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Formative assessment helps students learn over time: Why aren't we paying more attention to it?

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Abstract: In the world of postsecondary assessment, summative practices take center stage, particularly at the program level. Formative assessment can be overlooked, for example, as institutions direct focus and effort toward fully implementing summative assessment for accreditation requirements. While summative practices are important, formative assessment is also worth promoting as a means to see improvements in student learning within a quicker time frame (i.e. over the course of a term instead of several terms or years later). With an intended audience of college faculty, assessment professionals, and administrators, this article summarizes ways formative assessment is employed to improve student learning and inform curriculum and program improvement. It also identifies barriers to formative assessment implementation and suggests ways those barriers may be overcome. One key strategy is faculty development, but the literature on faculty development about teaching with formative assessment is sparse and tends to be focused at the K-12 level, so we offer suggestions for a way forward by fostering professional development using best practices, ensuring equitable and culturally responsive assessment, and integrating formative assessment into larger efforts to support learning improvement over time.

Keywords: *formative assessment, metacognition, learning improvement, curriculum, program, professional development, equity*

Introduction

In the world of postsecondary assessment, summative practices take center stage, particularly at the program level. Summative assessment has been incorporated into accreditation standards and recent years have heralded a growing focus on learning improvement as a consequence of summative assessment findings (Jankowski et al., 2018). While summative assessment is indeed impactful and important, efforts to make programmatic changes to improve student learning using summative approaches can take several years of data collection and faculty discussion. This is problematic because too much attention to summative assessment can distract from a focus on formative assessment (e.g., class activities, formative use of rubrics, portfolios) and its alignment and integration with summative assessment. In other words, a too-narrow focus on summative assessment can mean missing out on

insights from formative assessment which can lead to more direct and rapid improvement in student learning (Singer-Freeman and Robinson, 2020). Capturing that rapid improvement could in turn further engage administration and faculty in student learning improvement efforts. For these reasons, formative assessment deserves increased attention and to be prioritized alongside, not separate from, summative approaches.

How can we, as faculty, assessment professionals, and administrators, use and support formative assessment as a means of obtaining more direct and expedient results that could lead to pedagogical improvement and consequently, student learning increases, in a course, across a curriculum, and beyond? Grounded in an overview of research on formative assessment, this article will explore strengths, weaknesses, opportunities, and barriers to implementing formative assessment. Suggested strategies for overcoming those barriers will be discussed. Throughout this work, formative assessment that is designed to engage students metacognitively will be emphasized. This work comes out of the Grand Challenges in Assessment implementation team focused on improving the measurement of student learning over time (Singer-Freeman, 2022). The focus of this paper on formative assessment used as a means of supporting improvements to student learning addresses significant gaps in the use of assessment data through formative assessments to improve student learning over time.

Formative assessment improves learning

Formative assessment is not a new concept; in 1967, Scriven coined the term "formative evaluation" and described how it differed from summative evaluation. In particular, formative evaluation was intended to gather information regarding curricular effectiveness and was solely meant to affect educational decisions. Black & Wiliam (1998) sought to expand the intention behind formative assessment, as they recognized the value that formative assessment can provide in determining if changes made within the classroom or curriculum were appropriate. Specifically, they considered formative assessment within a classroom to be any practice that collects information about student achievement and is utilized to adjust steps in instruction that are intended to be more effective than if that evidence had not been collected. In other words, formative assessment can be described as the use of low-stakes activities, along with the provision of ongoing and timely feedback on students' strengths and gaps, to continuously monitor student progress toward the intended learning outcomes throughout a course.

Formative assessment activities can include but are not limited to homework, class activities, assignment drafts, concept maps, minute papers, class discussions, peer review, and quizzes. In all their variations, formative assessments seek to capture whether, or the degree to which, students are making progress toward the intended learning outcomes so students and their instructors can adjust, improve, extend, or course correct before a summative evaluation takes place. Thus, formative assessment empowers real time improvement of student learning that cannot be accomplished through summative assessment alone (López-Pastor & Sicilia, 2017). These measures provide a clearer picture of student learning, for both students and faculty, and inform or suggest pedagogical improvements to facilitate, extend, and/or increase student learning.

