Classroom Assessment Techniques (CATs) for Online Instruction

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Abstract

Colleges and universities are being encouraged to focus not so much on how faculty teach but on *how students learn*. The Classroom Assessment Techniques (CATs) by Angelo and Cross (1993) provide faculty with information on how well students are learning in order to help students succeed not only in the course but also in the world beyond the classroom. Specific techniques best adapted to an online course are identified along with an explanation on how it improves student learning. Distance learning students increased from 710,000 in 1998 to 2.23 million in 2002, primarily due to the technologies of the Internet. With the need for more instructors to facilitate the increased demand for online learning, the importance of CATs in distance instruction is emphasized.

Introduction

The focus of student learning in this new century includes basic learning principles of 1) transforming students into active learners; 2) individualization; 3) the process of inquiry; 4) the ability to inquire with other people (collaborative learning); 5) participation; 6) support; and 7) education as an emotional experience (Katz & Henry, 1988; Ornstein & Hunkins, 1998). The optimal environment for learning exists when a high intensity of interaction is offered through encouraged feedback and when the faculty motivates and provides a sense of direct engagement (Norman, 1993; Richart, 2000). Colleges and universities are being encouraged to focus not so much on how faculty teach but on *how students learn*, thus engaging in an active educational agenda to enhance such learning. Focusing on how students learn means focusing on research regarding student learning styles, multiple intelligences, and the experiences of the students being taught (Richart, 2000). Focusing on how students learn also means conducting learner assessment in course instruction to evaluate the learner, the learning process, and the instructor.

To cope with the vast array of change in this world, the delivery of knowledge in future learning must include self-awareness skills, learning how to learn, information retrieval, lifelong learning, and preparation for the world of technology (Ornstein, 1998). Regarding the later, "the individual, in modern society, must learn to live with computers, robots, lasers, telecommunications, and space exploration. A truly educated, productive, and well-rounded individual will be able to function in an accelerating world of science and technology (Ibid, p. 153)." This infers that faculty will also need to be "well-rounded" to educate and guide students in this direction. Distance learning students increased from 710,000 in 1998 to 2.23 million in 2002, primarily due to the technologies of the Internet. "Teaching through the Internet has evolved at such a dizzying pace that it has earned its own spotlight in the pages of The Chronicle of Higher Education (Moore et al, 2001, p. 1.3)." With the need for more instructors, "there remains a need to present the technology and learning theories to those who stand along the edges waiting for a signal to step on the field and begin the game (p. 1)." Perhaps understanding

that the learning strategies of the classroom, such as assessment, can effectively be used online will help to recruit some new "players."

The Role of the Educator for Online Education

The role of the educator in a learning college is not one of teacher, expert, lecturer, or even a transmitter of knowledge. The new role in the 21st century is guide, director, or a facilitator of student learning. It is a person that promotes intellectual discoveries versus learning from lecture - an instructor that plans instructional strategies and learner assessments to monitor and assist students in learning before they ever take the final exam. Educators who facilitate online learning courses as much or more so than classroom instructors, must carefully plan instructional strategies to create a learner-centered environment that includes multiple assessment techniques to monitor their students' learning "from a distance." Teaching online means conducting a course partially or entirely through the Internet. The World Wide Web is the primary means of communication. Ko and Rossen (2001), said it best with this statement:

> So dynamic is the Web that new technologies and techniques are emerging all the time. What's commonplace one year becomes old hat the next. The only thing that seems to remain constant is people's desire to send and receive information efficiently, no matter what the means. That's what drives people to shop, invest, and converse online, and it is this same force that is propelling them to learn online as well. (p. 3).

All this innovation can be perplexing if the conventional tools of teaching have been removed, especially the concept of assessing students when you are not face-to-face with them in the classroom. The same "good practices" of classroom instruction and assessment techniques can be used online with a little imagination and creativity and the teaching and learning experience can be just as rewarding.

Good Practices

"College instructors who have assumed that their students were learning what they were trying to teach them are regularly faced with disappointing evidence to the contrary when they grade tests and term papers (Angelo & Cross, 1993, p. 3)." Richart (2000), referring to Chickering and Gamson (1991), in their well known article Seven Principles for Good Practices in Undergraduate Education, reminds us that "good practice" (1) encourages student/faculty contact; (2) encourages cooperation among students; (3) encourages active learning; (4) gives prompt feedback; (5) emphasizes time on task; (6) communicates high expectations; and (7) respects diverse talents and ways of learning. Keeping these practices in mind, several Classroom Assessments by Angelo and Cross (1993) are evaluated for use with online learning. In response to the emerging role of technology in education, Chickering and Ehrmann (1996) revisited their principles and discussed the role that technology could play in advancing these principles (Moore, et al, 2001). "Their essay, *Implementing the Seven Principles: Technology as Lever*, gives faculty keys to translate good teaching from the classroom of the 'real' to the classroom of the 'virtual' (Ibid. p. 11.5)." Two of the practices relate to classroom assessment: 1) contact between student and faculty; and 2) prompt feedback. Technologies for online communication such as email and threaded discussion encourage swifter communication, more open communication and more reflective communication. Technology also offers "immediate and reflective feedback opportunities, as well as opportunities for presenting and archiving

student performance for comparative evaluation in portfolio assessment strategies (Ibid. p. 11.6)."

