

# Techniques for Assessing Students' eLearning Achievement

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## Abstract

*This article puts the emphasis on testing and evaluation of students' work in an eLearning setting. A new approach in the assessment of eLearning is introduced aiming at providing more information about students such as their background, knowledge, skills, attitudes, values and relationships with instructors as well as other students. Also, Assessment of Computer-Assisted Instruction, called ACAI, is suggested to provide the most appropriate eLearning assessment technique.*

## Introduction

Assessment, defined as the activity of measuring learning, aims to collect data about students' learning achievement, at the same time, reflecting teaching effectiveness of instructors.

Assessment techniques for classroom teaching and learning has been intensively studied. Variety of techniques have been proposed.

Angelo and Cross (1993) have proposed 50 classroom assessment techniques:

### 1. Techniques for Assessing Course-Related Knowledge and Skills

#### 1.1 Assessing Prior Knowledge, Recall, and Understanding

- 1) Background Knowledge Probe
- 2) Focused Listing

- 3) Misconception/ Preconception Check

- 4) Empty Outlines

- 5) Memory Matrix

- 6) Minute Paper

- 7) Muddiest Point

#### 1.2 Assessing Skill in Analysis and Critical Thinking

- 8) Categorizing Grid

- 9) Defining Features Matrix

- 10) Pro and Con Grid

- 11) Content, Form, and Function Outlines

- 12) Analytic Memos

#### 1.3 Assessing Skill in Synthesis and Creative Thinking

- 13) One-Sentence Summary

- 14) Word Journal

- 15) Approximate Analogies

- 16) Concept Maps

- 17) Invented Dialogues

- 18) Annotated Portfolios

#### 1.4 Assessing Skill in Problem Solving

- 19) Problem Recognition Tasks

- 20) What's the Principle?

- 21) Documented Problem Solutions

- 22) Audio-and Videotaped Protocols

#### 1.5 Assessing Skill in Application and Performance

- 23) Directed Paraphrasing

- 24) Application Cards

- 25) Students-Generated Test Questions

- 26) Human Tableau or Class Modeling

- 27) Paper or Project Prospectus
2. **Techniques for Assessing Learner Attitudes, Values, and Self-Awareness**
  - 2.1 *Assessing Students' Awareness of Their Attitudes and Values*
    - 28) Classroom Opinion Polls
    - 29) Double-Entry Journals
    - 30) Profiles of Admirable Individuals
    - 31) Everyday Ethical Dilemmas
    - 32) Course-Related Self-Confidence Surveys
  - 2.2 *Assessing Students' Self-Awareness as Learners*
    - 33) Focused Autobiographical Sketches
    - 34) Interest/ Knowledge/ Skills Checklists
    - 35) Goal Ranking and Matching
    - 36) Self-Assessment of Ways of Learning
  - 2.3 *Assessing Course-Related Learning and Study Skills, Strategies, and Behaviors*
    - 37) Productive Study-Time Logs
    - 38) Punctuated Lectures
    - 39) Process Analysis
    - 40) Diagnostic Learning Logs
3. **Techniques for Assessing Learner Reactions to Instruction**
  - 3.1 *Assessing Learner Reactions to Teacher and Teaching*
    - 41) Chain Notes
    - 42) Electronics Mail Feedback
    - 43) Teaching-Designed Feedback Forms
    - 44) Group Instructional Feedback Techniques
    - 45) Classroom Assessment Quality Circles
  - 3.2 *Assessing Learner Reactions to Class Activities, Assignments, and Materials*
    - 46) RSQC2 (Recall, Summarize, Question, Comment, and Connect)
    - 47) Group-Work Evaluations
    - 48) Reading Rating Sheets
    - 49) Assignment Assessments
    - 50) Exam Evaluations.

## **From Classroom Assessment Techniques to E-Assessment techniques**

As far as eLearning is concerned, e-students study through systematic integration of multimedia, digital or analogue, asynchronous or synchronous, on line or off line, narrowcast or broadcast, such as the Internet and e-book in the form of CDs. Students interact with instructors by e-mail and with their friends via chat room and also e-mail. They might contact instructors and friends by telephone.

The assessment of eLearning is usually administered through various forms of (1) center-based testing conducted at a designated testing center under the close supervision of proctors, and (2) the evaluation of assignments such as reports; projects, and exercises submitted via e-mail.