Formative assessment that engages metacognitive methods (e.g., goal setting, planning, monitoring, evaluating, reflection) can both improve how well students attain the knowledge and skills immediately at hand (Chittum, 2018; Denke et al, 2020; Mynlieff et al, 2014) and boost retention and students' abilities to learn (Larmar & Lodge, 2014; Mahlberg, 2015; Ward & Butler, 2019). Some formative assessment approaches reveal to students how teaching and learning works and engage them more fully in the process. Rubrics, for example, can be used to stimulate student metacognition by helping students identify targeted ways to correct errors; they can also serve as a reference point as students plan and develop along a scale of development (Sáiz-Manzanares, et al., 2017; Tai et al., 2018). Online formative assessment that contains a sequence of low stake assignments has been shown to promote student engagement, learning outcomes, and metacognition (Chen et al., 2021; Ibabe & Jauregizar, 2010; Palmer & Devitt, 2014). Likewise, Transparency in Teaching and Learning (TILT), which involves providing students with clear feedback criteria for success in assignments before they do the assignment, has been shown to boost academic confidence, sense of belonging, and retention and completion rates, especially for underserved students (Winkelmes et al., 2016). TILT involves effective communication with students on the assignment, in terms of 1) clear goals around content, skills, and competences to be developed, as well as the real-life relevance of the skills, 2) helping students understand how to do the assignments/what steps to take, and 3) clear criteria of grading the assessment (e.g., a rubric) so that students will understand what success will look like. Other methods for engaging students in the formative assessment process include shared assessment, in which student and instructor engage in dialogue and collaboration about assessment and learning practice (students might, for example, provide feedback to the instructor on a draft rubric or a rubric could be built collaboratively); self-assessment, in which students evaluate their own work based on established criteria, either in addition to instructor evaluation or in lieu of it; and peer assessment, in which students provide feedback to one another in pairs or groups. When used formatively, such approaches can help students understand and interact with learning as a development process of practice, evaluation, reflection, and improvement (Mahlberg, 2015; López-Pastor & Sicilia, 2017; Zehnder et al, 2021).

Formative assessment is characterized by using feedback to monitor students' learning progress and helping students to develop metacognition; summative assessment, on the other hand, is characterized by using scores or other means to certify students' final achievement (Gikandi et al., 2011). Used effectively and in tandem, formative and summative assessment can and should inform one another. Summative and formative assessment should be aligned as part of course design. Formative assessment helps students improve in real time in their learning process as well as helping them improve their performance on a final summative assessment product (Robertson, 2019; Tur et al., 2019). Instructors can use results of student performance on summative assessment to identify strengths and weaknesses and pinpoint ways to improve pedagogical choices--including their choice of formative assessment and student feedback approaches--that are designed to improve learning for subsequent classes of students (Maki, 2017).

When formative assessment methods are aligned with expected program learning outcomes, they can support both individual student learning as well as continuous program improvement (Driscoll & Wood, 2007). Program assessment information that is systematically collected can be analyzed and used to allow programs to identify a) how well students as a group, or cohort, are learning, in terms of their knowledge, skills, abilities, and attitudes, b) what students are struggling with, c) what program resources (e.g., facilities, technologies, partnership opportunities) are useful, and d) if the curricular activities and learning environments in the program are equitable and inclusive (e.g., Maki, 2012; 2022). The deficiencies or gaps identified in the program may suggest areas (e.g., curriculum redesign, professional development, employer engagement) to direct resources within a program. Moreover, when formative assessment is mapped to each of the program learning outcomes or professional competencies in the curriculum, the aggregated assessment information across multiple courses may inform high-stakes decisions on student progress, such as whether students advance in competitive professional programs (Kulasegaram & Rangachari, 2018). Formative assessment information also prompts educators to reflect upon lower-stakes pedagogical and programmatic practices, as well as to initiate mechanisms to stay responsive to students' learning needs and in support of students' learning progress (Chen et al., 2021; Ibabe & Jauregizar, 2010; Palmer & Devitt, 2014).

Portfolios provide one of the best examples of how formative and summative assessment can be integrated, and how portfolio results can be used to inform teaching and learning at multiple levels--individual, course, and program. The assessment portfolio is not only a display of summative assessment work; it also serves as a vehicle for students to collect and respond to feedback pertaining to their learning processes, progress, and products as well as for program faculty to reflect on programmatic practices and possible improvements. Reflective student portfolios or ePortfolios, integrating self-assessment and peer-assessment, help students analyze their learning, increase knowledge retention, and build metacognitive skills over time (Bokser et al., 2016; Scartabello et al., 2018; Segaran, & Hasim, 2021). The ePortfolio allows students to display their learning artifacts and reflections from coursework spanning their entire program, with clear program rubrics/standards or intended program learning outcomes. The assessment information can lead students to make meaningful connections between their courses and proceed into higher level courses or a career path, but also can serve as a centralized resource for faculty, administrators, and institutions to identify where students' strengths and weaknesses lie. Portfolios can be used by faculty and administrators to evaluate program and general education curriculum to examine program-level learning outcome attainment and to inform curricular changes (Fitch et al, 2008; Hubert, 2016; Matthews-DeNatale, 2013).

