently using the item bank. After publishing, provincial RTVUs has the freedom to adjust course duration. If this is done, submission deadline will be changed to a new date automatically according to a certain proportion.
c. Submission of the finished tasks. The system is equipped with some functions to facilitate submission of assignment. First, the system submission sets starting date and deadline for each task. Then according to tasks schedule, the system can remind students regularly what tasks have to be completed before a given time, and refuse the assignments submitted later than the deadline, or keep a record of the action and deduce scores on the tasks according to certain proportion.
d. Correct and grade tasks submitted. Objectively marked tests will be graded by the computer automatically. While subjective activities require the tutors to evaluate, grade and make comments on them according to rating scale. Moreover, the teacher can offer academic advice and remedial materials to students based on how well students complete the tasks.
e. Monitor process and quality of completed tasks. The system reports completion and scoring status by listing graphical statistics data including number of tasks completed, completion proportion, proportion of marked assignments, mean score etc. Moreover, the coordinator or tutor can spot-check how many and how well a student has finished the tasks and how well the tasks were marked.
f. Filing of answering files into “folders”. By reading these electronic folders, tutor get to know learning conditions and modify his subsequent teaching strategies, and the students review contents and reflect on learning, thus, enhance learning efficiency.
g. Statistic analysis of scores records. Statistic analysis is an essential step at post-test stage in that tests scores would be no value unless they have been processed.
h. Finishing. Records of all progress assessment assignments will be stored in the system till the course is over. Moreover, courses scores have to be confirmed before they can be exported out of the continuous assessment system and will be in the stock till one year later after graduation.

Test Items (Task) Types Supported by the System

Both objectively marked assignments and subjectively marked assignments are supported by the system. Objectively marked tests include single choice questions, multiple-choices questions, True-or-False, matching, and some real-life tasks. Subjectively marked assignments refer to such activities as blanks-filling, open-ended questions, case study, short-answer questions and calculation questions. Besides, there are more difficult and complex ones: product-based tasks in form of OFFICE files, audio, picture, web, compressed format, composition, essay academic report, experimental report, both asynchronous and synchronous group discussion on a given topic, and progress-oriented assignments.

Template for Designing Various Types of Courses Assessment Scheme

Success of Web-based course assessment in open and distance education is dependent on three basic conditions: good network environment, well-designed assessment plan, and appropriate management mechanism. Among the three components, the first one is the basis for the assessment, the second one serves as the core, and the third one acts the guarantee of success. Without well-designed course-specific assessment plan, advanced technological support services and administrative support policies would have resulted in vain.

3Is (Three Integrations) Guidelines in Designing Courses Assessment Activities

3Is (three integrations) guidelines are integration of instruction, learning and assessment, integration of online tasks and offline tasks, as well as integration of continuous assessment and terminal assessment. We maintained that assessment is by no means the last step in the course of study. Instead, assessment is one vital and integral part of an instruction programs, Assessment activities should be designed for placement, selection, assessing achievements, but more importantly, for helping identify learning objectives, diagnosing learners' problems and difficulties. Only if assessment is interwoven with learning and work in a mutual way, can we give full play role to formative function of evaluation and assess what has been taught, arriving at the assessment is truly intended for: making test serve for instruction.

Second point, integration of continuous assessment and terminal assessment should be designed as a whole. Continuous assessment differs from terminal assessment in nature, targeted content, conditions and measuring instruments. For example, continuous assessment is formative, ongoing, developmental, encouraging, open and administrative in nature, yet, terminal assessment is summative, normal (standardized) and society-oriented. Therefore, one needs to take into account the roles they play in teaching respectively, nature and type of the course, and what you want learners to achieve before he writes testing specification and constructs assessment tasks.

Last point, integration of online and offline activities should consider current status of Internet access across the whole RTVUs, the project team suggested that web-based assessment does not signify being dependant on Network totally. In practice, students don't need to stay online in the course of completion when they do some subjectively marked tasks, say, composition in English Writing. Actually, they need to log in system only when they apply for and submit a task.

