The Need for Alternative Authentic Assessments in Online Learning Environments

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Abstract

The question to be addressed in this paper is: *Are we measuring what is important?* A test grade does not necessarily tell us what a student knows because these traditional assessments generally concentrate on the lower end of the learning taxonomy. Traditional tests seldom measure the complex learning outcomes in an online student-centered instructional model. Computers provide a richer way in which to foster student learning, and, at the same time, a richer way in which to assess the outcomes of such learning. The need to reflect a more contemporary perception of instruction and student learning has precipitated a changing view on how to assess students in all learning environments.

Keywords: student-centered, teacher-centered, authentic assessment.

Introduction

The Internet is rapidly transforming the way people engage in commerce, socialization, and education. This relatively new interactive learning environment provides a more learner-centered setting that promotes knowledge construction and independent learning. Indeed, many companies and educational institutions are investing significant resources into the development of an Internet-capable infrastructure that will facilitate the delivery of courses in a Web-based format. Despite the current bandwidth limitations that often make for slow data transmission, Web-based instruction increasingly appears to be the format of choice for most distance education.

At the same time this evolution and embracement of technology is taking place, the face of the college student is changing (Mulligan & Geary, 1999). A growing number of non-traditional students are seeking post-secondary education because employers are demanding more highly skilled workers (Reeves, 2000). The flexibility offered by distance education via the Internet is the only possible solution for many non-traditional students to obtaining additionally needed education; the use of Web-based distance education is bound to increase. As the environment changes for the delivery of instruction, it is important to re-evaluate the ways in which we assess the learning outcomes for students using this new format and develop and apply assessment techniques that are more consistent with the learning environment (Reeves, 2000). In fact, there has been an increased awareness of the need for more authentic assessment throughout education, not only for distance education formats (Linn, Baker, & Dunbar, 1991).

Learning is a complex phenomena and measuring it, equally so. In general, higher education has valued, and thus focused on, the retention of verbal knowledge and limited-context application of that knowledge (Reeves, 2000). Many teachers, if not most, have no training whatever in assessment techniques of any kind. As a result, teachers who have moved to online instruction have brought with them outdated concepts of assessing the learning that is taking place—they simply digitize traditional tests. Conventional testing techniques, such as multiple choice, true-false, or short answer questions have been and continue to be used to assess learning achievement because they are relatively easy to construct, are easy to grade, and typically yield a wide distribution of grades that gives teachers the impression of validity (Reeves, 2000).

The question that needs to be asked and answered is: "Are we measuring what is important?" A test grade does not necessarily tell us what a student knows because these traditional assessments generally concentrate on the lower end of the learning taxonomy. Traditional tests are not likely to measure the complex learning outcomes in an online student-centered instructional model, which are fundamentally different from teacher-centered instruction (Reeves, 2000). Unfortunately, many teachers resign themselves to using tra-

ditional methods because it is more difficult and time-consuming to assess higher order thinking than to assess inert declarative knowledge and skills. Computers provide a richer way in which to foster student learning, and, at the same time, a richer way in which to assess the outcomes of such learning. The need to reflect a more contemporary perception of instruction and student learning has precipitated a changing view on how to assess students in all learning environments.

Defining Assessment and Evaluation

It is common for people in the education field to use the terms "assessment" and "evaluation" interchangeably—as if they mean the same thing. A review of the literature establishes that there is a lack of accepted definition for these terms. Reeves (2000) claims that the two terms have distinctly different meanings. Assessment, he says, is the measure of student learning or human characteristics; i.e., we assess people. Evaluation, on the other hand, is the measure of effectiveness for a program or product; i.e., we evaluate things.

One reason that the two terms are confused is because we can and often do use the same data to analyze student learning and a program's worthiness. The terms are further confounded because research literature often uses the two terms in the same context. There is a need in the literature regarding this arena to have a generally accepted definition for both assessment and evaluation. This paper follows Reeves' recommendation and refers to measuring student learning as assessment and to measuring program effectiveness as evaluation.