Barriers to using formative assessment for learning improvement

An emphasis on summative assessment

The current emphasis on summative assessment is driven in part by both program and regional accreditation standards, which have increased their expectations in recent years. Key findings from a

report by Jankowski et al (2018) include that "assessment continues to be driven by both compliance and improvement." Furthermore, their survey of 811 institutions found that regional accreditation and program accreditation were cited as the two top most important factors
in driving student learning outcomes assessment. This falls in line with the expectation current accreditation bodies have regarding student learning outcomes to be assessed on a regular basis (Council for Higher Education Accreditation, 2019). While this expectation is central to effective academic program improvement, misunderstandings about the interconnectedness of summative and formative assessments may lead faculty to prioritize summative assessment. In some cases, faculty may not be cognizant of the utility and impact of formative assessment, wrongly believing that summative assessment is the only useful form of assessment. In particular, there may not be an awareness of how starting with formative assessment can more quickly identify student strengths and deficiencies and consequently, result in quick improvement efforts that can positively affect summative assessment results. Shanks (2021) shared a faculty perspective of using formative assessment efforts to improve summative assessment results in students, but this is not yet a widespread phenomenon in higher education literature. Further developing these efforts is integral for the assessment community and can be achieved by providing more information and training to faculty.

Inadequate integration of equitable & culturally responsive practice

The literature shows that the effective integration of key assessment elements (e.g., formative feedback, assessment methods and instruments) and cultural responsiveness in the formative assessment process can lead to more targeted improvements in teaching and learning (Clark, 2011). Hue and Kennedy (2015) further discussed the tenets of cultural responsiveness in assessment, such as incorporating assessment in instruction, addressing diverse learning needs of students, and removing language barriers from the assessment process. Alt and Raichel (2021) define culturally responsive assessment as formative assessment that acknowledges learners' diverse cultural variances and meets the needs of diverse student populations as they strive for academic success. Specifically, practicing formative assessment in a culturally diverse classroom may include a) addressing diverse students' learning needs by communicating expected learning outcomes and success criteria, b) using peer- and self-assessment to foster collaboration, trust, and appreciation of differences, c) providing culturally appropriate ways to facilitate learning and allow students to demonstrate learning, and d) increasing the quality of feedback to identify diverse students' learning gaps of and foster their self-regulating (e.g., Heritage & Wylie, 2018; Hodge & Cobb, 2016; Nicol, & Macfarlane-Dick, 2006). For example, Alt and Raichel (2021) explored self-assessment in a multilingual classroom at a three-month intervention program at an Israselian university. Muslim and Jewish students worked collaboratively in groups to build an educational game via a digital platform. They were provided with a rubric and asked to write a reflective diary on their development of digital skills. The findings showed that self-assessment helped students of different backgrounds to acquire digital skills and build capacity for self-regulation. To borrow Zimmerman's (2002) self-regulated model, a cycle of forethought, performance and self-reflection phases, the rubric (with clearly stated outcomes and performance standards) helped the students to plan their learning in the forethought phase and used as a guide to monitor learning during

the performance phase; the use of reflective journal encouraged students in the self-reflection phase to be reflective of their own learning processes and aware of their skills, strengths, and weaknesses (e.g., Muslim students and Jewish students had different learning needs in regard to locating and searching information). The information from student self-assessment drove teachers to adapt their teaching practices and provide targeted feedback in a personalized manner (e.g., Muslim students relied more on instructors in enhancing their skill, while Jewish students were more inclined to seek help from their peers).

With the feedback, students can correct their performance and continue their learning journey by setting new objectives, planning the next tasks, monitoring their progress, and reviewing their own practices. However, some underrepresented students may not be accustomed to using self-assessment. They may enter higher education with little experience with or fear of metacognitive reflection, concept mapping, etc. (Alt & Raichel, 2021; Rushton & Duggan, 2013). Reflective thinking is often considered to have many different levels--the 5 R's model consists of Reporting, Responding, Relating, Reasoning, and Reconstructing (Bain et al., 2002). Because students do not come to higher education with uniform experiences, instructors who intend to incorporate reflective or metacognitive formative assessments must consider the reflective experience of their students (Ryan & Ryan, 2013). By starting their students with entry-level reflection expectations including metacognitive prompts (inducing monitoring and self-regulation of one's learning processes, e.g., ''What possibilities do I have to overcome my comprehension problems?'', see detailed discussion in Berthold et al., 2007), as well as providing consistent formative feedback, instructors can support students as they increase their reflective aptitude.

