

Classroom Assessment Techniques: CATs in the Online Classroom

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### Abstract

Formative assessments are an important part of the teaching and learning cycle. Instructors need to monitor student learning and check for understanding throughout the instructional phase of teaching so they know that students understand the objective before embarking on the summative assessment. Formative assessments can help to make sure that there are no surprises. Typically, online classrooms are created with weekly learning modules that end with a summative assessment in the form of an assignment or quiz. This leaves instructors with the task of creating formative assessments for each week. The authors have created a conceptual model for online classes that shows the steps for implementing Angelo and Cross' (1993) Classroom Assessment Techniques (CATs) in this modality. Steps for implementation as well as ideas for specific CATs in the online classroom are discussed.

*Keywords:* Assessment, formative assessment, Classroom Assessment Techniques, CATs, online learning

## **Introduction**

In education, two main types of assessments have emerged, formative assessments and summative assessments. While both of these assessment types are vital to instructional strategies and the measurement of student learning outcomes, formative assessment will be the basis of the following theoretical model. Formative assessments and feedback are used in classrooms to manage learning processes, inform instruction and decision making (Nicole & Macfarlane-Dick, 2013). Boston (2002) defined formative assessments as “opportunities to assess how students are learning and then use this information to make beneficial changes in instruction” (para. 1). Traditionally, online courses have been designed with only summative assessments in place, such as graded discussion questions, participation, weekly assignments, and quizzes and/or exams. However, formative assessments are also necessary to check for student understanding in the online classroom prior to the summative assessment. This article will look at Angelo and Cross’ (1993) Classroom Assessment Techniques (CATs) and present a theoretical model on how to implement CATs in the online classroom.

### **Literature Review: Classroom Assessment Techniques**

In order to identify student mastery of a given concept, there is an instructional need to know what the students have learned as well as what they have not. Angelo and Cross (1993) explained that there are often major gaps between what was taught and what was actually learned. In addition, it is often too late by the time the teacher identifies what objectives the learner has not mastered. Because of these elements, it is essential to utilize formative assessments within the classroom. More specifically, CATs are utilized as one method to bridge this learning gap that may occur between teacher and student. The authors stated “the central purpose of Classroom Assessment is to empower both teachers and their students to improve the

quality of learning in the classroom” (p. 4). Through the use of CATs, instructors can use formative assessments within the classroom to meet this instructional goal.

### **Formative Assessment in the Traditional Classroom**

Classroom assessment has been an educational concept long before Michael Scriven named the distinction between formative and summative evaluation in 1967 (“Evaluation”, 2001). There are a great number of reasons to use assessment and evaluation within a classroom such as identification of student learning outcomes, a modality for feedback from the teacher to student or vice versa. As referenced by Nicol and MacFarlane-Dick (2006), Black and William (1998) gathered over 250 studies ranging back to 1988 to examine the effects of feedback. The focal point was to examine real teaching situations and both teacher and student made assessments. Black and William found that the feedback that was provided by both teachers and students following these assessments was beneficial. This effective feedback led to learner gains (Nicol & Macfarlane-Dick, 2006). Formative assessment is a viable way to provide fast and effective feedback to students on the spot without waiting for a summative assessment.

Within the traditional classroom, teachers and instructors alike have been utilizing assessment to determine student knowledge and learner outcomes. When an instructor is aware of the rate and level in which his or her students are progressing, in addition to when students are struggling, adjustments can be made during instruction such as additional practice, lesson redirection, re-teaching as well as using alternative teaching strategies or approaches (Boston, 2002). More specifically, within the last few decades, formative assessment has been utilized to address a more student-centered classroom that can allow for immediate feedback as well as instantaneous redirection for the instructor (Nicol & Macfarlane-Dick, 2006). In addition,

formative assessments such as Angelo and Cross' CATs can be considered to be a way to empower students to become more self-regulated learners (Nicol & Macfarlane-Dick, 2006).

