Using Online Formative Assessments for Improved Learning

Barbara F. Cherem

Abstract
This article explores the use of formative—process driven—online assessments and argues that, done correctly, these assessments can improve student learning outcomes for any teacher who uses an online course management system (CMS). Although the methods of, and implications for, the use of formative assessments as described here are applicable to all teachers, this article describes their use with teacher education candidates in a special education graduate program. Using assessments for learning, rather than assessments strictly of learning, is particularly helpful when one considers today’s rapid-paced and frequently reduced face-to-face classroom time. Such assessments also help reduce performance-inhibiting anxieties of certain overly anxious adult professionals who return to the classroom with a professional identity at some risk. Such lower-stakes formative assessments establish a more comfortable learning environment and increase students’ potential for success on the summative final exam. Not only can the application of assessments in this manner be extremely beneficial in any subject, but it is also valuable for gauging and accelerating the learning of any level or type of student.

Keywords
formative assessments, online learning, pre-assessments, adult learners, mixed-mode learning, motivation.

Introduction
A decade ago, one of the prominent mantras in assessment circles was the use of assessment for learning (formative), rather than merely as evaluators of learning (summative) (Stiggins & Chappius, 2005). Historically, summative evaluation has been the predominant focus of student assessment. As explained by Chappuis and Chappuis (2007/2008), this type of testing merely “documents how much learning has occurred at a point in time; its purpose is to measure the level of student, school, or program success” (p.15). Alternatively, formative assessment is process driven. As described by Smith (2007), “formative assessments continually assess students’ learning progress […, providing] feedback to students and instructors that determines the
course of subsequent teaching and learning activities” (p. 31). Practicing this type of assessment implementation transforms testing into something more than simply a means of determining grades for students’ performance. Formative assessments are functional—they increase proficiency and focus in planning, reduce student anxiety, give students an added sense of ownership in their development, and, ultimately, promote the comprehension of the course content (Smith, 1997; Stiggins, 1997; Stiggins & Chappuis, 2005; Stiggins & DuFour, 2009; Wlodkowski, 2008).

From 1997–2004, I directed assessment activities for a P-12 public school district that served approximately 12,000 students. During this time, one of the core values of the district was the importance of formative assessments as tools for teaching rather than mere evaluations. Being opposed to tests merely for end-of-unit grading purposes, Stiggins (1997) can, to a large extent, be credited for beginning the movement toward transforming assessment into a teaching tool and for becoming one of its most prominent advocates. Prior to Stiggins’s (1997) early publications, the research literature on this subject was sparse. Because of this, few schools attended to the use of assessments for formative purposes.

Background on Value of Formative Assessments
In the late 1990's, many researchers and practitioners of educational theory began exploring, and eventually supporting, the notion of assessments as tools for learning. Classroom assessments for learning initially started attracting attention because it became clear that, unlike assessment with a summative purpose, formative assessment (a) had a purpose more intimately tied to teachers’ instructional goals; and (b) presented a potential for improving student learning which was more immediately evident, as well as instructionally relevant (Knowles, 1984). Such assessments provide a greater level of teacher autonomy and are more contextually linked to their classroom’s curriculum. In addition, they are an effective means of teaching a wide variety of students in varied learning environments such as both online and face-to-face classes.

When I returned to teaching in higher education three years ago, I was charged with utilizing mixed-mode courses—those which are taught in class as well as online, in alternate weeks—to prepare teachers at the graduate level. One of the first advantages of this mixed-mode or “blended” learning that I recognized was the ease with which one could determine “the end.” For instance, through online pre-assessments, one can identify what areas are fairly well mastered by a particular group of students as well as those which are in need of greater attention. Such pre-assessments provide effective, immediately applicable feedback and point out the strengths and weaknesses of the student group. According to Chappuis and Chappuis, “feedback in an assessment for learning context occurs while there is still time to take action” (p.15). The pre-assessment and the monthly formative quiz of content knowledge are two types of formative assessments which are particularly suited for online use.