Furthermore, for different test contents, we need to take into consideration the test time, place, requirements, and approaches. As far as learning and development objectives of a particular course are concerned, it's unlikely to rely merely on a single measurement tool or assessment approach. Choice and simple question can be used for checking knowledge, understanding, and application. Essay and other writing tasks can be employed for assessing students' abilities to organize and express their views. Some tasks, which request students to raise questions and look up materials from libraries or collect data (via interviewing or lab observation), can be adopted for measuring students' particular abilities in finding and solving questions. Observation technique is suitable for evaluating students' operational abilities and

other performance, and self-reporting technique works better for assessing interests and attitude. To a certain extent, the web-based learning assessment has made achievement in the fields of multi-assessors, diverse measurement tools, modernized assessment approaches, and full-scale assessment contents.

Procedures for Constructing Course Assessment Scheme

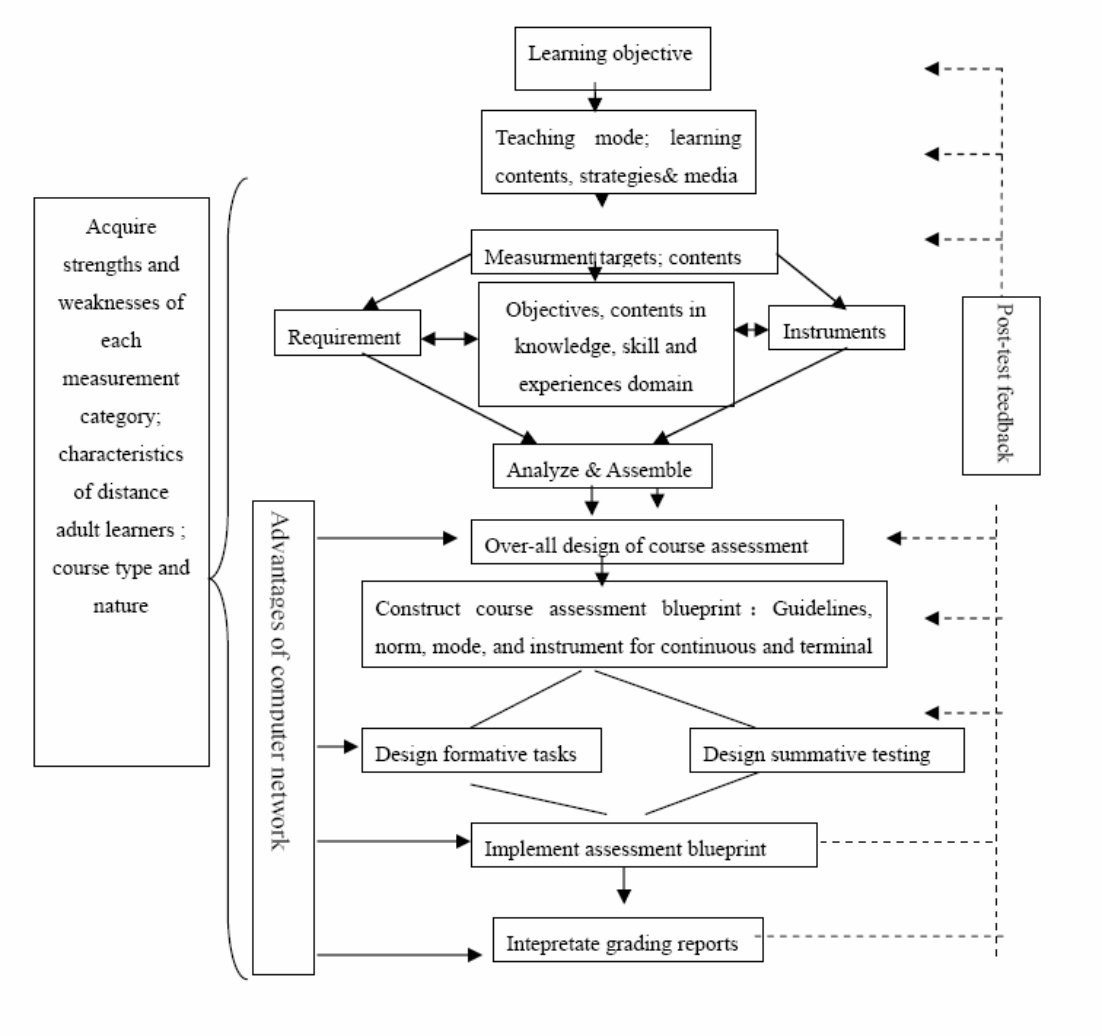

Figure 2. Flowchart of Constructing Assessment Scheme

Figure 2 shows the procedures in constructing assessment scheme. Before drawing up a scheme, a scheme writer is assumed to know: (a) strengths and weaknesses of each measurement instrument and characteristics of mature distance learners should be taken into account; (b) measurement category should be selected on basis of learning objectives,

teaching mode, resources, strategies; and (3) assessment objectives, contents, guidelines, rating scale, benchmark, and likewise need to be specified explicitly.

Framework for Web-based Assessment Scheme

Assessment scheme is should be in line with syllabus and kept pace up with teaching progress. As a document for guiding implementation of assessment, it is supposed to specify four overall requirements as follows: measurement objectives, weighting continuous assessment and terminal assessment counts for the final score for this course respectively; and what to be measured in the continuous and terminal respectively, pass benchmarks.

Weighting of CA in final score	Weighting of TA in final Score	What to be covered in CA	What to be covered in TA	Pass benchmarks
X%	Y%	Chapter X, etc, Unit X, etc. …	Cover whole course book or focus on which several chapters.	For example: student will fail the course unless he pass CA and TA pass mark respectively.

Next, the following four things are to be done: (a) identify what to be measured, guideline, marking criteria and instruments for CA; (b) Determine how many tasks are required for CA, which is assumed to be the appropriate study load; (c) Define learning contents-oriented measurement assignment category, proportion, answering instructions, marking criteria; and (d) schedule for tasks appropriate for the pace of instruction. The same case is applied for constructing TA testing. In addition, a writer needs to specify examination date, test items types, difficulty, number, sequence, open-book test and marking scheme and rating scale.

