

Promoting Formative Assessment in Online Teaching and Learning

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Abstract

Using effective assessment techniques can improve an instructor's understanding of student needs and support learner-centered classrooms. Evaluating student learning takes on a new meaning in online classroom environment where students and instructors do not share physical proximity. According to Garrison (2011), the assessment strategies used to determine student learning send "a very strong signal as to what is important and how they should approach learning" (p. 14). This paper describes formative assessment techniques used by two instructors in their respective online courses at the graduate level. The authors give suggestions in designing assessment activities to improve online teaching and learning by making use of student learning data.

Keywords: Formative Assessment, Assessment for Learning, Online Learning

Online learning invites "the reconstruction of student and instructor roles, relations and practices" (Vonderwell, Liang & Alderman, 2007). Faculty need to understand the pedagogical characteristics of online learning and the tools used to deliver or mediate online learning. Calibrating assessment to meet the characteristics of online instruction becomes an issue, particularly when attempting to adapt formative assessment techniques used in a traditional face-to-face classroom. Instructors need

to identify effective assessment methods appropriate to online learning and understand the potential of technology tools for monitoring student learning and their own teaching. It is important to explore how assessment techniques can be used to make the feedback loop between instruction and assessment more meaningful (Mandinach, 2005). Formative feedback can foster student engagement, improved achievement and enhance motivation to learn (Crisp & Ward, 2008).

Assessment literacy is an instructor's set of skills focused on the development and implementation of assessment tools intended to provide information about students' growth and progress (Wilén, Hutchinson & Ishler, 2008). According to Garrison (2011), assessment has a "subtle but pervasive influence in shaping intentions and how students approach an educational experience... How students are assessed sends a very strong signal as to what is important and how they should approach learning" (p. 14). Assessment literacy is an integral part of student-centered pedagogy (Wilén, Hutchinson & Ishler, 2008), thus becoming key to continuous improvement for both instructors and students in any teaching and learning system. Instructors need to view assessment as a multidimensional process. For instance, "asynchronous online discussions facilitate a multidimensional process of assessment demonstrated in the aspects of discussion structure, self-regulatory cognitions

and activities, learner autonomy, learning community and student writing skills” (Vonderwell, Liang & Alderman, 2007, p. 321). Such components in the instructional design process need to be taken into consideration when developing and implementing assessment tasks.

The main purpose of assessment relates to the continuous improvement of instruction in two important ways: a) it provides the necessary data for teacher accountability purposes; and b) as “an integral component of the teaching process” (Reynolds, Livingston, & Wilson, 2006, p. 2), it supports a reflective and pro-active approach to the whole teaching and learning process. “High quality assessment” (Chase, 1999, p. 9) is an essential part of teaching effectiveness by engaging students and their instructors in a wide range of learning opportunities that acknowledge student achievement, while informing changes in instructional plans and strategies, as well as leading to curriculum improvements.

Assessment includes all activities that teachers and students undertake to get information that can be used diagnostically to alter teaching and learning (Black & William, 1998). There is a distinction between assessment of learning and assessment for learning. Assessment of learning is focused primarily on assigning grades as the principal indicator of student performance, in a teacher-directed manner. Summative assessment is when the students’ status with respect to educational variables of interest is determined (Popham, 2002). The purpose of assessment for learning is to “enable students through effective feedback, to fully understand their own learning and the goals they are aiming for” (Elwood & Klenowski, 2002, p. 243). William and Black (2004) call for embedding formative assessment in the curriculum. Embedded assessments are intended to focus teaching and learning on the goals of the curriculum and provide feedback to students as to how to close the gap in their knowledge between what they know and what they need to know (Black & William, 2004). Assessment becomes formative when the information is used to adapt teaching and learning to meet student needs (Boston, 2002). Summative or formative, assessment plays an important role in the learning process.

The delivery mode of instruction does not alter the fundamental principles of assessment (Benson, 2003, p. 71). Assessment leading to continuous improvement is important for the development of an engaged community of learners in the online environment (Beebe, Vonderwell, & Boboc, 2010). At the same time, assess-

ment data guide the design of online courses by using a variety of tools, both traditional and alternative, such as self assessment and peer assessment, as well as tasks that encourage student critical thinking and collaboration (Herron & Wright, 2006). Under these circumstances, a wide range of assessment strategies to provide multiple opportunities for learners and instructors to evaluate learning at different entry points in the complex instructional process. “Effective assessment techniques can improve an instructor’s understanding of student needs and provide the development of a learner-centered classroom” (Beebe, Vonderwell, & Boboc, 2010, p. 6).