What is Classroom Assessment?

Before faculty can explore online assessment, they must understand classroom assessment. Classroom assessment is a formative approach (not summative) because its purpose is to improve the quality of student learning, not to provide evidence for evaluating or grading students (Angelo and Cross, 1993; Stiggins, 2002; Taylor and Marienau, 1997). The purpose of assessment is to provide faculty with information on how well students are learning in order to help students succeed not only in the classroom or in the online "course room," but also in the world beyond the classroom. It is an ongoing process that provides opportunity for improvement in student learning and promotes the development of critical thinking skills as students learn to assess their own learning. Formative assessment provides feedback early in the learning processes so both the instructor and the student can make adjustments. If students know the results of the assessment, they know what to do to fill in their own gaps.

Assessment prevents surprises for the student as well as the teacher. "Improving student learning and teaching expertise will be necessary if the challenge of educating students for the twenty-first century is to be met. "As the college classroom changes, we have an opportunity to closely monitor and modify the teaching/learning process within that classroom. Classroom assessment provides a compelling model for realizing this opportunity (Angelo & Cross, 1993, p. 304)." In Classroom Assessment, faculty are encouraged to ask the following three questions: 1) what are the essential skills and knowledge I am trying to teach? 2) How can I find out whether students are learning them? and 3) how can I help students learn better? (Ibid.). In an online course, these questions are asked during course design, prior to the facilitation of learners, and as the course is facilitated.

Effective teachers use a variety of classroom assessment techniques, some formal and others informal, to determine how much and how well their students are learning. To evaluate classroom learning informally, faculty use these techniques to make quick adjustments to their teaching, slow down or review material, respond to questions or misunderstandings, or move on (Angelo & Cross, 1993).

Techniques for Assessing Course-Related Knowledge and Skills

Classroom Assessment Techniques (CATs) (Angelo and Cross) are tools for collecting data on student learning to improve it. Classroom assessment is done before formal evaluations of learning. Using Classroom Assessment Techniques builds a bridge between students and instructor, increases confidence of the learners, and provides a method of instructional communication. The CATS described in the following paragraphs work best with online instruction.

Background Knowledge Probe and Misconception/Preconception Check. The first step in online course instruction is to assess the learner's prior knowledge and understanding of the topic. Two assessment techniques are recommended: "Background Knowledge Probe" and "Misconception/Preconception Checks" (Angelo and Cross, 1993, p. 119). Both techniques can

be conducted with open-ended questions in the first "unit" or day of the course. For a management course the question might be, "What do you view as the top ten leadership skills required for management?" For a business customer service course, "What are five easy ways you can affordably make a customer happy?" For a Philosophy course, "What is your philosophy of life? Is there a philosopher you relate to?" Finally, for a human resources unlawful harassment course, "Of the ten examples listed below, which ones do think are illegal?" The unlawful harassment example could have several common misconceptions in this list. The answers that the students give helps the instructor identify the level of understanding and what misconception areas might need to be focused on. If these techniques are used in a threaded discussion (where students view each other's answers), one person's fact may be another's falsehood, interesting discussions pursue and diversity appreciation begins. Successful online classes require students to answer or "post to" at least two other students in the course room to create student interaction and to set the stage for cooperative or collaborative learning experiences.

Muddiest Point. A Classroom Assessment Technique used to assess recall, knowledge, or understanding is called "Muddiest Point" (pg. 154). The Muddiest Point technique provides information on what students find least clear or most confusing about a lesson. Following a text reading assignment, an Internet research assignment, or an instructor informational posting on a topic (in the web page design of the course or by e:mail), the students can choose two of three questions to answer. In addition, one required question should be "What was the muddiest point for you? What is still not clear? What concept are you still trying to grasp?" Allow the other students to respond to their postings. This allows students to learn from each other. At the conclusion of the learning section, the instructor can post a final statement of knowledge to review once again the muddiest points identify and offer some additional Internet links or online library resources for students to do further study. Often the last posting from the instructor, summarizing the group discussions, makes the muddy points come clear.