What to be targeted	C A assignment Types	Weighting	Score	Instruction	Assessor &Marking criterion	Schedule for submission
Chapter X	Phased objective test (n_1)	I_1%	X_1	Fixed time allocation	Computer auto-marking	Set starting date and deadline for each assignment
Unit X	Subjective assignment (n_2)	I_2%	X_2	Varied time allocation	Human-rater against rating scale.	
……	Conferencing type assignment (n_3)	I_3%	X_3	Provide marking samples or scheme		
……	Self-study records (n_4)	I_4%	X_4			
……	Performance-based assignment (n_5)	I_5%	X_5			

Management Mechanism for Web-based Assessment in the 3-tiered Education System

This mechanism is based on the target management theory, tailored for distance education teaching requirements, and characterized as “clear objectives, collaborative efforts, process

monitoring, learning services". It is a perquisite for any sound management mechanism to define roles of stakeholder. Due to limits to space, this article focused on description of roles responsibilities.

a. The course coordinator is required to: organize and manage course assessment board to develop course assessment scheme; deliver and publish assignments on schedule; oversee and supervise regularly or irregularly assessment processes and procedures and provide feedback on their performance; oversee regularly marking processes and procedures and providing feedback; summarize and interpret the results of rating across all RTVUs.
b. Provincial Course coordinator is required to: Set up the course implementation scheme; supervise and monitor course teaching and marking process and procedures; supervise assessment process and provide feedback, guidance and counseling support back to learning centers; supervise marking process and procedures and providing feedback or guidance support; develop, distribute and teaching and learning materials online; synthesize and analyze data of rating results of his own provincial RTVU.
c. Course tutor and marker is required to: Correct and mark responses promptly and give detailed comments, advice or support; provide guidance and support services tailored for each learner, put it another way, send remedial materials to student's folder to meet special needs.
d. Course tutor is required to: prepare and give face-to-face tutorial; offer guidance on self-study; monitor and remind student to submit assignments on schedule.
e. Mentor is required to: supervise tutors and learners attendance; monitor assessment process; encourage, remind, and provide counseling support to facilitate learning.
f. Network administrator is to secure the use of network; examine and appoint role jurisdiction; provide technical help to learners and tutors to solve computer or network problems.