### **Formative Assessment within the Online Classroom**

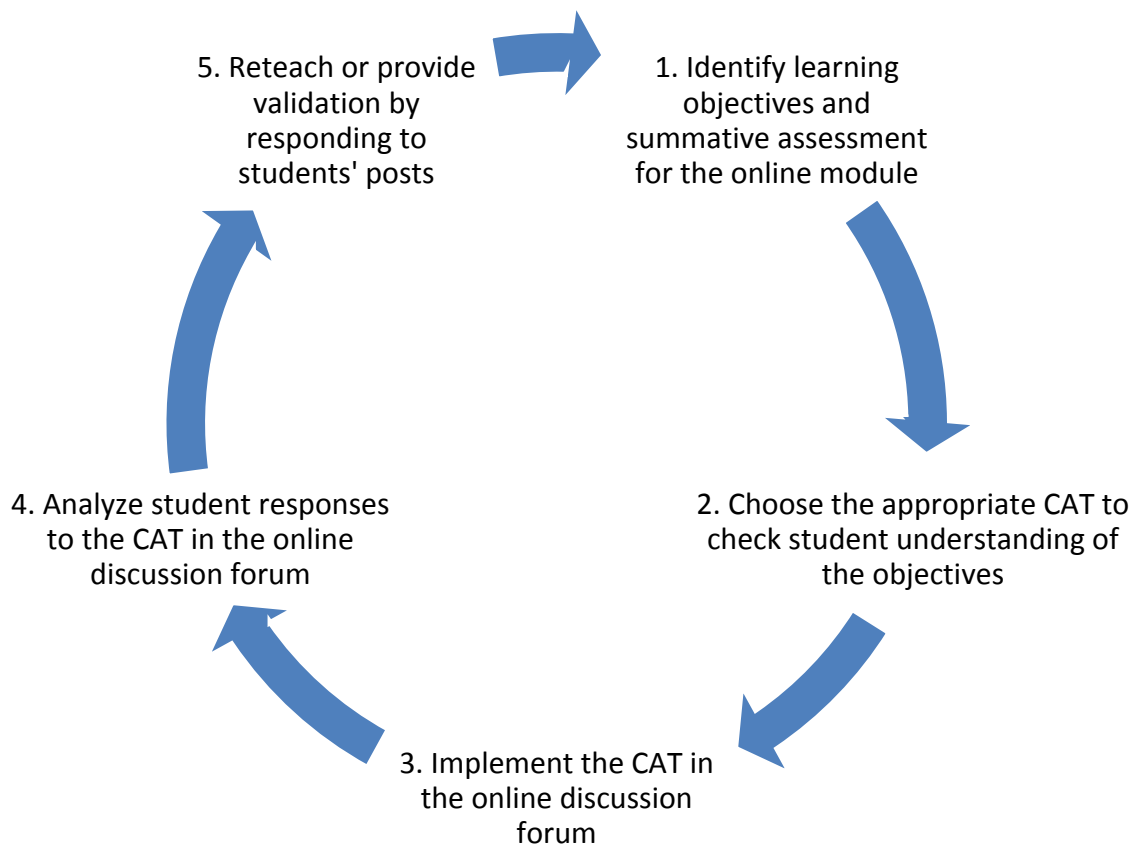
As formative assessments have been deemed useful within the traditional classroom, there has been little examination and development as to how this form of evaluation can be used in online learning modalities. Learning using an online modality has allowed for “the reformation and modernization of roles for both the teacher and learner as well as the transformation of relationships and practices within the classroom (Vonderwell & Boboc, 2013). In order to best foster these changes in education, there is an obvious need for the use of innovative teaching strategies that provide a meaningful feedback loop between the instruction and assessment. This connection can occur from the use of formative assessment as their use will provide instructors with specific data identifying and explaining learning needs and areas in which to improve instruction (Vonderwell & Boboc, 2013). “Understanding and evaluating student learning becomes essential specifically when students and instructors cannot see each other” (Vonderwell, 2004).

There have been a number of documented benefits found in using formative assessment such as CATs within the classroom. Not only will this technique open the ways of communication between the instructor and student, it also allows for a friendly tone within the classroom. Expressing a voice that is accurately interpreted can be a challenge when individuals are not face to face. A common concern with online education for both learners and instructors is the lack of teacher presence. Many students imagine simply reading the text and completing the assignments with little to no interaction from the teacher. In fact, many online courses exist with this set-up. However, formative assessments such as CATs allow for the personalization in teaching and

learning that can create “a friendly online learning environment to minimize existence of transactional distance” (Vonderwell, 2004).

In addition, using CATs assists online students that may be low-achieving or struggling. Formative assessment in the online classroom notifies both teachers and learners of gaps that may exist in current knowledge (Boston, 2002). Because of the above elements, the use of formative assessments such as CATs has begun to be successfully seen in asynchronous online classrooms with good results (Henderson, 2001). However, as the use of CATs in the online classroom is in a state of infancy, to best foster the new roles that this modality has brought to the world of academia, a conceptual model is needed to best introduce CATs into online learning.

### Conceptual Model



*Figure 1: Conceptual Model of Classroom Assessment Techniques for the Online Classroom*

Classroom Assessment Techniques can be used effectively in online classes. The conceptual model for CATs in the online classroom consists of a five-step process. Each phase of this model is important to the formative assessment process and in student learning and instructional delivery. These steps have been designed modified to meet the needs of an online classroom.

**Step 1: Identifying the Objectives**

The first step of the implementation of the CATs into the online classroom is identifying the weekly objectives as well as the summative assessment. In many online classrooms, one or more assignments is due at the end of the week. CATs are put in place to check for student understanding prior to attempting the summative assessment, or assignments.

Phase 1 of CATs implementation is creation of the Classroom Assessment Technique. Many of the CATs that are presented by Angelo and Cross (1993) can be easily adapted to the online classroom. Instructors must look at the desired outcome and objective for each week of the class to find what is most appropriate.

