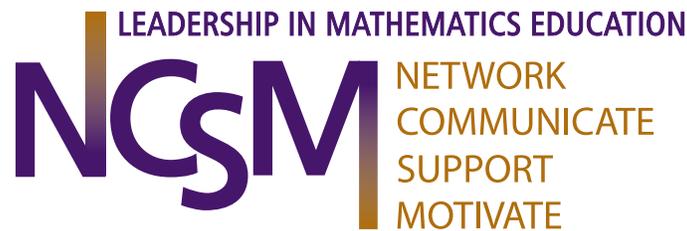


Research-Informed Answers for Mathematics Education Leaders

Improving Student Achievement By Leading Highly Effective Assessment Practices

The teaching profession is a calling, a calling with the potential to do enormous good for students. Although we haven't traditionally seen it in this light, assessment plays an indispensable role in fulfilling our calling. Used with skill, assessment can motivate the unmotivated, restore the desire to learn, and encourage students to keep learning, and it can actually create — not simply measure — increased achievement.

Stiggins, Arter, Chappuis, & Chappuis, 2006, p. 3

Our Position

It is the position of NCSM that assessment is a multifaceted process by which we gather information about students, teachers, schools, and school districts to provide formative opportunities to learn, adjust instruction and lesson planning, inform decision-making, and monitor progress and effectiveness. In order to promote and support changes in classroom practices that ensure all students are learning, teachers must balance assessment *for* learning (used to *form* instructional decisions and monitor student progress) with assessment *of* learning (used to evaluate students' progress and achievement, assign grades and appraise programs).

Of utmost importance is the *imperative* for adult *collaboration* in the development of assessments and the reflection on the results of assessment. For far too long, assessment practices have been a primary creator of inequity sorting out students due to the isolated decision-making and inconsistent learning expectations. When school

mathematics education leaders engage teacher teams in a collaborative process that establishes *what* students are to learn, *how* their learning will be assessed, and *what* the evidence of learning reveals, they promote the clarity and the consistency in purpose and implementation that is necessary to reduce bias. Consequently, leaders expand their own assessment skill set and achieve a greater chance of equity for students.

Equitable student learning experiences can only occur when teacher collaboration *trumps* the student assessment inequities created by teacher isolation, and failure to plan, teach and assess using research informed best assessment practices. "How will we know our students are learning?" must become a leadership question that is answered in the collaborative.

Thus, assessment *for* learning or *formative* assessment occurs when teams of teachers and leaders collaboratively and interdependently use classroom assessments and other information sources about student achievement. Thus, formative assessment engages teachers and leaders for dual purposes: to advance student reflection and learning and to impact future teacher lesson planning and design.

The NCSM Improving Student Achievement Series is a set of position papers designed to provide research-based practices for school and district mathematics education leaders.

Assessment of learning or *summative* assessment occurs when teams of teachers and leaders use quality classroom assessments to assign grades, use school and district achievement data to evaluate student performance over time, and ensure tight alignment between local, district and state or provincial assessment expectations.

In both cases, assessment is used to answer a critical question: “What evidence do we have that our students are learning?”

Research that Supports our Position

“Evidence from a broad concurrence of the research community, points to proven structures and practices that make an immediate difference in achievement... They [the practices] begin when a group of teachers meets regularly to identify essential and valued learning, develop common formative assessments, analyze current levels of achievement, set achievement goals, and then share and create lessons and strategies to improve upon those levels [of results].” (Schmoker, 2005)

The mathematics that is taught must be deliberately and coherently aligned with the way it is taught and how it is assessed across grade levels and courses. Classroom student assessments must have consistent levels of rigor across teachers and be used and interpreted with shared expectations throughout the school. Common assessments and scoring rubrics that are collaboratively developed within teacher teams should be used to not only to *diagnose* student progress, but to *form* student and teacher learning as an expected practice in the school culture. (Reeves, 2006)

Classroom assessments that serve as meaningful sources of information should not surprise students. Instead these assessments must be well-aligned extensions of the teacher’s instructional activities. (Gluskey, 2007). Ultimately, locally developed mathematics classroom assessments

must be aligned with provincial, state, or district standards. Students cannot be prepared for larger scale state or national assessments without the proper formative feedback, preparation and confidence necessary to perform well.

In addition, teachers’ regular use of formative assessment processes improves student achievement and learning especially when teachers use assessment results to inform and revise instructional planning and design. (National Mathematics advisory Panel, 2008, 41) Teacher teams engage in “assessment for learning” activities when they respond to the question “How can we use the assessment process to cause students to learn more, increase their achievement in the future, and impact our own instructional design and delivery?”