Pre-Assessments: Why Online Works so Well
One of the most significant benefits presented by the use of pre-assessments is time efficiency. In contrast to traditional methods of assessing students’ knowledge and skills, which are usually time-consuming and difficult to implement, online pre-assessments allow instructors easy access to that information. Because students complete such assignments before the first face-to-face (F2F) class even occurs, an instructor is able to gain insight into their knowledge base prior to the actual beginning of instruction. This results in several important outcomes, the most useful being the ability to identify which students are experienced and which are novices.
Although identifying students’ varied levels of understanding is an extremely important factor at any level of instruction, it is particularly vital when teaching in higher education (Renfro & Grisshaber, 2009). College teachers often face a student population with wide-ranging ages and skill levels. These elements of student readiness become especially pertinent to one’s instructional plans when students are part of an education program. For example, students are as likely to be mid-career, experienced classroom teachers as they are to be pre-service neophytes with little field experience.

When considering the substantial benefits of collaborative learning, as well as its developmental potential, it becomes particularly important that an instructor is able to efficiently identify and create groupings of a diverse nature, such as pairing experienced students with novices (Huebner, 2010). Pre-assessments allow teachers to do so quickly and easily. Introductory discussion board posts (e.g. “Getting to Know You”)—common to many online courses—may get to some aspects of this experience; however, the higher quality of objective evidence gained through online pre-assessments (i.e., an accurate read of students’ content knowledge) offers more substance and reliable information for an instructor. The various settings in which some teachers have taught are equally diverse in their varied demands and types of experiences—for instance, charter schools and/or P-12 public schools versus alternative community education settings. The pre-assessment adequately screens for these significant differences in a way that the self-disclosing, introduction-type discussion thread cannot.

An additional function of the pre-assessment is that it allows one to identify common deficit areas in the class of incoming students. Through online assessments, the opportunity for quick item analysis is enhanced. Because of the vast differences in students’ common knowledge bases, discovering what students know and what essential information and concepts they lack is key to planning a successful instructional program. This point is clearly illustrated within the daily proceedings of any higher-education classroom; some students enter courses fairly knowledgeable about the material already, while others have practically no familiarity with basic concepts. It is common in the University of Michigan’s special education courses for a percentage of teachers to arrive in class with an extensive knowledge of parental rights because they are parents of children with special needs. Conversely, others may have had experiences as special education classroom paraprofessionals and may have a deep knowledge of other aspects of school policies and practices related to special education. Clearly, such a mix of prior knowledge and experiences poses an important challenge and opportunity in the learning environment (Park & Choi, 2009). Online pre-assessment allows instructors to tailor their courses to the needs and level of each new class, thereby implementing a student-centered mode of instruction based in part on that “quick identification” of focus areas. Especially when considering the reduced F2F class time characteristic of online courses, it is imperative that all class time be used wisely (Rovai, 2000).

Lastly, instructors are able to use pre-to-post assessments to document students’ success in meeting required objectives, an ability useful for any site with accreditation needs. These online pre-to-post assessments also allow the tracking of individual growth—a topic of interest to the instructor as well as the students. Pragmatically, they also allow for the easy charting of students’ collective growth. More importantly, the exit scores actually reflect students’ competence. Under the reauthorized Elementary and Secondary Education Act (ESEA-2001), the federal law also known as “No Child Left Behind,” all teachers must pass state qualifying tests. Thus, Education Departments have an obligation to prospective teachers to prepare them for these exams. With the information about their strengths and weaknesses provided by these
assessments, students can identify the areas they need to concentrate on when they prepare for state teacher exams and certification assessments.