A need for more faculty development

Singer-Freeman and Robinson argue, "Too often, assessment findings are not utilized to direct immediate pedagogical improvements" and "We must find ways to make changes in response to assessment findings within the space of a single class through formative assessments" (Singer-Freeman & Robinson, 2020, page 6). Lopez-Pastor & Sicilia-Camacho (2017) note that formative assessment is not widely used although variations exist between countries and universities. One barrier to more widespread use can be a lack of faculty awareness of the value of formative assessment for improving student learning and knowledge of methods for implementing it effectively; one study of STEM instructors found that instructors mostly used summative assessment methods, such as quizzes and exams, and they viewed formative assessment as an engagement strategy rather than as a way to monitor student learning. For example, while 58% of study participants said they used clicker questions during lecture as an engagement strategy, only 38% of that subset identified clickers as an assessment tool (Erdmann, et al., 2020). While engaging students in the classroom is important, formative assessment offers value beyond engagement; in order to fully utilize the value of formative assessment instructors can, for example, help students to effectively evaluate their learning progress against criteria as part of a structured process of targeted practice and learning improvement. Faculty may benefit from professional development to understand and leverage the learning value of formative

assessment to support learning improvement toward a course's intended learning outcomes as well as to enhance student skills in such areas as Self-Regulated Learning (SRL). Instructors can encounter difficulties when initially implementing formative assessment because of its differences with other assessment systems, and students also may lack experience working with this type of learning (Erdmann, et al., 2020; Lopez-Pastor & Sicilia-Camacho, 2017; van der Gulden et al., 2020; Wismath et al, 2014).

Discussion

Faculty development programs can improve teaching, student learning, and student motivation (Ambrosino & Peel, 2011; Condon et al., 2016). In order to be effective, however, faculty learning experiences need to focus on authentic practice and reflection and on inquiry rather than content (Amundsen & Wilson, 2012; Cordie & Adelino, 2020). Key elements include peer-to-peer (faculty-to-faculty) engagement, discussion, implementation in real context, and reflection. Faculty development should be recognized as an iterative process, and part of the larger goal of developing teaching as a craft; one-time immersion experiences, such as workshops, are less effective than experiences such as faculty learning communities that provide the opportunity for practice and feedback (Brown, 2016). While the literature on faculty development about teaching with formative assessment is sparse and tends to be focused at the K-12 level, we can glean that faculty development about teaching with formative assessment should mirror the goals of formative assessment itself--helping students become self-directed learners by practicing authentic tasks with targeted feedback and iteration. We agree that "true understanding and implementation of learner-centered teaching cannot be taught without direct practice and feedback on that practice, which parallels how students learn" (Ebert-May et al., 2011, p.557).

Future research should focus on expanding our understanding of faculty development aimed at developing effective formative assessment practice. We need better exploration of how to make such efforts sustainable, equitable, and connected to larger institutional priorities and planning. Carpenter (2021) calls for an increase in the role of faculty development work in larger institutional planning. How might an equitable increase in the effective use of formative assessment help support institutional goals and needs, such as attainment of learning outcomes and student retention? Other specific issues and questions that need to be addressed include workload. Does an understandable hesitancy about additional workload deter faculty and students from exploring and engaging more deeply in formative assessment? If so, how can professional development address this issue? Assessment practitioners typically argue for integrated, rather than add-on assessment--can we apply that understanding to better promote formative assessment specifically?

Based on our experiences as assessment practitioners and faculty, along with a reading of the literature, we speculate that professional development focused on formative assessment would be most effective if it were coordinated at an institutional level and accompanied by leadership explicitly articulating its value and demonstrating support for implementation through opportunities, rewards,

and recognition of the time commitment on the part of faculty. This approach seems especially important to ensure that all students have equitable access to high-quality teaching that includes effective formative assessment. Connecting this work to institution-level strategic planning would support such efforts. System-level approaches, such as ePortfolios or institution-wide professional development efforts, can effectively leverage formative assessment but they require institution-spanning commitment, coordination, and resources (Hubert, 2016).

While highly coordinated efforts might be challenging for many institutions given resource constraints or other factors, a first step might be to seek information, through a survey of faculty, about what sorts of formative assessment they are currently using, and by gathering instructors' and students' thoughts about whether and how formative assessment has been useful for learning improvement. Such information could suggest ways to leverage existing practices through institutional support, and could inform existing or new support systems for student learning over time.

Conclusion

The literature on formative assessment points to the potential value of expanding the use of formative assessment and of integrating it into larger institution-wide continuous improvement efforts to support improving student learning, especially when this is done in equitable ways that help students develop self-regulated learning skills. In addition to the faculty survey mentioned above, more research and collaboration among practitioners is needed to advance best practices for using formative assessment and to expand learning improvement for our students in ways that are better integrated with summative assessment, can be leveraged at scale, and are connected to institutional priorities. With a systemic focus, such efforts are more likely to be equitable and to improve learning for all students over time.

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