Formative assessment techniques can also provide ways for the instructor in assisting students in their help-seeking process as an important metacognitive skill (Nelson-LeGall, 1981; Newman, 1994). In their study, Beebe, Vonderwell, and Boboc (2010) found that online learning requires greater initiative on the part of both instructor and students in the process of the assessment of learning. Instructors who teach online felt that if students do not ask questions, they did not have sufficient informal ways of understanding whether student learning is taking place or not. Integrating formative assessment techniques, formal or informal, can assist student in their help-seeking process and enable self-regulatory conditions and activities such as self-assessment and reflection.

Given the increasing complexity of requirements for a relevant curriculum preparing students for work in the 21st century world, assessment strategies need to balance out traditional and alternative approaches to evaluation of student performance. Under these circumstances, formative assessment provides instructors with a more accurate representation of student gains in terms of knowledge and skills by using various strategies during the instructional process. Consequently, active learning is promoted by means of accommodating students’ different learning styles, preferences, needs, and interests. At the same time, self-assessment, peer-assessment, collaborative work, and project-based learning are at the core of instruction, leading to a greater involvement of students in the evaluation of their own work and progress over time (Manning & Bucher, 2005; Powell, 2005).

The following examples represent select instructional practices by the two co-authors who have been using formative assessment to inform their own teaching and curriculum development.

Formative Assessment Examples in Online Learning Online Journaling

Used to evaluate student learning and progress, online journaling could be completed by students either individually, or in dyads, or even in small teams. Teaming students could be troublesome for some individuals, especially if journaling relies on peer input. In this case, pairing up should take into account the complexity and frequency of journal entries, how they could be tied to other course assignments, their overall weight toward a final grade, as well as prior student-to-student interactions. This may require gradual implementation and proper modeling of online journaling before students can fully engage in the learning opportunity. If online journaling is done in teams, assigning roles (such as chairperson/leader or devil's advocate, etc.) could help increase student responsibility and reflective critical thinking.

The questions that are used in online journaling need to be structured well. Careful attention needs to be paid not to overwhelm students by journaling that becomes too frequent. If online journaling is to be used frequently, the topics of discussion or guiding questions should be identified from a range designed to prevent repetition. At the same time, these discussion topics of guiding questions should be based on the course content and its learning goals.

Reflection Paper

Reflection can be used as an assessment and learning component. Instructors can assign students a reflection paper at the end of an asynchronous or synchronous discussion for analysis and reflection of the discussion content. In multi-threaded discussions, students may not be able to read all of the student and instructor postings on a discussion board. A reflection paper can include summary of the discussion, reflecting on classmates' posts and learning. Reflection papers allow students to internalize what they have learned through the discussions (Clark, 2000). Instructors can use student reflection paper as a way to formatively build on the following discussion and learning materials.

The Minute Paper

The (One) Minute Paper is a classroom assessment technique used for obtaining regular feedback from learners about their learning (Angelo & Cross, 1993). Student responses and reflections can provide instructors with a means to identify learning needs in their classrooms,

based on which to improve instruction. The (One) Minute Paper in an online classroom can provide an essential way for the instructor to check student progress and understanding. As online learning requires the reconstruction of student and instructor roles, relations and practices, instructors need to be aware of appropriate formative assessment strategies they can use to improve communication and student engagement.

Angelo and Cross (1993) suggest using two main questions in the (One) Minute Paper for classroom assessment: the first one directs learners to focus on what is being learned, while the second question seeks to determine how well student learning is proceeding. Below are two examples of Minute Paper questions:

- a) What is the most important thing you learned today?
- b) What question(s) do you still have in mind?

A variation of the (One) Minute Paper is the Muddiest Point assessment technique (Mosteller, 1989). One question that is asked in the Muddiest Point paper is "What was the muddiest point?" which intends to find out what students find most confusing or least confusing about the lesson.