These two types of assessment have certain disadvantages as it can evaluate mainly only cognitive ability. The assessment of quality on students' work does not reflect the instructional activities specified in the objectives. The author therefore proposes a new approach of eLearning assessment in which assessment plays an integral part of instructional activities to provide feedback to instructors.

### **1. An assessment of students' background**

A collection of students' background information should be done by the registrar's office in order to help elearning manager to understand them. The techniques are:

- 1) Background Knowledge Probe
- 2) Focused Listing
- 3) Misconception/Preconception Check
- 4) Empty Outlines
- 5) Memory Matrix
- 6) Minute Paper
- 7) Muddiest Point
- 8) Categorizing Grid
- 9) Defining Features Matrix
- 10) Pro and Con Grid

## 2. E-Testing

In eLearning, types of tests and test items bring different information to assessors.

Tests are typically classified into

- (1) Objective type test:
  - 1.1 Multiple choice
  - 1.2 True-False
  - 1.3 Matching
- (2) Subjective type test:
  - 2.1 fill in word
  - 2.2 fill in phrase
  - 2.3 fill in sentence
  - 2.4 write a passage
  - 2.5 write a long passage, report, and thesis

The objective type test provides possible answer for test-taker to choose while the subjective type test requires a test-taker to answer the questions.

Paper-pencil tests play very significant role as an important assessment tool in classroom situation. Since computer plays as part of educational media, the adaptive testing is designed to apply test to computer. The adaptive testing requires an item-bank. When students want to take a test, he/she registers the name, course ID and password. Then test items will appear on the screen and the student answers through computer. It is very efficient to tap the ability of the student.

Easy test item will appear first in order to check the level of student's ability. After that more difficult test items will appear. The student can take many test items up to his/her ability. If he/she fails to answer correctly 5 items consecutively, the test will be stopped and the score will appear. The student will receive test result immediately.

The adaptive testing is designed to individual student in accordance with his/her ability. Thus, each student, taking the test in the same room and at the same time, may not answer the same test item. The test result shows each student's ability.

## 3. The evaluation of students' work

Instructors may assign students to hand in reports, exercises, or projects. Students may send these works through e-mail. It is the duty of the tutor/instructor to promptly and objectively evaluate the quality of the work.

The evaluation of the work will be constructive only if the tutor/ instructor gives feed back to students timely.

Haynes (2003) has suggested good feedback, importance of feedback and strategy to encourage students to use feedback as follows:

### Good feedback:

Haynes (2003) suggests good feedback should

- 1) Be based on the criteria for the assessment in question;
- 2) Give credit for what the student has learnt;
- 3) Be designed to give information on the quality of their work and its strengths and weakness;
- 4) Concentrate on the student's achievements, emphasizing their strengths and how they have improved;
- 5) Be positive and directed towards helping the learner to improve their performance;
- 6) Be motivational;
- 7) Be not overwhelming;
- 8) Encourage the students to reflect on their own work and work towards managing their own learning.

### Importance of feedback:

According to Haynes (2003), feedback is important for many reasons.

- 9) It is essential to learning;
- 10) It is motivational;
- 11) It helps students improve their work;
- 12) It is a means of recognizing students' effort;
- 13) Students can learn from it;

- 14) It can monitor progress and achievement;
- 15) It can identify areas where we can develop our teaching;
- 16) It can see where to direct students to further reading and make links with previous and future work;
- 17) It can make suggestions as to how they might develop future work;
- 18) To assist students in developing their study skills.
- 32) Commend them for any unexpected insights, special efforts or improvement in competence;
- 33) Draw attention to facts they have overlooked or misinterpreted;
- 34) Suggest alternative approaches or interpretations;
- 35) Suggest new sources of information and/or feedback;
- 36) Suggest how they might present their ideas more effectively;

Some suggestions to make more useful feedback:

- 19) Write legibly
- 20) Use comments such as 'I particularly like the use of', 'well-argued', 'could you have argued that...', 'is there an example in your reading of this?'
- 21) Let the students discuss your feedback with you and with each other
- 22) Be realistic when making recommendations for improvement
- 23) Be honest;
- 24) Don't just highlight weakness-give suggestions as to how student might overcome them;
- 25) Remember that good students need comments too!
- 26) Make sure the comments are diagnostic: tell them what they have achieved, whether they have achieved what they were supposed to, and (if not) what they would have to do in order to move towards achieving it;
- 27) Make links to subsequent work and teaching where possible;
- 28) Make clear what are the strengths and weaknesses;
- 29) Give comments that will help learners sharpen their practical skills;
- 30) Ask for further explanation of muddled answers;
- 31) Demonstrate useful shortcuts in procedures