**Step 2: Choosing the Appropriate CAT**

To choose the proper CAT, an instructor must identify the “assessable” question (Angelo & Cross, 1993). This will allow the instructor to choose the most effective CAT for the objectives that are being learned. Two areas of focus should be if the student response will change the way the lesson is taught and if the teacher feedback will assist the student learning process (Angelo & Cross, 1993).

**Step 3: Implementing CATs in the Online Classroom**

To implement Classroom Assessment Techniques into the online classroom, the discussion forum can be used. An extra discussion post can serve as a formative assessment for the weekly topic and objectives. An example of this could be the KWL strategy. Based on the topic and objectives for the week, an extra post can be added at the beginning of the week to ask students what they already know about the topic and what they want to learn about the topic. Toward the end of the week, students can be asked what they learned about the topic and objectives. The responses of the students can be used to address any misunderstandings or to provide positive feedback for those who are on the right path.

Angelo and Cross (1993) recommend that the created CAT is tested before it is used in the classroom. This can be done by having the teacher complete the Classroom Assessment Technique and/or having a colleague test the CAT. The purpose of this phase is to be sure that the CAT is easy for students to complete as well as to make sure the desired outcomes are gained.

#### **Step 4: Analysis of Student Responses to CATs**

The purpose of CATs in the online classroom is to monitor student understanding of the objectives. Instructors can check for understanding by analyzing student responses to the CATs. Each response must be viewed and checked for accuracy. This process will allow instructors to get a quick understanding of whole class and individual learning before the summative assessments.

#### **Step 5: Provide Directed Feedback for Re-teaching or Validating Student Understanding**

In the online classroom, instructor responses and feedback are the catalyst of the teaching process. Instructor feedback in the CATs will provide students with either direction if they misunderstand the topic or objectives or verification if they are on the right track. Instructor



responses are critical to close the loop in the Classroom Assessment Techniques process (Angelo & Cross, 1993).

Analysis of the Classroom Assessment Technique effectiveness is an ongoing process. Student responses must be interpreted by the instructor and then feedback must be formulated that will support the desired learning outcomes (Angelo & Cross, 1993). The authors suggested that the results of the CAT are shared with the students. Next, the effectiveness of the CAT should be evaluated for effectiveness in the teaching and learning process. This provides the opportunity for data driven instruction in the online modality.

Future use of the CATs should be based on the effectiveness of the process as well as the individual characteristics of a particular class. As all students learn differently and all classes have a different dynamic to them, the analysis of the Classroom Assessment Techniques can be used to monitor and adjust the teaching and learning process.

### **Discussion and Conclusion**

Online classes are commonly formatted with an online forum to house participation and interactions that can mimic discussions that would be held in a traditional classroom setting. The discussion forums are viewable to all members of the class, both instructor and student. These can range in number; however, these online discussions often occur between two to three main discussion questions throughout the week. On top of discussion, other elements are frequently found in the online modality such as weekly assignments and/or quiz due at the completion of each module. The assignments and quizzes represent the form of summative assessments for the week or module. Due to the accelerated nature of an online classroom, it is essential that students obtain a solid grasp of weekly concepts prior to completing summative assessments. However,

gaps in the teaching and learning cycle can cause students to approach the summative assessment without fully mastering the objectives. Classroom Assessment Techniques can fill these gaps.

Classroom Assessment Techniques can be added to the weekly modules of an online classroom quite easily. The CATs will provide the students with an opportunity to address the objectives before the summative assessment as well as providing the opportunity for the instructor to check for understanding. As instructors review student responses, they are provided with additional feedback opportunities. Black and William (1998) explained that feedback is beneficial for student learning and growth. In using CATs, instructors can monitor student responses and provide feedback to redirect or give affirmation to student understanding.

Classroom Assessment Techniques come in a variety of different types. Many have been identified by Angelo and Cross (1993). Several of these methods work very well in the online classroom and are beneficial for increasing student participation and helping them to better understand the objective before beginning the assignment or quiz (summative assessment). As there is little literature regarding Classroom Assessment Techniques in the online modality, further research in this area is needed. Specifically, the effectiveness of CATs in increasing student learning outcomes would be helpful. Specific CATs, such as the Background Knowledge Probe, Double-Entry Journals, the Muddiest Point, and Minute Paper should be studied along with other CATs to see their effectiveness toward increasing student learning.

Innovation in strategies and techniques for both the online learner and instructor has assisted online classroom instruction in making educational strides. In turn, online education has become a popular instructional modality for non-traditional students. Due to this increase in popularity, it is essential that best classroom practices are researched, examined and modified to meet the needs of the online learner. Research has found that checking for understanding in each

learning module is important for the teaching and learning process to the learner. As this is vital to not only the traditional student, but also the online learner, more research in this area will extremely vital to the success of online education.

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