The Need for Valid Assessment

There are several important reasons to measure the genuine progress of a student through a course regardless of the delivery system. First, students' grades are often summative assessments used in important life decisions, such as obtaining admission to certain desirable schools or maintaining scholarship funding (Reeves, 2000). Second, similar to evaluation in the instructional design process, assessments can also serve as formative feedback to provide student support by identifying areas that need additional attention to guide the student toward a successful conclusion to the course. Third, as previously stated, the data collected from student assessment can be used as formative or summative evaluation data to guide the instructional design process for a course. Fourth, businesses expect identifiable quality outcomes when they invest financial resources into the further education of employees. Finally, accreditation and licensure in some fields requires the measuring of acceptable levels of learning (Reeves, 2000).

In distance education, there is a shift of the roles of student and teacher where students are required to be active and take more responsibility for their own learning (Mulligan & Geary, 1999). This role shift has prompted a growing interest in the need to assess different kinds of outcomes—higher order thinking and critical analysis. Research has identified several new ways in which to implement alternative assessment methods that will address these kinds of outcomes: writing, cognitive assessments, performance assessments, and portfolios. These methods are also known as authentic assessment because they purport to measure students' ability in realistic situations that would call for the skillful application of specific knowledge.

Writing

Writing is a major means of communication in on-line courses—both student-teacher, and student-student interaction (Mulligan & Geary, 1999). Web-based distance learning heavily promotes the use of reflection and writing as a means of learning and as a way that teachers come to know their students. Email and threaded discussions are typical components of on-line courses. This aspect of on-line communication provides teachers with a means of observing a student's progression.

One research study showed that on-line students wrote as much as ten to forty times the volume of work that students did when in a comparable traditional class (Mulligan & Geary, 1999). These researchers categorized the total writing generated during a semester into three categories of writing: formal assignments, general class discussions, and meta-discourse (informal discussion about the course). All the categories of writing were found to contribute to student learning because, even in the informal discussions about the course, students were required to devise communication that conveyed their concerns by addressing different types of audience members.

In class discussions on given topics, students needed to create a context for their writing, even when responding to other students writing. When proper guidelines are established, they can lead students to engage others in thoughtful, meaningful discourse. Because responses can be edited and polished before posting, students have time for greater reflection and discussions are typically more sophisticated and refined (Mulligan & Geary, 1999). Branching of ideas in threaded discussions can reflect the depth of understanding of concepts or the need to provide additional supportive information. Another form of writing that can be used in distance education is journaling. Journaling facilitates reflective analysis by students and allows the teacher to view how students are interpreting information (Mulligan and Geary, 1999).

Not only did the volume of student writing increase in on-line formats, but the quality of writing also improved when students frequently received quality teacher feedback (Prestidge & Glaser, 2000). Mulligan and Geary (1999) noted one case where objective-writing scores proved misleading. In that study, grade-level scores to measure readability increased dramatically for some students, but declined for other. Upon closer analysis, the students whose readability scores had declined were the weaker writers who actually improved the clarity of their writing. Thus, it is important to approach assessing students' work with more than a simple, objective, computer-generated analysis of student work; it is not likely to provide a true picture of a student's achievement.

Cognitive Assessments

Another major direction that alternative assessment can take is that of cognitive assessment. Concept mapping is one method of cognitive assessment that has shown great promise for reflecting student's understanding (Reeves, 2000). This tool allows students to diagram their structural comprehension of ideas and delineate the relationship among the components. Concept maps can also be used to monitor students' progress when collected and analyzed over time. The revised concept maps show what new knowledge students have acquired and how they anchor the new knowledge to their existing knowledge (Reeves, 2000). As assessment tools, concept maps show not only what students have properly grasped, but also what misconceptions students harbor among related ideas, or what correlations they may have missed. Some educators challenge the face validity of concept mapping for assessment, but many teachers have found concept maps a useful tool for both implementing instruction and assessing learning (Reeves, 2000).

Multimedia projects can be considered a type of cognitive assessment and have also been used by some teachers both to implement instruction and to assess student learning. Multimedia projects require that students build research skills; critically analyze data to select relevant details; synthesize information; and, select and arrange information to validate or disprove their ideas. Socialization skills are required when projects are team efforts. Students must communicate effectively and negotiate for or defend ideas that they want included in the final project (Prestidge & Glaser, 2000).

Multimedia projects are one tool that can help provide a more authentic assessment of student learning because it can capture the depth and breadth of a student's understanding and it allows for viewing a student's growth over time (Prestidge & Glaser, 2000). Traditional assessment tools cannot capture this perspective of a student, nor can it determine an individual's participation in a group endeavor.