### **How to encourage students to use feedback**

When students send in a piece of work, Haynes (2003) suggests e-teachers to encourage their students to add a separate sheet indicating

- 37) What they are pleased with
- 38) What they think they have done well (or tried to do well)
- 39) Which things were difficult and they are not too happy about, and about which they would particularly like comments
- 40) Their own assessment of the piece of work
- 41) Any other comments

After receiving the work back, Haynes (2003) suggests that students should do the followings:

- 42) Having read the grade to put the assignment on one side for a few days
- 43) When they are ready, to skim through the actual comments
- 44) Then they should read through their assignment, stopping to read the comments in the appropriate places. They should mark in a different colored pen their responses to what is written – anything they agree or disagree with, or anything they don't understand

- 45) They should now think about the grade again; if they are still unhappy, they should email their tutor
- 46) On a positive basis, they should look at the comments once more, and pick out two or three main points – pieces of advice, errors, things to remember: points which they could bear in mind when they write their next piece of assessed work

#### **4. ACAI: A New Approach for Assessment of Computer Assisted Instruction**

The computer-assisted instruction (CAI) is a type of programmed instruction designed for an individual to learn according to his own pace and convenience. The most important factors facilitating effective self-learning are active participation, immediate feedback, success experience, and gradual approximation (Brahmawong, C. 1991). The four factors help students learn effectively and gradually. If CAI is to be used as a tool for e-students, an assessment component for immediate feedback need to be added. Thus, the Assessment for Computer-Assisted Instruction (ACAI) needs to be installed as an integrated part of eLearning **systems**.

The ACAI should be designed in such a way that learning and assessment go hand in hand requiring e-students to engage in continuous formative assessment on every learning topic. ACAI will determine whether or not each eLearning activity, designed to be parts of formative evaluation, corresponds to the objective set forth in the lesson plan. The assessment of each eLearning activity, after being performed by the student, helps determine if the e-student has learned his eLesson in each unit or topic and help him evaluate himself if he is ready to continue studying the next unit or topic.

After completing each unit, the e-student must undertake the summative assessment, i.e. posttests, final exams, in order to certify that he has mastered what he is supposed to

learn, i.e. knowledge, skills, attitude, higher order thinking competencies.

ACAI requires integrated combination of both formative and summative assessment techniques to be imbedded in each CAI lesson. According to Brahmawong (1991), a self-learning module such as a CAI lesson should comprise six components: (1) Pretest, (2) Advanced organizer in the forms of lesson plan or an overview, (3) Body of content-knowledge or skills, (4) Learning activities or assignment, (5) Feedback, and (6) Posttest. ACAI ensures the continuous evaluation of the six components to ensure the effectiveness of eLearning.

Classroom evaluation techniques such as short questions, multiple choice type test, true-false type test may be applied as assessment techniques for ACAI.

#### **5. The observation of students' behavior in chat room**

eLearning requires students to interact with other students in the chat room. If chance allows, a tutor or instructor should observe students' behavior in order to find out:

- 1) Who chats with whom?
- 2) What do they chat about?
- 3) Is the content related to the course?
- 4) Does the content lead to understand critical thinking?
- 5) If there are more than 3 persons, who leads the group?

Tutor/instructor makes note of everything he/she observes. This will help him/her to make judgment about the quality of the course.

Distant education usually combines tutorial session with online learning. If tutorial sessions are used, tutors can observe students' behavior and interview student about what they have learned. Thus assessment techniques can extend to observe students' behaviors as well as to interview them.

Angelo and Cross's technique applicable to assess learner's reaction such as

- 1) Chain Notes
- 2) Electronics Mail Feedback
- 3) Teaching-Designed Feedback Forms
- 4) Group Instructional Feedback Techniques
- 5) Classroom Assessment Quality Circles
- 6) RSQC2 (Recall, Summarize, Question, Comment, and Connect)
- 7) Group-Work Evaluations
- 8) Reading Rating Sheets
- 9) Assignment Assessments
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### **Conclusion**

Five assessment approaches have been suggested in order to provide information about students' learning achievement, both cognitive and non cognitive. The eLearning

assessor should keep in mind that when eLearning is implemented, students should be developed into the desirable direction as they are taught in the classroom. Both classroom teaching and eLearning should be comparable and yield significant impacts to students' progress.

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