

Research-Informed Answers for Mathematics Education Leaders

Improving Student Achievement by Leading *Effective and Collaborative Teams of Mathematics Teachers*

The question for the educator/leader is not whether all humans can learn, but what conditions we can devise so they will learn. For only when the school house becomes a context for adult development will it become hospitable to student development.

*Roland Barth
Learning by Heart, 2001, p. 29*

Our Position

It is the position of NCSM that the significant improvement of mathematics teaching and learning requires the creation of structures and practices in every school and district that support and encourage meaningful professional collaboration among teachers. We believe that teacher collaboration should be viewed as a professional obligation for developing the craft knowledge of those closest to the classroom. Key elements of these collaborative teams of teachers should be reflected by a group of teachers who meet regularly as a team to collaboratively:

- Identify essential and valued student curriculum for learning.
- Share teaching strategies and analysis of the effectiveness of those strategies.
- Identify essential and valued student curriculum for learning to include, when possible and appropriate, culturally

situated contexts and connections.

- Set student achievement goals and establish specific benchmarks for student and program improvement.
- Develop common formative and summative assessments and discuss the results, at the test and item levels.
- Use data to analyze current levels of student achievement and provide intervention programs for support.
- Create lessons based on reflective discussions and observations of teacher practice.
- Adjust lesson plans based on student results and collaborative discussions with others.

The Research that Supports our Position

In many schools, mathematics teaching is regarded as an individual practice. Yet, in the past decade, there has been a consistent and growing body of research confirming the critical importance played by structured teacher collaboration and the removal of teacher isolation (Schmoker, 2005). The right kind of ongoing teacher collaboration improves the quality of teaching, significantly increases student achievement, and pays immediate dividends in the professional development of mathematics teachers and leaders.

In the words of researcher Milbrey McLaughlin,

It is not often in social science that one finds consistent patterns across time, across settings, in rural, midsize cities, urban ... All had one thing in common. Every single one of them, without exception, belong to some matter of learning community. Not one of them, not one of them, not one of these teachers across states, districts, settings, who was able to engage and sustain these kinds of classrooms, was an isolate ... Teachers were working together in collaborative and collegial teams.

Navigating the Winds of Change
NSDC 27th Annual Conference, Chicago, 1995

Deal and Peterson (1999) establish that a “better climate for the social and professional exchange of ideas and the spread of effective teaching practices” is a residue of collaborative cultures. Wood’s (1991) research verifies that teachers do not learn best in isolation. “The learning that occurs in the classroom as teachers interact with their students must be combined with opportunities for sharing these experiences with other teachers involved in the same process.”

This research provides a glimpse into the power of teacher collaboration and team building processes that can be used to “bring an entire mathematics faculty together around meaningful and shared issues about student achievement.”

According to DuFour and Eaker (2005), a primary characteristic of a professional learning is collaborative teacher teams. They state:

A basic structure of a professional learning community is a group of collaborative teacher teams that share a common purpose. Building a school’s capacity to learn is a collaborative rather than an individual task. People engaged in collaborative team learning are able to learn from one another, thus creating momentum for continuing improvement.

Fullan (1993) stresses the importance of collaborative teams in *Change Forces*. “The ability to collaborate — on both a large and small scale — is one of the core requisites of post modern society. ... In short, without collaborative skills and relationships, it is not possible to learn, or continue to learn as much as you need in order to be an agent for social

improvement.” The paradigm of teacher *collaboration* expands the knowledge base of teachers and provides opportunities for active discussions and reflections regarding student learning.

Researcher Judith Warren Little (1990) found that when teachers engage regularly in authentic “joint work” focused on explicit, common learning goals, their collaboration pays off in the form of high quality solutions to instructional problems, increased teacher confidence, and remarkable gains in student achievement.

The image of a grade-level or course-based team of mathematics teachers who meet regularly to share, reflect, and assess the impact of lessons and assessment (testing) strategies has yet to become the norm in most schools. The removal of teacher isolation in daily decision making regarding lesson plans, homework assignments, exam construction, grading practices, and effective teaching strategies is a primary factor in eliminating the inequities created by inconsistent rigor and lowered expectations for student performance by some teachers (Kanold, 2006).