Problem-solving simulation is another cognitive assessment tool that has shown promise in gauging student learning (Dean & Webster, 2000; Reeves, 2000). Simulations attempt to present the student with situated learning by integrating real-world elements into the learning environment. Simulation packages include a decision support system that guide students through learning and practicing the application of their knowledge to a variety of complex real-life situations (Dean & Webster, 2000). When students can apply what they have learned to devise unique solutions to novel problems, they demonstrate a deep understanding of that knowledge—evidence that meaningful learning has taken place.

Performance Assessment

Performance assessment allows students to directly exhibit their mastery of knowledge by creating a product or participating in an activity that has value in its own right (Reeves, 2000). It is a challenge that requires the proficient application of knowledge and critical reasoning to vaguely defined problems (Linn et al., 1991; Reeves, 2000). During performance assessment, students should be presented with new problems that they have not previously seen. As with simulations, the student is required to consider the whole body of knowledge that they have learned and discriminate among all that is there to select the appropriate concepts, principles, and procedures to apply to the new problem. The student is also required to engage in critical analysis to properly sequence a successful solution to the problem. If one were teaching students to make a cake, one could require that a student apply his baking knowledge to produce a new kind of cake as evidence of his cake-making ability. This indirectly tests students' knowledge on all the relevant concepts, principles, and procedures required in cake making by assessing an end product that employs all the requisite knowledge.

Reeves (2000) identifies five key attributes of complex, performance-based assessment: 1) the focus is on complex learning, 2) the learner employs higher-order thinking and skills, 3) the student is encouraged to reply with a wide range of responses, 4) the problem is of sufficient complexity that it requires a multiple step solution; and, 5) the problem is of sufficient complexity that the student must devote significant time and effort to a successful solution. Producing unique projects requires students to go beyond demonstrating the retention of verbal knowledge or simply identifying correct skill usage in limited, well-defined scenarios.

Another approach to online assessment is electronic portfolios. Portfolios contain a collection of

the student's work as it evolves over time and have been used for a long time in certain professions such as art, architecture, and engineering (Reeves, 2000). The construction of portfolios can take a variety of directions. Sometimes, portfolios contain randomly selected pieces of a student's work; other times, they might contain only samples of the best work. Sometimes, the teacher selects the pieces to be included; other times, the teacher and student collaborate to arrive at a decision on what is to be included (Linn et al, 1991). Reviewing the portfolio reveals not only the solution at which a student arrives, but also the process of that journey. This takes the focus away from merely obtaining the "right answer" and emphasizes the importance of using complex cognitive processes to construct a valid solution (Reeves, 2000).

Barriers to Alternative Assessments

While alternative assessment tools appear to have a greater fidelity to the learning environment, they are not without disadvantages. Grading alternative assessment can be far more subjective than many students and teachers would like (Reeves, 2000). Scoring rubrics can help address this issue (Prestidge & Glaser, 2000). Rubrics can lend objectivity to the assessment process and to provide students with clear outline of expectations for assignments. Another difficulty is that authentic assessment tools have little research to substantiate their validity (Linn et al, 1991). Many individuals are skeptical of the quality of online instruction to begin with, and they want to know how valid these techniques are as a genuine measure of learning. One other identified barrier involves the size of classes. Many administrators see online classes as an opportunity to have larger classes that are not constrained by physical classroom size. When the student-to-teacher ratio is too high, the advantage of this fruitful learning environment is easily lost (Mulligan & Geary, 1999) and the quality of assessing is easily compromised time and attention for development and conscientious grading.

Conclusion

The nature of student-centered online learning requires a reassessment of techniques used to measure achievement in this new learning paradigm. If alternative assessments are to find a place in online learning, administrators must be committed to training teachers not only how to put a class online, but also how to use authentic assessment tools for measuring higher order thinking outcomes. Administrators must also be prepared to restrict class sizes so that teachers can capably examine and assess learning. There is a dearth of studies regarding alternative assessment. Thus, continuing research must be conducted to investigate the validity of these techniques and the varying ways in which they are implemented.

As online instruction continues to grow, it is critical to consider that although computers can provide rich learning experiences and environments, it does not automatically follow that rich learning will take place. However, if rich learning *is* taking place, we must continue to ask if we are measuring what is really important, and how we can expand the framework to best measure this meaningful learning.

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