Guide Peer Questioning. Not listed in Angelo and Cross's book is a similar technique called "Guide Peer Questioning (Halpern, 1994)." Guide peer questioning can be a powerful and effective tool to teach critical thinking or identify unclear points. Halpern, 1994 notes:

> When professors teach their students how to ask thought-provoking questions and give explanations in response, they are likely to raise the level of thinking in their classrooms. When students learn to ask their own thought-provoking questions (both in and out of the classroom) and provide explanatory answers, they are well on the way to self-regulation of their learning. They are on the road to empowerment and are ready to embrace their futures (p. 34).

After a reading assignment online or in a text, students work independently to generate two or three questions based on the material. Next, they pose their questions in the online course room to their peers. The students then answer each other's questions in a reciprocal manner. "Deep learning" occurs when students have to synthesize the information to create thought-provoking questions.

Assessing Skill in Analysis and Critical Thinking. To assess skill in analysis and critical thinking, a Pro and Con Grid technique is recommended. The instructor can first describe the use of a "T-Chart" or grid to list the "pros" of an issue on one side and the "cons" of an issue on the other. The instructor needs to be clear on how many ideas are expected to be listed, such as "four or five" on each side. After the students evaluate the pros and cons, the students post their evaluation summary and conclusion in the online threaded discussion (or online "chatroom" where a "live" discussion is scheduled) and students are required to respond to at least two postings for student interaction. This technique develops analytical skills and depending on the topic, develops the ability to make informed ethical choices, evaluate contemporary social issues, or make wise decisions (p. 168). In a business course, students could do a cost benefit analysis. In a political science course students can evaluate a current legislative issue. In a Biology course, students can discuss viewpoints on the ethics of cloning. Most important, the instructor can observe through the postings the capacity of the students' objectivity and encourage them to carefully analyze both sides of an issue before making a final decision.

One-sentence Summary. To assess skill in synthesis and creative thinking, the One-Sentence Summary technique is an excellent choice for online learning especially when E:mail communication or written postings are the mode of communication. The One-Sentence Summary "enables teachers to find out how concisely, completely, and creatively students can summarize a large amount of information on a given topic (p. 183)." By condensing information into smaller, interrelated bits, the information is also more easily processed and recalled. These techniques improves memory, listening, and reading skills, develops the ability to synthesize and integrate information and ideas, and develops management skills required by most organizations.

Document Problem Solutions. The Documented Problem Solutions technique helps learners deal with real-world problems and guides students through a process where they keep track of the steps they take in solving a problem to "show and tell how they worked it out (p. 222)." The higher goal in this assessment is to see how well students can describe their problem-solving method. They are then more likely to use the same method in the future. In a problem solving assessment, students have to transfer learning to a specific situation and practice new knowledge. A case study that relates to the topic of discussion, such as a business ethics dilemma, an irate customer scenario, a conflict between teams in a company, a mathematical brain buster, or a tough decision for a manager, should be relevant to both the course and the real world. Three or four students in the online course room can be assigned the same case study. They can communicate through the online tool of choice, e:mail, threaded discussion, chat room, or a web e:group, such as Yahoo.com. Using pro and cons, group discussion, Internet research, and/or evaluation, the team posts their conclusion or solution. More important, they post the steps they took to reach their conclusion or solution. With all groups required to post their step-by-step process, the instructor and the students become aware of a range of possible successful, and perhaps unsuccessful, approaches to problem solving (p. 225).

Directed Paraphrasing. To assess skill in application and performance, the Directed Paraphrasing technique can be used (p. 231). Directed Paraphrasing provides feedback on students' ability to summarize and restate important information or concepts in the students' own words, allowing the instructor to assess how well students have understood and internalized the learning (p. 232). In addition, it develops the students' ability to translate specific learning into a

form that someone outside the classroom can understand. "Directed Paraphrasing is particularly useful for assessing the students' understanding of important topics or concepts that they will later be expected to explain to others. For example, in the fields such as marketing, social work, public health, education, law, and criminal justice, much of a student's eventual success depends on his or her ability to internalize specialized and often complex information and then to communicate it effectively to the public (or to management) (Ibid.)." A good example of this would be a nurse communicating with a doctor or a patient or a police officer's required report writing. The procedure for Directed Paraphrasing for online instruction is to select an important theory, concept, or argument that the students have studied. Direct the students to paraphrase the same topic for two very different audiences and explain in detail the difference between the two paraphrases. Give the students an example to guide them through the process. An example of a Directed Paraphrase assignment would be an online law enforcement class. The students have just finished studying California State Law for traffic violations. The students are asked to paraphrase violations one through five from the list for 1) a high school audience and 2) a document for a law officers staff meeting. This type of assignment would be sent directly by E:mail to an instructor for evaluation and feedback. A general approach for any topic would be to have students read separate reading assignments and then post a paraphrase as a summary of the topic for others to read. For example, if there are multiple methods of achieving the same goal in a specific learning assignment, rather than have the students read all of the methods, accelerate the learning time by assigning one method to two or three students to review and post a paraphrase for the other students to read. Often students will print these summaries from the online course room and use in the future for more formal recall studies and evaluation at the end of the course.