Formative assessment views all forms of assessment as a means and not as an end. Formative assessments include not only quizzes and tests, but also students’ solutions, questions, body language, and errors. Every summative moment gets used for a formative purpose. According to Dylan Wiliam (2007):

So the big idea of formative assessment is that evidence about student learning is used to adjust instruction to better meet student needs; in other words, teaching is adaptive to the student learning needs, and assessment is done in real time. More explicitly formative assessment is:
Students and teachers
Using evidence of learning
To adapt teaching and learning
To meet immediate learning needs
Minute by minute and day by day.

Students and teachers share the responsibility for successful implementation of formative assessment practices. Students who understand learning targets can reflect on their individual progress towards that target. Students can establish learning goals and actions that they will take in order to reach the targets. Teachers support students’ progress by using effective feedback. Bangert-Drowns, Kulik, Kulik, and

Morgan (1991) conducted a meta-analysis that concluded that only indicating to students whether or not their answers were correct had a negative effect on learning as compared to the increased achievement gained by asking students to refine their work or discover their errors.

Leading assessment experts, including Black, Marzano, Popham, Reeves, and Stiggins agree that frequent, short assessments over periods of time reveal a better picture of student's learning as compared to a mid-chapter and end of chapter test. Ehrenberg, Brewer, Gamoran, and Willms, 2001, report that the impact of assessments for learning on student achievement is four to five times greater than reducing class size. "The true value of assessment is its ability to help educators make accurate and timely inferences about student progress so that they can modify instruction accordingly." Ainsworth, (2007).

During the next decade, the primary task of the mathematics education leader will be to balance the dual purposes of assessment for accountability (e.g., grades) with accountability for learning. Research from Stiggins and Bridgford and others found that "The summative evaluation function of assessment has been too dominant and that more emphasis should be given to the potential to assist student and teacher learning" (1985). Two decades later, summative assessment as a primary purpose still prevails. It is up to the mathematics education leader to shift the emphasis on these dual purposes.

How NCSM Members can Implement our Position

As leaders, NCSM members must act to recognize the importance and impact of the skillful use of assessment on teacher practice and student learning. Highly effective collaboratively developed assessments will create greater equity through consistency in rigor as student assessments are aligned with curriculum and instructional planning.

More specifically, NCSM members must:

Engage teachers and teacher teams in collaborative discussions and actions to:

- 1) Increase the use and types of assessments *for* learning to build student confidence in themselves as learners.
- 2) Focus on the coherency in and consistency of the grading criteria and accountability used for individual and team summative assessment purposes.
- 3) Implement assessment practices and policies as a means of instructional planning and improvement. This includes but is not limited to helping teachers:
 - o become competent masters of the standards students are to master
 - o deconstruct each standard into achievement targets that help students master the standard and share the targets with students from the beginning of the learning using clearly defined terms and accessible language
 - o create high quality assessments that reflect those targets
 - o use those assessments (in collaboration with other teachers) with students to track improvement over time (Stiggins, 2007)
- 4) Use formative assessment process on data from summative assessments to improve student learning through on-going student feedback regarding criteria for success.
- 5) Translate classroom assessment results into frequent, descriptive (versus judgmental) feedback for students, providing them with specific insights regarding their strengths as well as how to improve. (PRIME, 2008)
- 6) Adjust instruction continuously based on the results of formative and summative assessments. (PRIME, 2008)

- 7) Evaluate local assessment quality and ensure the alignment with state and national curriculum recommendations.
- 8) Utilize local district benchmarks to provide formative feedback loops to the teacher team as well as to the students.
- 9) Use district, state or provincial summative data as an integral part of the total analysis of student learning and mathematics program decisions.

Ultimately, our assessment policies and practices must reflect our beliefs about the ability of all students to succeed in mathematics. Our ongoing leadership assessment actions should reflect what we most value: the use of feedback to improve teacher instruction and student learning.

For additional insight into leading through effective assessment, NCSM recommends that mathematics leaders study and apply the principles and indicators discussed in the PRIME (2008) Leadership Framework listed in the bibliography.

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National Council of Supervisors of Mathematics

Mission Statement

The National Council of Supervisors of Mathematics (NCSM) is a mathematics leadership organization for educational leaders that provides professional learning opportunities necessary to support and sustain improved student achievement.

Vision Statement

NCSM envisions a professional and diverse learning community of educational leaders that ensures every student in every classroom has access to effective mathematics teachers, relevant curricula, culturally responsive pedagogy, and current technology.

To achieve our NCSM vision, we will:

- N: Network and collaborate with stakeholders in education, business, and government communities to ensure the growth and development of mathematics education leaders
- C: Communicate to mathematics leaders current and relevant research, and provide up-to-date information on issues, trends, programs, policies, best practices and technology in mathematics education
- S: Support and sustain improved student achievement through the development of leadership skills and relationships among current and future mathematics leaders
- M: Motivate mathematics leaders to maintain a life-long commitment to provide equity and access for all learners

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