**Formative Assessments as a Means to Reduce Anxiety**

One especially prevalent characteristic of teaching graduate-level adult students is that these learners are typically extremely motivated (Knowles, 1984). Ironically, this has become a dual-edged trait; when adult students’ motivation becomes overly high, it poses an obstacle to their learning development. As brain research indicates, the presence of anxiety “downshifts” the brain’s processing so that it functions more slowly. Additionally, it interferes with the brain’s ability “to learn, solve problems, and grasp new ideas” (Lantieri 2008, p. 3). In an attempt to discover how to eliminate the negative effects of this driving force without detracting from the good stress that fuels their motivation, I formulated a hypothesis, based on an analysis of adult-learner anxiety levels, about why the anxiety levels were so high and what could be done to reduce student anxiety without lowering their motivation and learning goals. By making a transition in assessment pedagogy from a summative orientation to a lower-stakes formative one, an instructor is able to address both of these purposes.

In reflecting on adult learners’ potential for undercutting their own performance as a result of accelerated levels of anxiety, it became apparent to me as early as 1989 that adult students’ sense of self-efficacy in their home lives as workers, spouses, or parents was correlated with the degree to which they placed their egos at risk by returning to school. Knowles (1984) was one of the first researchers to begin to document the importance of this factor, increased self-at-risk variable, as commonly affecting student achievement. For example, graduate students admitted to the Special Education Program at the University of Michigan–Flint were often competent teachers accustomed to leading a class. The pressure of having to maintain their self-image placed them at even greater risk when re-entering the classroom as learners. Wlodkowski (2008) explained that “adults want to be successful learners. This goal is a constant influence on… [their ability to learn] because success directly or indirectly indicates their competence” (p.100).

During the 1980’s, there was an emergence of research on the distinctive characteristics of adult learners as unique from younger students; the body of literature on the theory of adult learning—“andragogy,” as coined by Knowles (1984)—brought these distinctions to the fore. More recently, many others have begun stressing this critical feature of adult learners (Ruey, 2010; Zemke & Zemke, 1984). In his discussion of adult learners and at-risk egos, Wlodkowski (2008) explains, “If adults have a problem experiencing success or even in expecting success, their motivation for learning will usually decline” (p.100). And according to Mordkowitz and Ginsburg (1987), “adults pay keen attention to indicators of success while they are learning” (qtd. in Wlodkowski, 2008, p.100). Unlike younger undergraduate students, who, often, have yet to assume the roles characteristic of adults, these students (adult learners) have something quite real to protect, or lose, in the classroom setting: their well established sense of self as competent adults.

When the adult learners reentering the classroom setting are teachers—individuals who are accustomed to being in charge of a class of students rather than being students, themselves—this sense of vulnerability can increase considerably. Consequently, the anxieties driven by a fear of failure, as well as the implications of such failure, can become a significant detriment to learning and development. I have found this supposition to be particularly accurate and clearly exemplified within UM-Flint’s teacher preparation program.

Yet this fear of failure can produce, at least to a minor extent, positive outcomes as well: it fuels moti-
vation. I believe that concern for the preservation of self-image drives the desire to not only complete, but to excel in school. This concept of failure-driven anxiety places formative evaluations in a particularly attractive position; it reduces the pressure and allows for students’ thought processes to become fully engaged without interruption by their fears of inadequacy (Ioannou & Artino, 2010). Online formative evaluations are, in a sense, more privatized attempts to learn; and, when given an opportunity to make multiple attempts and have the scores of each averaged, they provide a much greater opportunity to achieve a high level of success (Rovai, 2000). Generally, although it is not guaranteed, once students have taken the quiz the first time, it is completely within their ability to obtain a perfect score on the second attempt.

In my mixed-mode courses, formative assessment practices are an integral element of the instruction. For example, students are given two attempts on their monthly open-book review quizzes. Implementing this system of formative testing throughout the semester gives students the opportunity to (a) study before each of the first attempts on the review quizzes; (b) complete the test, view the results, and use the information to redirect further study before the second attempt; (c) retake each quiz; and (d) use the results of the second attempts to advantage in preparation for the cumulative final. In addition, because all items on the summative final exam are drawn from the monthly formative quizzes, the opportunity for students to achieve mastery of the content is substantially increased. This strategy—using the content from the quizzes as “feeder items” for the final exam—has proven to be extremely beneficial.

