Classroom Assessment Techniques:
Checking for Student Understanding in an
Introductory University Success Course

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Classroom Assessment Techniques (CATs) have been used in traditional university classrooms as a strategy to check for student understanding (Angelo & Cross, 1993). With the emergence of online learning and its popularity for non-traditional students, it is equally important that instructors in the online environment check for student understanding before the summative assessment. The Misconception/Preconception Check is one type of CAT that can be used effectively in the online classroom. This CAT can be used to activate background knowledge or beliefs that could potentially delay or block further learning (Angelo & Cross, 1993). In this study, data is examined to see if this particular CAT can make a difference in student learning outcomes in an assignment that has been historically challenging for students in a beginning University Success course. This study's findings suggest that the selected CAT does have a positive influence on student success for this assignment.

Assessments are an important part of the teaching and learning process. Teachers need to know if their students are learning and mastering the objectives of a particular course or unit. Through the use of evaluation or assessment, both teacher and student have the opportunity to see through the looking glass and reflect on the quality of teaching as well as the learning outcomes (Wenjie & Chunling, 2013). In addition, timeliness of feedback allows for shortcomings and achievements to be addressed while also illuminating further instruction (Wenjie & Chunling, 2013). The need for effective teaching in real time drives the need for various forms of assessment. While summative assessment can provide in-depth, detailed evaluations of student work, there is a need to proactively and informally evaluate students prior to the final project, assessment, or essay. Because of this, summative and formative assessments are both important in the teaching and learning process. Angelo and Cross (1993) assigned the term Classroom Assessment Techniques (CATs) to a variety of formative assessment strategies that can be used in the college classroom. For the purposes of this study, Classroom Assessment Techniques will be the focus.

The online classroom often presents unique challenges. First, many online courses are organized by weekly learning modules with a summative assessment given at the end of the week. Classroom Assessment Techniques are flexible and may be modified to become formative assessments for each weekly learning module. This study will focus on a specific Classroom Assessment Technique, the Misconception/Preconception Check (Angelo & Cross, 1993) used in an introductory University Success course to help students with an assignment, which has been historically difficult for students. The purpose of this study is to examine if this CAT can increase summative grades, student learning outcomes, and overall achievement on a summative evaluation used to determine students' understanding of university assignments.

BACKGROUND

Various types and styles of assessments are necessary to accurately determine student learning and overall achievement. Formative assessment is an instrumental piece of this process. Formative assessment can improve student achievement on

summative assessments (Popham, 2008). It is also important to note that formative assessment must be used during the instructional phase of teaching. Popham (2008) stated that the formative assessment can be used to modify instruction as data is collected from the students. This is an ongoing process during instruction as more data is uncovered.

Angelo and Cross (1993) observed the problem of faculty not identifying the gaps in learning and understanding until it was too late to address. Monitoring learning and adjusting teaching is an important ingredient for student success. For students and teachers to not only identify challenges and achievements, but also improve higher order thinking and learning, CATs may better supplement the assessment processes. CATs have some specific uses as identified by Angelo and Cross (1993). According to the authors, CATs are "learner-centered, teacher-directed, mutually beneficial, formative, context-specific, ongoing, and firmly rooted in good practice" (Angelo & Cross, 1993, p. 4).

Classroom Assessment Techniques have been used in the traditional university classroom for an extended period of time. Research has shown that the flexibility of CATs can help reach multiple assessment goals (Henderson, 2001). Henderson (2001) researched CATs in a distance education setting using a CAT similar to the Minute Paper identified by Angelo and Cross (1993). The results of this study suggested an increase in participation as well as depth of posts. With the growth of online education, it is important to use formative assessments in this modality.

Angelo and Cross (1993) have identified several CATs that can be implemented in the traditional classroom with little effort. Among these are the Minute Paper, the Muddiest Point, the One-Sentence Summary, Directed Paraphrasing, and Application Cards. Each of these CATs can be modified, adjusted, and implemented into an online discussion forum.

For the purposes of this study, a CAT identified as the Misconception/Preconception Check was introduced to four beginning University Success courses to uncover possible issues prior to addressing or completing the assignment. Angelo and Cross (1993) explained that this CAT is effective for checking what students already know about a topic, and it also uses this prior knowledge to identify possible hindrances to further learning. The authors stated that prior knowledge can often compromise

future learning (Angelo & Cross, 1993). In this study, instructors developed a questionnaire that identified prior knowledge and attempted to unravel misconceptions that could interfere with learning. This quantitative study examined if this CAT led to an increase in student learning outcomes as well as higher grades on a specific assignment.