How NCSM Members can Implement our Position

NCSM members must act to remove the barriers of teacher isolation, create the conditions and structures for teacher grade or course-level collaboration during the *normal work* day, and establish training for the development of crucial conversation skills among all adults. The powerful collaboration that characterizes a true teacher learning community is a systematic process in which teachers work together to analyze and improve their classroom practice, while also preserving their need for autonomy. More specifically, NCSM members must:

- 1) Establish high-performing collaborative teacher teams and *monitor* the work of those teams. They should empower teacher teams to take actions that embody the shared values of the mathematics

- program by replacing norms of isolation with norms of collaboration.
- 2) Make the purpose of the collaboration explicit; work deliberately to build trust among the mathematics teachers and provide training for the team communication skills necessary to function together successfully.
 - 3) Help each teacher team to identify student achievement gaps in the grade or course level they teach and address the inequities caused by mathematics teacher isolation, privatization, and independent decision-making.
 - 4) Radically monitor and celebrate teacher team performance, paying attention to the results in improved student achievement. Encourage discussions of work and successful initiatives to be an ongoing public endeavor.
 - 5) Collaborate with administration and other faculty to support the work and needs of the mathematics teacher teams during the contracted school day. They should provide opportunities for teacher leadership of these teams.
 - 6) Take responsibility for elevating and highlighting mathematics student achievement goals.
 - 7) Provide the current research and best practice evidence of the power of teacher teams to impact student performance.
 - 8) Help teachers learn to acquire culturally responsive pedagogical strategies and infuse, when possible and appropriate, culturally situated contexts and connections specific to the culture and communities of the students they teach and implement them in their instruction.
 - 9) Allow teachers to take responsibility to establish their own student achievement goals.
 - 10) Expect *all* teachers of mathematics to collaborate in a professional manner with integrity and honesty, using caring and respect.
 - 11) Not tolerate any form of teacher isolation and require all teachers to honor the decisions of the team as it applies to research-based best practices in mathematics curriculum, instruction, and assessment.
 - 12) Mandate that collaborative teams of mathematics teachers design *required* intervention programs targeted for struggling students *early* in the progress of each semester of the school year.

Linda Lambert (2003) indicates that teachers will willingly participate in collaborative teams if they find the effort interesting, meaningful, and rewarding to do so. As mathematics education leaders, NCSM members must then create the conditions that help teachers understand the close connection between the daily tasks at hand, the effective use of collaborative team time and the personal values of the participant teachers.

For additional insight into leading effective teams, related to adult learners, and case studies of successful implementation, NCSM recommends the books: *Leadership Capacity for Lasting School Improvement* (2003) by Linda Lambert; *Strengthening the Heartbeat: Leading and Learning Together in Schools* (2005) by Thomas Sergiovanni; and *Results Now* by Mike Schmoker (2006). These are referenced in the bibliography for this paper.

One of a series of position papers of the
National Council of Supervisors of Mathematics
www.ncsmonline.org
© 2007

Reference List

- DuFour, R., Eaker, R. and DuFour, R. (2005). *On Common Ground*. Bloomington, Indiana: National Education Service.
- Deal, T. & Peterson, K. (1999). *Shaping School Culture*. San Francisco: Jossey Bass.
- Fullan, M. (1993). *Change Forces: Probing the Depths of Educational Reform*. London: Falmer Press.
- Kanold, T. (2006). "The Flywheel Effect." *Journal for Staff Development* 27 (2), 16-21.
- Lambert, L. (2003). *Leadership Capacity for Leading School Improvement*. Alexandria, Virginia: ASCD.
- Little, J.W. (1996). *Organizing Schools for Teacher Learning*. Paper presented at the AERA Invitational Conference on Teacher Development and School Reform.
- Little, J.W. (1990). "Conditions of professional development in secondary schools." In M.W. McLaughlin, J.E. Talbert, & N. Bascia (Eds.), *The Contexts of Teaching in Secondary Schools: Teachers' Realities*. New York: Teachers College Press.
- McLaughlin, M. (1995, December). *Navigating the Winds of Change*. Keynote address presented at the 27th Annual Conference of the National Staff Development Council, Chicago.
- Schmoker, M. (2006). *Results Now*. Alexandria, Virginia: ASCD.
- Schmoker, M. "Here and Now: Improving Teaching and Learning," in DuFour, R., Eaker, R. and DuFour, R. (2005). *On Common Ground*. Bloomington, Indiana: National Education Service.
- Sergiovanni, T. (2005). *Strengthening the Heartbeat*. San Francisco: Jossey Bass.
- Wood, T. (1991). "Change in Teaching Mathematics: A Case Study." *American Educational Research Journal*, 28.

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

Revised July, 2007