There are several variables which affect students’ success rate when using formative assessment. Unlike summative testing, which merely indicates the content areas in which a student lacks understanding, formative tests give students an opportunity to (a) realize which areas of the content they need to further explore; and (b) go back and learn that content. It is because of this fact that students seem willing to reinvestigate the areas of the content which they had not fully understood before the first attempt. This then serves as a significant variable influencing students’ ultimate success. As asserted by Smith (2007), “Formative assessment does not benefit all students if they do not fulfill their responsibility to learn” (p. 32). For instance, when students are given a specific number of attempts, and one averages the scores rather than using a substitution model, this system becomes one which encourages studying before each attempt.

Implementing this method not only encourages multiple study sessions, but also serves to combat the element of anxiety which can interfere with the student’s accurate demonstration of his or her comprehension. These efforts ensure that the summative final is an evaluation which gauges the students’ understanding of the intended objectives of the course. Such an approach also makes certain that the final assessment is representative of the course’s effectiveness; it serves as a literal summation of the content learned, as opposed to one which is more reflective of what content was perceived to be covered by the instructor.

In my courses, the final exam is worth twenty percent of the overall grade, and it is administered during class on laptops. The most beneficial aspect of this type of online final assessment is that students are given immediate feedback on their results. Once students submit their final answers, the assessment is scored, with the results open to the student for review. The positive impact of immediate feedback has received a great deal of attention; it has nearly unanimous support as best practice throughout the educational community (Chappuis & Chappuis, 2007/2008; Phelps, 2010; Renfro & Grieshaber, 2009; Smith, 1997; Stiggins, 1997; Stiggins & Chappuis, 2005; Stiggins & DuFour, 2009; Wlodkowski, 2008).
Although students remain quite serious about their initial preparation for the quiz, they express a high level of appreciation for the opportunity to take these process-driven quizzes a second time. After they receive the results of a test, students have a week to request a second chance. Knowing that they can repeat quizzes also helps to alleviate the pressure of having their egos or grades “at risk” and so to diminish feelings of incompetence. With anxieties relieved, they can focus more directly on the content of the course, and the evaluations are more likely to reflect the strengths and weaknesses of the course structure and materials, rather than their anxieties. Providing such effective assessment practices eliminates the element of uncertainty and, consequently, lowers the likelihood that failure-driven anxiety will negatively impact students’ learning experience.

Some faculty members may perceive the practice of offering second attempts as compromising the integrity of the evaluation’s results, seeing it, at minimum, as being inappropriate and, at worst, as condoning cheating. Yet in actuality, being given the opportunity to learn from one’s mistakes promotes that which is at the core of the educational system: the opportunity of learning from one’s mistakes and thereby developing genuine competence (Chappuis & Chappuis, 2007/2008; Phelps, 2010; Renfro & Grieshaber, 2009; Smith, 1997; Stiggins, 1997; Stiggins, & Chappuis, 2005; Stiggins & DuFour, 2009; Wlodkowski, 2008). This strategy also helps to deliver the message to students that the institution and instructor are “on their side.” It makes the statement that their instructor’s emphasis is on development, rather than on test-taking ability. In teacher preparation programs, it also serves the added benefit of being a model of effective assessment practices for teacher candidates to draw from and implement in their own classroom. These benefits are the basis for the promotion of formative assessment integration. While the use of only summative assessments can often pose a barrier to development and to students’ success in general, a pedagogy which favors formative evaluation fosters genuine learning (Stiggins & DuFour, 2009).

Summary

Although the concept of implementing assessments for learning as opposed to assessments of learning is not a new concept, it is certainly one that has the potential to produce a multitude of desirable results. In my experience with adult learners, the use of online formative assessments has been extremely beneficial to students’ success. Motivation, as well as the ability to process information and create meaning, is strongly affected by anxiety. It is also evident that those most affected by these types of pressures are students who are particularly motivated learners, as well as those who have fully developed professional identities. I have found that, with graduate teacher education students, the use of formative assessment practices is an invaluable and highly beneficial method of enhancing student understanding and promoting success.

References


Cherem – Online Formative Assessments


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