Assessment Implementation

The section describes the stages the research has gone through.

a. As early as 2004, development of courses assessment system was initiated so as to get assessment reform pilot study be prepared.
b. In January 2005, six courses were selected for the preliminary pilot study, and CRTVU hosted a workshop in Beijing for this special purpose. In this meeting, the research project team put forward reform purpose and implementation principles.
c. Then, in spring semester of 2005, pilots web-based assessment of six courses including *Advanced English Writing, Macro and Micro Economics, Brief Introduction to Linguistics, Website Design Technology, Enterprises Strategic Management, Open English (I)* were lunched at 28 RTVUs, involving faculty of 151, and 3985 students.
d. Next, till fall semester of 2005, on the basis of what has achieved at preliminary pilot, the pilot was expanded to 13 courses, and requires each provincial RTVU to select 1 to 2 classes to participate in the reform. The number of participants amount to 12084.
e. In spring semester of 2006, in order to deepen assessment pilot study, course-specified seminars across RTVUs were held in Beijing and other cities successively, exchanging hand-on experiences and achievements gained in the pilot study. For example, the

Examination Center hosted Concluding Conference on Advanced English Writing Assessment Reform in city of Bejing.

f. Followed with the upgraded and optimized continuous assessment system and rich experiences, the pilot continued to expand to 48 courses, 69055 learners, 4306 tutors and mentors across 1162 learning canters of the System.

RESULT AND DISCUSSION

In this section, the results of the research are presented consisting of appraisal made by China MOE on the continuous assessment system, a student survey on the assessment mode, as well as tutor and students in-depth interview responses.

MOE Scientific and Technological Achievement Appraisal on Continuous Assessment System

On May 10, 2007, Web-based continuous assessment system was given Scientific and Technological Achievement Appraisal by MOE. This continuous system, which is applied in the China RTVUs, a mega distance system in the world, is innovative in test paper generation. Algorithm, assessment approach combining objective with subject test items and customized function for assessment procedure, this scientific achievement is advanced in China. The Appraisal committee suggests that this project should be served as a model for technological solution scheme and application for research on continuous assessment in distance education, and be expanded to whole distance education sphere.

Internet Survey on Reaction to the Reform

Internet survey was conducted to track attitude towards learning and the coursework. The questionnaire was designed and delivered on the homepage of Continuous assessment platform and all participants in the Reform Pilot were invited to fill in the form on their voluntary basis. 112 copies of questionnaire were collected and analyzed in spring term 2005 and 615 copies in fall term 2005.

1. How long do you stay online per week?

Time length	Over 20 hours		10 hours - 20 hours		5 hours - 10 hours		1 - 5 hours		Within 1 hour	
	f	%	f	%	f	%	f	%	f	n
No. of students in spring 2005	25	22	21	19	25	22	32	29	9	8
No. of students in autumn term 2005 (percentage)	74	12	61	10	111	18	320	52	49	8
Total Number	99	14	82	11	136	19	352	48	60	8

2. Where do you access the internet to do course work?

	Home		Study center		Workplace		Internet bar		Other places	
	f	%	n	%	n	%	n	%	n	%
No. of students in spring 2005 (proportion)	38	34	11	10	45	40	11	10	7	6
No. of students in autumn term 2005	307	50	43	7	228	37	25	4	12	2
Total Number	345	47	54	7	273	38	36	5	19	3

3. In your opinion, is it necessary to implement this assessment reform?

Attitude	Necessary		Don't Care		Unnecessary	
	f	%	f	%	f	%
No. of students in spring 2005	76	68	30	27	6	5
No. of students in autumn term 2005 (percentage)	363	59	185	30	67	11
Total Number (percentage)	439	60	215	30	73	10