Techniques for Assessing Learner Attitudes, Values, and Self –Awareness

Online learners need to be actively involved in their own learning to be successful. There is a high level of responsibility required of students enrolled in distance learning. "There is now a good deal of research evidence to suggest that the more time and effort students invest in the learning process and the more intensely they engage in their own education, the greater will be their satisfaction with their educational experiences, and their persistence in college, and the more likely they are to continue their learning (Report on Excellence in American Higher Education, 1984, p. 17; Angelo & Cross, 1993, p. 255)." Active engagement requires self-awareness and self-direction. Several online assessment techniques can be modified from the Angelo and Cross CATs. To evaluate self-confidence, a survey can be given on a specific topic with levels of "none," "low," "medium," or "high" confidence. For a math course, the student (and the instructor) would identify low confidence areas. The students can be given an opportunity to share their low-confidence areas and share ideas in the threaded discussion online ideas to decrease anxiety or improve self-confidence. "The simple act of publicly acknowledging that students may have low levels of self-confidence in certain areas – and that there may be some things they can do to remedy that situation – offers relief to many students, who believe they are the only ones to feel as they do (Angelo & Cross, 1993, p. 278)." This concept is similar to "learning communities" where students build confidence by learning together.

Another technique to improve student learning is the Interest/Knowledge/Skills Checklists. By asking students the skills or topics they want to focus on, the instructor can shape the course to best match the students' needs, thus increase the motivation for learning and improve student success. "By providing instructors with detailed, specific information on their students' interests and self-assessments of their skills and knowledge, the checklist makes course instruction more focused and effective and the students will invest more effort in the course (p. 288)."

Last, the technique of Self-Assessment of Ways of Learning is an evaluation of learning styles. If the student thinks carefully about how they learn or that there are options in the ways one can approach learning, they may experiment with other ways of learning. The instructor will be informed on the preferred learning styles and present the instruction in accordance with the preferred styles. All of these assessment tools that have multiple choices can be designed in Microsoft Front Page or with the assistance of the online support services at the college or the learning management system that the online course is posted on. There are also several options on the Internet where evaluation tools can be designed and the results of the surveys are sent to the instructor. Some of these are free and some have a small fee. More information on this can be found by using the search engine " www.google.com" and typing in keywords "surveys," "evaluation tools," or "rubrics."

Use of Feedback

The most important Classroom Assessment for online learning is Feedback and Course Evaluation. Specific techniques used for online instruction is Electronic Mail Feedback (p. 237), Teacher-Designed Feedback Forms (p. 330), or posted comments in the online course room. Students need prompt feedback following online assignments and group discussions. The instructor does not need to give feedback to every single student, demonstrating expertise to the point of dominating the class, but rather find a balance from giving feedback to one or two different students for each assignment, to carefully selecting postings that are exceptionally good to praise, and to selecting some that may need a little more clarification. In some cases, suggestions for further study or a specific web site may be in the instructor response. Online feedback forms are important at the end of the course for course improvement and are usually anonymous and sent to college administration, but a simple request for a one or two paragraph feedback sent privately by E:mail from the students to the instructor is important to improve the direction or focus of the learning to improve student success and course completion rates.

Summary

Classroom Assessment Techniques changes the role of the teacher from expert to helper. Finkel and Monk (1983) propose that teachers will have to distinguish between teaching and learning roles and "functions." Roles imply the duty and responsibility of the teacher and of the student. Function implies who or what can best serve the student to assist transfer of learning (Ibid). A learner-centered environment becomes a learning journey, where more is gained from the process than from the final outcome. Angelo and Cross (1993) recommend that instructors experiment with one or two simple Classroom Assessment Techniques for one or two semesters before engaging in more systematic assessment efforts (p. 32). With online learning, one simple assessment technique per assignment, even if it is simple feedback, it is highly recommended for

student success. Without assessment, the instructor will not be able to identify the gap between what was taught and what was actually learning. "Teaching without learning is just talking (Angelo & Cross, 1993, p. 3)." In an online course, teaching without learning, or teaching without assessment, is just posted text on a web page.

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