Vonderwell (2004) used the Minute Paper format for online journaling with her students in her 10-week course. She wrote: "... implementing the online journals helped the instructor assess student learning and her own teaching and opened a communication line between the instructor and the students. Teacher and teaching presence was provided so the students would not feel they were secluded." (p. 30). One caution is to use diverse questions or goal-oriented questions rather than asking the same questions or implementing the Minute Paper in a timely fashion, thus avoid fatigue and information overload. Vonderwell (2004) further noted that writing for the journal was tedious for the students particularly towards the end of the semester.

Role Play

Instructor can assign students roles that they can assume in their discussion and study in an online class. Role play can help students to assess self and peer learning. Vonderwell and Zachariah (2005) found that assigning roles to students in online discussions such as facilitator, critical reflector (or respondent), and summarizer enabled students to monitor their peers' learning and progress. Students volunteered for the roles each week based on discussion topics. The instructor provided assessment criteria and

guiding questions to students to act as meta-cognitive guides. One finding indicates that the facilitator role enabled students to learn while mediating the online peer discussion.

Hook Questions

Based on a common pre-requisite reading, students are asked to come up with several questions that they could use to engage in a conversation on a topic selected from their reading material. The online instructor could identify the full range of interests students share by their choice of topics in which to ground the hook questions. At the same time, instructors could analyze these hook questions to determine the level of complexity along Bloom's taxonomy – factual/lower level vs. interpretative or probing/higher level. In case the online class features synchronous chat, the hook questions can be posted prior to a chat session as a way to prepare students for some of the focal points to be discussed. An analysis of the synchronous chat could also be posted once the session is over, thus emphasizing students' responses to the topics expressed by them as hook questions. Additionally, an analysis of hook questions may reveal misconceptions or confusion that would inform instructional planning for future online interactions either as part of an asynchronous discussion or a synchronous chat.

Things to Keep in Mind

These brief student messages are supposed to provide the instructor with a summary of a common pre-requisite reading that relies on one or more topics that students connect the most with. These messages could be posted online prior to a synchronous chat session which could be concluded by using some of them in an attempt to use student voices to support pertinent arguments made during the chat. Moreover, these "things to keep in mind" could be used as a list updated periodically, based on which subsequent online chat sessions could reiterate or reinforce particular topics. If these two strategies are to be used in tandem, students may be asked to connect the "Things to Keep in Mind" to the Hook Questions" they generated on the same reading material, very much in a pre-/post-test manner.

Questions Wall

A Questions Wall represents a distinct discussion forum in the online learning environment that could feature different questions from students and instructors. The main rationale behind using such an interactive tool is to allow students to create discussion threads based

on topics of interest to them, both related to the class content as well as its co-requisites and more general issues (some of which could be technical or logistical in nature). One reason for which a Questions Wall works well is the fact that traditional divisions between instructors and students disappear, thus enhancing online communication and interactivity. Therefore, there is no preset requirement in terms of frequency or topic of postings on the Questions Wall, which preserves its intended informal, non-structured nature.

Checking in with Students

Each synchronous chat session can start with instructors informally identifying any problems students may have had with a common pre-requisite reading, based on which the online chat dynamic may be changed to address that student feedback. In case the online chat agenda is already set, instructors could note student input on areas of progress as well as difficulty, which could be addressed separately upon the conclusion of the chat session or as part of an asynchronous discussion. As an alternative, instructors could review students' posted Hook Questions and/or Things to Keep in Mind, which would allow them to structure the online chat along topics to be revisited, reinforced, or investigated. In this particular case, it is very important to manage the size of the online chat group, so that each student could contribute to the conversation, thus providing the instructor with accurate information about his/her progress.

Considerations for the Design and Use of Formative Assessment Strategies in Online Classes

There are a few things to keep in mind when designing online classes to include formative assessment strategies as a way to maximize student participation and learning. First of all, it is very important for instructors to determine how much time they have to devote to these strategies, how frequently they are to be used, and how they are to be correlated to the official grading policy for the course. The purpose of these formative assessment strategies is to maximize student progress by offering frequent and relevant feedback to learners. Therefore, allowing for revisions to student work should also be factored into the time management plan for the whole class. For instance, if the course is to run for sixteen weeks with one 3-hour session each week, then the frequency of formative assessment strategies would be quite different com-

pared to a different class offered over eight weeks featuring longer sessions meeting more than once each week. In the latter case, the more condensed way of delivering curricula would suggest manageability as a primary criterion in the sequencing of such evaluative tools focused on student learning and interaction in the online environment. While early in the quarter or semester, formative assessment could be offered more frequently to establish the instructor's digital presence in the online classroom, later on the formative feedback offered to students could taper off to focus on students whose performance is not up to par or on topical strands of asynchronous conversations that could be connected to main course concepts, themes, theories, etc. By "checking in with students" via e-mail, asynchronous discussions, and/or online chats, instructors could make a determination related to students' pre-requisite knowledge base and skill set necessary to be successful in a given learning or assessment task, based on which to offer appropriate formative feedback.