4. Are you satisfactory with this reform so far?

Satisfaction degree	Satisfactory		Relatively satisfactory		Unsatisfactory	
	f	%	f	%	f	%
No. of students in spring 2005	1	1	92	82	19	17
No. of students in autumn term 2005	98	16	449	73	68	11
Total No.	99	14	541	74	87	12

5. How do feel your workload in this reform?

Workload	Over load		Full load		Moderate		Light load	
	f	%	f	%	f	%	f	%
No. of students in spring term	10	9	30	27	68	60	4	4
No. of students in autumn term	65	11	161	25	377	61	12	2
Total number (percentage)	75	10	191	26	445	61	16	2

6 . How do you comment on your tutor or marker's performance?

Degree	Qualified		Relatively Qualified		Not qualified	
	f	%	f	%	f	%
No. of students in spring 2005	68	61	44	39	0	0
No. of students in fall term 2005	473	77	124	20	18	3
Total No. (percentage)	541	74	168	23	18	3

7. Is the reform helpful for your learning?

Degree	Quite helpful		A little helpful		Not helpful		NA	
	f	%	f	%	f	%	f	%
No. of students in spring 2005	52	46	50	45	3	3	7	6
No. of students in autumn term 2005	205	33	331	54	43	7	36	6
Total No. (percentage)	257	35	381	52	46	6	43	6

8. How do you like the continuous assessment platform?

Degree	Very user-friendly		Relatively User-friendly		Relatively complicated	
	f	%	f	%	f	%
No. of students in spring	20	18	83	74	9	8
No. of students in fall term 2005	203	33	332	54	80	13
Total No. (percentage)	223	31	415	57	89	12

From the results of opinions survey on students, we can draw six conclusions as follows:

a. The fact that a majority of students access internet at their home or workplace means that they have the basic network conditions to conduct autonomous learning and accomplish assignments whenever it is convenient to them.
b. Over 60% students felt that it is of value to carry out the reform
c. Nearly 90% mentioned that they are satisfactory or relatively satisfactory with the effects the reform has on the course of study
d. More than 90% acknowledged that their tutors or markers are qualified and relatively qualified
e. Nearly 90% students suggested that the continuous assessment platform plays critical role in helping master the learning material in that they can receive timely feedback and more one-to-one interaction with tutor
f. Over 80% students felt that interface of the platform is user-friendly.

To sum up, analysis of the results found that students' opinions on the course assessment reform are positive.

Reaction to Assessment Mode from In-Depth Interviews

The Internet survey was followed by several in depth interviews held at pilot RTVUs. Analysis of the interview recordings tape-scripts shows that either tutors or students made their positive comments on the web-based assessment. A majority of them expressed their preference on this new approach to conventional way.

The following are extracts from the tape-scripts of interviews.

A student from Miyun RTVU, Beijing, taking *Advanced English Writing*

> *I, adult learners, used to believe that I was too busy to engage study due to the family and career commitment, yet these 24 ongoing web-based assignments force us to squeeze time to engage on coursed study and the 8 group conferencing improved my English competence. For instance, I never spoke out in English in the public, but now I am crazy on chatting in English with my group members.*

A tutor from the same RTVU:

> *In my class there were always some students handing in their continuous assignments behind schedule for one reason or another. But now they are more time conscious than before, because each assessment task has a time limit, they have to get used to this tight schedule and manage their time.*

A student from Gudong RTVU, taking *Accounting Computerization*

> *This assessment not only increased our hands-on experiences and operational skills but also decrease pressure and anxiety over the tests. More importantly, The results of ongoing tests can help us locate at which point I am still unclear and need more practice. But there were something wrong with Internet access in the course of delivering my assignments.*

A student from Zhaoqing RTVU, Guangdong province, taking *accounting computerization:*

