

Research-Informed Answers for Mathematics Education Leaders

Improving Student Achievement by Leading the Pursuit of a Vision for Equity

If we are to achieve a richer culture, rich in contrasting values, we must recognize the whole gamut of human potentialities and so weave a less arbitrary social fabric, one in which each diverse human gift will find a fitting place.

Margaret Mead, U.S. anthropologist (1901-1978)

Our Position

It is the position of the National Council of Supervisors of Mathematics (NCSM) that significant improvement in mathematics achievement over a sustained period requires addressing equity with the same rigor and intensity as dedicated to the improvement of curriculum, instruction, and assessment. We believe inequities caused by lack of student access to mathematical knowledge and access to the opportunity to learn this mathematics knowledge must be addressed using a systematic process. This can best be accomplished when all mathematics educators:

- respond to equity as a meaningful process to address social justice issues of race, language, gender, and class bias.
- embrace a mindset shift from a student deficit perspective of equity to a focus on creating opportunities for equal access to meaningful mathematics.
- respond to equity being less about equality and more about the need for political and social policy changes.

- recognize underachievement not as a result of group membership but more likely a symptom of varying beliefs, opportunities, and experiences to learn mathematics.

Research that Supports our Position

Often, inequalities in achievement are perceived as the result of a hierarchy of competence. When the very students who have been given more opportunities to learn show higher achievement than students provided fewer opportunities to learn, they are perceived as more capable or having more aptitude. This manner of talking about achievement gaps without mentioning opportunity gaps that cause them invites a focus on deficit models to “explain” low performance in terms of factors such as cultural differences, poverty, low levels of parental education, and so on.

Alfinio Flores, 2007

Disparities in mathematics achievement are an equity issue that is well documented with little improvement over the last decade. In order to make progress to improve student achievement, mathematics education leaders need to reframe this inequity perspective from an “achievement gap” to an “opportunity gap” (Flores, 2007). The “achievement gap” views groups of students through a deficit lens. By analyzing *opportunities and access* available to all students, educators can

focus their energies towards making the vision of equity a reality. Recent research reveals that two major sources of inequities are the lack of qualified teachers and student access to more rigorous mathematics classes.

Wilkins et al (2006) found that Latino and African American students were twice as likely to be taught by teachers with little experience, less than three years, as compared to schools with a majority of white students. Mayer, Mullens and Moore (2000) found a connection between student poverty levels and inexperienced teachers. The greater the student poverty rate the greater the percentage of inexperienced teachers in the schools.

Many students do not have access to more rigorous high school level mathematics classes due to course filtering in the eighth grade. 47% of African Americans and 49% of Latino students had taken pre-algebra or algebra in their eighth grade year. This compares to 68% of European American students (Strutchens, et al, 2004). The percentage of minority high school graduates enrolled in college bound courses in their high school curriculum falls drastically below the percentage of white students enrolled in college track courses. (Wilkins et al, 2006). This disparity is an equity issue we must address.

There are indicators that students at all grade levels experience improvement in achievement when provided mathematics programs and/or instructional and curricular methods that are aligned with NCTM's *The Principles and Standards for School Mathematics* (NCTM, 2004; www.nationsreportcard.gov). Richard Kitchen (2007a) highlights several high achieving schools serving low-income students from diverse ethnic backgrounds. Common characteristics in these schools are high expectations for students and continual academic support. These schools also provide professional learning communities for their teachers. (Kitchen, 2007b).

Marzano, Walters and McNulty (2005) verify that student performance is greatly impacted by teams of teachers working together toward common student learning goals and measuring progress as they share and discuss issues of professional practice. These teachers act as models for one another as the teachers work together in professional learning communities designed to improve adult knowledge and student learning opportunities.

Mathematics education leaders need to define effective teaching beyond content knowledge and classroom environment to one of developing and nurturing student, family and community relationships as well, by infusing cultural relevant, engaging, rigorous, yet accessible, mathematics tasks into instruction (Delpit, 1995; Haberman, 1991, 1997, Strutchens, 2000). Well-taught mathematics when contextualized in the lived experiences of the students in diverse communities increases student motivation and achievement (Lipka, 1998). By incorporating experiences of many learners, mathematics serves as a natural bridge which can be used to lead the way to greater social justice, humane equity, and validation of diverse ways people know and do. (D'Ambrosio, 2004).

NCSM leaders must encourage professional learning communities of highly engaged teachers to examine critically the social, political, and cultural causes of the achievement and opportunity gaps to determine why some students have difficulty reaching proficiency expectations. Strong professional learning opportunities can provide teachers opportunities to analyze and critique research that address these important issues and, in addition, help teachers develop mathematics lessons that engage students in rigorous, yet accessible mathematics. (Gutierrez, 2002). The goal is to improve teacher quality and create a positive impact on student achievement. (Monk, 1994; Wenglinsky, 2002).

Equity is one of four leadership principles in NCSM's *Principles and Indicators for Mathematics Educators (PRIME) Leadership Framework* (NCSM, 2008). This research-informed framework outlines actions and responsibilities that encourage focused professional conversations about equity. Leaders are challenged to acquire the necessary knowledge and leadership skills in order to help teachers eradicate biases and inequities in student-learning experiences. Therefore, NCSM leaders must become learners *before and as* they provide guidance to their constituents on this issue.

How NCSM Members can Implement our Position

As leaders, NCSM members must encourage professional learning communities of highly engaged teachers to examine critically the social, political, and cultural causes of the access and opportunity gap as one way of understanding why some students have difficulty reaching proficiency. Strong professional learning opportunities can provide teachers with chances to analyze, critique, and discuss research that address these important issues and, in addition, help teachers develop mathematics lessons that engage students in rigorous, yet accessible mathematics.

More specifically, NCSM members must:

- 1) Create a results-driven culture that examines and addresses disparities in mathematics achievement and opportunity for access among all student populations.
- 2) Examine, and address disparities in access for all populations to and within the mathematics curriculum.
- 3) Provide opportunities for teachers to collaborate with and learn from those with expertise about special education, English language learners, culturally diverse learners, students with disabilities, both

genders, and students living in poverty, so that teachers can provide additional support for students who need it, and also be able to identify and nurture talented and gifted students from all groups.

- 4) Develop and implement interventions and differentiated opportunities for students that are proactive, focused on specific individual needs, and supportive of grade-appropriate coursework.
- 5) Develop and implement relevant, challenging, and contextually appropriate curriculum and pedagogical skills that inspire, motivate, and respect culture and language.
- 6) Ensure that teachers build a climate of high expectations and deep belief in the capabilities of each student.
- 7) Eliminate policies and practices that include tracking students in the primary grades or that lock students into levels of mathematics study and that limit access to collegiate study and/or careers that use or depend on mathematics knowledge.
- 8) Develop and implement assessments *for and of* learning that will enable teachers and learners to measure and monitor progress towards proficiency by all students.

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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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