Liang and Creasy (2004) studied instructors' assessment practices in online classes. They found that evaluating students' writing skills was confounded with more generic performance assessment, which made objective assessment quite problematic. In this case, instructors need to be mindful about distinguishing between the assessment of whether or not course objectives have been met by determining mastery of content and the assessment of student writing, which happens to be part of a course objective, but not the entire set of course objectives. One way in which the objective evaluation of overall student performance could be enhanced is to use scoring rubrics. At the same time, these evaluative tools could represent a meta-cognitive guide for students. By extrapolation, scoring rubrics could help both instructors and

students to manage assessment tasks and sequence the associated content. As far as formative feedback is concerned, multiple drafts of a course assignment could be discussed based on a scoring rubric during synchronous online meetings. Two of the examples shared in this paper – Hook Questions and Things to Keep in Mind – could be used to brainstorm ideas related to a major assignment, in which case the formative feedback to these two types of student online postings could include references from relevant scoring rubric items. This would introduce the evaluative tool to students, while negotiating with the instructor the contents of the major assignment related to the Hook Questions and Things to Keep in Mind that spurred the interest in a topic to write about.

Of equal importance to instructors should be the identification of appropriate ways to increase student participation in formative assessment strategies by means of self- and peer-assessment opportunities. This becomes not only a matter of inclusion in the management of an online class, but also one of determining how to connect self- and peer-assessment to the final grade. In other words, it has to be very clear to students how much of such feedback to themselves and their peers is to be taken into account toward the final evaluation of their course work. For example, a course that offers no extra credit option may include peer reviews of a major assignment that is submitted for summative evaluation by the instructor. A different strategy would be to use discussion for a where students could post their Reflection Papers mentioned earlier as a way to elicit formative feedback from peers. In this case, the instructor could guide the ensuing asynchronous conversation by identifying emerging patterns and/or by requesting clarifications or evidence from student to support their postings. A different variation of the

Reflection Paper could be used summatively by asking students to select a number of previous Reflection Papers they wrote for the course and focus on what appears to stand out to them in terms of growth and development in the academic content area(s) of the class. For instance, the prompt for the final Reflection Paper could emphasize some of the course-specific knowledge base or skills that students think they gained the most from. As an alternative, students could be asked to reflect summatively on what concerns they may still have with regard to the class content area(s) and what plans they may have to pursue these "questions not yet answered."

Instructors need to use diverse and a variety of assessment methods as well as questioning strategies and should be cautious not to use redundant methods. The time element and the duration of the assessment method can influence instructor and student motivation in participating in those assessment activities. The type of the questions asked is as important as the assessment strategy, particularly based on Bloom's taxonomy. For example, if Role Play is to be used every single session, after a while students may lose interest in participating effectively. A good pedagogical rule of thumb would be never to abuse any instructional strategy. At the same time, instructors could keep track of which of their strategies seem(s) to work well with a given group of students in preparation for future instructional planning and curriculum design.

Instructional design and technical considerations are interdependent, meaning that the online learning platform has to accommodate the nature of the class and its requirements for student success. An integral part of this planning process relates to the use of a comprehensive range of assessment strategies. Generating an assessment plan for the whole online class

helps instructors to map out their pedagogical strategies and materials. Consequently, student engagement and overall online interactivity are enhanced. In this case, it is useful to be aware of students' connectivity options, so that we do not heighten the digital divide by asking students to use technological tools that could not be readily available to them. One example that comes to mind has to do with the speed of Internet connection, especially when there are required online chats featuring multimedia presentations and synchronous tools of student engagement that rely on an adequate bandwidth not necessarily available to all students in a class. In this light, course requirements—both academic and technological—have to be clearly identified and communicated to students to allow them to find ways to maximize their course participation.

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