> *I think this web-based course assessment is a new and attractive thing. First, it is flexible. I can apply for a test whenever it is convenient to me so that I have hands on my spare time. Secondly, these ongoing tests can force us to review regularly what I have been taught; Third, some real-life assignments gives us hands-on experiences in process and procedure in accounting computerization; Fourthly, students have to spend time on the test items and get familiarized with these test contents, this in turn improve performance in end-of-course examination. Finally, I have to pass test on previous chapter before I can take the test for next chapter as I do in playing computer clearance games. This is quiet useful to intensify mastery of course materials.*

It is found that their reactions to assessment mode, particularly, comments on the effects of the assessment on learning are in accordance with literature and results of previous research at high level (Niu *et al.*, 2005). First, the continuous assessment can pace or force them to engage their course studies and a wide range of activities contributed to upgrading their academic achievements (Niu, 2006). Second, this assessment has good effects on their learning efficiency. First continuous assessment can help learner diagnose difficulties and obstacles in the course of study; what's more, it can decrease risks and worries in passing the end-of-course examination. Third, it is a more valid and reliable measurement than end-of-course examination because it attach emphasis to the progress the students made instead of end-of-course examination. It is process-oriented and progress based. Fourth, this assessment offers more flexibility of study in time and space.

However, everything has two sides, there are some problems. Stability of the system is an outstanding problem. Second, some tutors and students still have misunderstanding of the new approach; consequently, something has to be done to change their conceptions.

CONCLUSION

To a certain extent, the web-based learning assessment solves the problems that the conventional paper-pencil test has encountered in the aspects of prolonged feedback, weak pertinence and poor controllability in process management. First, from perspective of instruction, assessment is interwoven with instruction and we have done what assessment is intended for: assessment serves for instruction. In this mode, through the assessment platform, course coordinator (or course team) can deliver assessment assignments whenever necessary to meet instructional demands and evaluate where the students have arrived at. Similarly, students can receive promptly, tailored comments and feedback on their performance. After that, as the instruction goes on, based on the teaching pace, results of assessment and other external factors, course coordinator can modify testing scheme, test items construction, direction when necessary. From the perspective of instructional management, this mode has advantages over traditional assessment in management process supervision for the following reasons. First, in the process of assessment implementation, computer performs its powerful data processing capabilities including keeping records of

answering data and process, marking data and process, and subsequent data storing, grouping, statistical analysis, comparison and the like, which make it possible for tutor and administrative staff to spot check students answering data, thus intensifying process supervision. To sum up, in conventional approach, this would not have been implemented without vast investment in human resources, facilities, and finance at such large scale.

Point two, to a certain extent, the web-based learning assessment has made achievement in the fields of multi-assessors, diverse measurement tools, modernized assessment approaches, and full-scale assessment contents. It allows multi-role assessor, namely, tutor assessor in most assignments, peers assessor in group conferencing assignment and self-assessor in students themselves becoming the subject of assessment, say, students can choose to accomplish their tasks repeatedly according to the scores they make. Second reason, it is a modern, paperless evaluation instrument and application model of human intelligence to objective test items. Third, it conducts a comprehensive assessment covering knowledge, skills, and experiences domains and with emphasis on evaluating learning process, activities and achievements.

Point three, it spurred innovations in distance learning measurement conceptions, measurement approach and measurement targets; meanwhile, it drove deepening of internet-based teaching and learning reform, to be more specific, it has improved computer literacy of all stakeholders and the full use of computer and online teaching resources to facilitate learning. It fueled the cultivation of distance learning strategies including learner-centered, task-driven, reflective learning, query-guided. A case in point is that: computer's intelligent function to automatically control scheduling and timing for submission and grading enhanced learners and tutor's time consciousness, and then this fact leads to cultivation of learning style and teaching management. Besides, it increased tutor-learner, learner-learner interaction.

To conclude, currently, although this new approach is restricted by many limits in Internet infrastructure, learner's financial conditions, and teaching resources in regional learning centers and perception of learning assessment, results of over-two-year experiment has brought out conspicuously the advantages of this approach, and attracted widespread attention of the whole distance education field. Moreover, this new assessment mode is in trend for distance education and suitable for in-service learning, consequently, it may be asserted that web-based assessment will be used as an important learning evaluation approach for distance learning.

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