METHODS

In week six of the course, the students' main objective was to identify the necessary skills of becoming a successful, novice online learner in higher education. Students showed mastery of this objective through a summative assessment titled "Understanding an Assignment Worksheet." After teaching many sections of the University Success class, it was apparent that this objective was not being met through the summative assessment. A majority of students turned in an incorrect assignment, indicating that students did not understand the objective. Therefore, it was necessary that a formative assessment be implemented prior to this summative assessment to help aid student success on the "Understanding an Assignment Worksheet."

This specific CAT is intended to reveal areas of confusion and lack of knowledge that will create obstacles to new information (Angelo & Cross, 1993). When students are successful with this type of CAT, they are able to recognize their misconceptions or preconceptions early on and make the changes to incorporate their newfound knowledge to the appropriate summative assessment (Angelo & Cross, 1993). The Misconception/Preconception Check CAT consisted of a brief overview of the week's summative assessment. Following this overview, three true/false questions were listed to check for student understanding (see Appendix A).

This CAT was implemented in the first discussion forum of week six on day two of the week. It was specifically placed there due to the number of student discussions occurring in the classroom at this time. In past courses, students frequently posted and held discussions here; therefore, they had a higher chance of seeing this formative assessment. To draw their attention to the post, the subject line was changed to all capitals with the title "WEEKLY SPOT CHECK." As the students responded to the CAT, it was vital to provide feedback; this feedback took the form of continued encouragement, an intervention, or remediation.

PARTICIPANTS

For the purposes of this study, the information was retrieved from four online University Success classes. The number of participants totaled 96. Of these 96 students, 39 participated in the optional Misconception/Preconception Check CAT or 40.625% of the total population. The others chose not to participate. The typical demographic of students in this class were non-traditional students pursuing a degree in education in hopes of becoming certified teachers. University Success was the first class in the teacher preparation program. For consistency, four classes taught by the same instructor were chosen to gather the sample.

DATA COLLECTION

Data was gathered by examining the student participation in the CAT for each course. The Misconception/Preconception Check was added as an optional post in the discussion forum area of week six of each course. Two data sets were collected including if a student participated in the optional CAT, or not, and the grade on the corresponding assignment. The number "zero" was used to indicate a student who did not participate in the CAT and "one" was used for those who did participate. The grades on the assignment were assigned a numerical score of four for an A, three for a B, two for a C, one for a D, and zero for an F. This assignment did not use a grading rubric; however, the grades were determined through the use of a grading scale. Students earned an A if they successfully completed answering the eight questions on the assignment. Students earned a B if they answered 80% of the questions on the assignment. Students earned a C if they answered 75% of the questions correct on the assignment. Students earned a D if they answered 60% of the questions on the assignment. Finally, students who earned an F did not answer any questions on the assignment or completed the assignment incorrectly by writing a 500-750-word essay rather than answering eight short questions.

RESULTS

A one-way ANOVA between-subjects design was conducted to compare the participation in the Misconception/Preconception Check CAT and students' grades on the week six assignment. This statistical test was chosen to test the null hypothesis that investigated whether the CAT produced higher student outcomes based on the average grade of each student who participated compared with those who did not. At a 95% confidence level, the mean grade point average for students who did not participate in the CAT was 2.4364 (M = 2.364). For students who did participate in the CAT, the mean grade point average for the completed assignment was 3.7250 (M = 3.7250). The results indicate that there is significant difference in grade point average between the students who participated in the CAT compared to those who did not. Figure 1 (below) offers a graphic representation of the difference.

Figure 1: Student grade point average with and without CAT participation.

Classroom Comparison
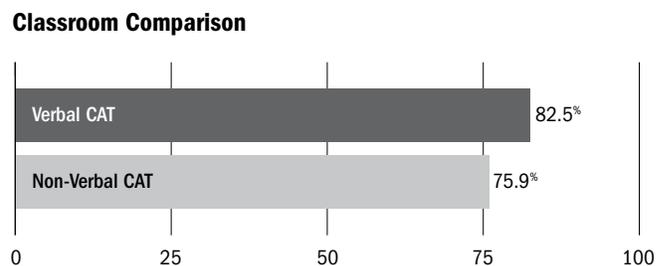
DISCUSSION

There is indication in examining these results that the Misconception/Preconception Check CAT made a significant difference when students participated in it. This particular CAT asked three questions, which guided students toward the appropriate way to complete the assignment. The questions were true and false and offered a quick check of student understanding before they attempted the assignment. Angelo and Cross (1993) stated that this CAT gives students the opportunity to learn new material in an accurate way. The misconception about this assignment is that the students must write a complete essay, but in actuality, it is a worksheet that describes an assignment in a future class. When the instructions are read carefully by the students, it is understood that the essay is a sample of an assignment for them to analyze. The objective of the assignment is to understand a typical university assignment and to answer eight questions at the end. This CAT checked students' understanding of the assignment instructions, as many students in the past have tried to write the actual essay.

This brief and small-scale study carries implications for future research. Although only one form of

CAT was used on one assignment, the results show that a CAT could have a positive impact on student learning and understanding. In the University Success course, this is the students' first opportunity to analyze a future assignment. Each week of an online course affords instructors the opportunity to formatively assess student learning on the objective before the summative assessment. The Misconception/Preconception Check CAT could be used in a variety of classes and objectives. This study should be replicated using a larger data set as well as different forms of CATs and different assignments. The early indications are that CATs in an online classroom can increase student learning outcomes if they are carefully selected and implemented.

It is important to note the main limitations to this study. In the course described in this study, the Classroom Assessment Technique used is optional for student participation. This raises the following questions: do the students who need the additional help use the CAT, or do the students who normally participate in the course participate in the CATs as well? These students may be the ones who are already succeeding in the course. In addition, while this CAT is optional, Appendix A indicates that student responses could be counted toward participation. Another limitation is in the data collection tool. The data was informally collected from existing courses and has not been validated at this time. More research is needed to delineate these limitations.

With the growth of online learning, it is important for instructors to identify best practices related to student learning outcomes. Classroom Assessment Techniques are one way to strategically check for understanding before the summative assessment. Instructors can easily implement CATs into each week of the online classroom, create an easy monitor, and adjust processes to online instruction. The result could be an increase in student learning and a more informed instructor.

References

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Appendix A

EXAMPLE OF THE MISCONCEPTION/PRECONCEPTION CHECK CAT

Module 6 Spot Check: Misconception/ Preconception CAT

This is not a graded assignment; however, your response counts towards participation.

This week we will discuss the module objectives and how the assignments and grading scales play a part in the assessment of your learning.

Have you had a chance to implement these newly learned skills into your assignments yet? I understand that this class does not use a rubric, but this week's module gives you an example of a rubric. For some reason, there is always an issue with the worksheet assignment in Module 6. The most common problem I see in this class is that at least half of the students do not take the time to carefully read the directions for this assignment. I often get e-mails from students asking me where they can find the Cosgrove textbook for the assignment and some will even take the time to write a 500-750 word essay.

This is your chance to earn a quick participation point...

Open the directions for the Module 6 worksheet, "Understanding an Assignment," and tell me based on your readings what it is that YOU need to do complete this week's assignment and answer the questions below.

True or False: You need to read the textbook listed in the assignment.

True or False: You need to write a 500-750 word essay for the assignment.

True or False: All you need to do is to answer the eight questions at the end of the assignment.

Author Biographies

Rick Holbeck earned a Bachelor's Degree in Secondary Music Education from Bemidji State University (Minnesota) and a Master's Degree in Educational Leadership from Southwest Minnesota State University and a Master's Degree in Curriculum and Instruction with an emphasis on Technology from Grand Canyon University. He has also finished the coursework for a PhD in Educational Leadership at Walden University and is currently in a doctoral program at Grand Canyon University in Higher Education Leadership. Rick began teaching adjunct classes for Grand Canyon University in February of 2010 and moved to a Full-Time Online Faculty position in August, 2010. Rick held the position of Manager of Online Full Time Faculty for about two years and has recently transitioned to the role of Director of Online Full Time Faculty.

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Sheila Lees completed her Bachelor of Arts in Elementary Education from Arizona State University and her Masters of Educational Leadership from Northern Arizona University. Sheila has 8 years of experience in education. She started her career in education beginning in K-6 and moved to Grand Canyon University in August of 2012. She began her career at Grand Canyon University as a Full-Time Online Faculty member and has since moved to the position of Manager for Online Full-time Faculty. Sheila also is an adjunct instructor for the ground campus for Grand Canyon University.