

Annual Report—Executive Summary 2014-2015

Building tomorrow's citizens by inspiring excellence
in mathematics and science education today

ABOUT THE MATHEMATICS AND SCIENCE CENTERS

WHAT'S INSIDE:

**STATEWIDE
PROGRAMMING** 2

FUNDING 2

**COLLABORA-
TIONS** 3

**TEACHER/
ADMINISTRATOR** 3

**STUDENT
SERVICES** 4

**PRIORITY
SCHOOLS** 4

SPECIAL POINTS OF INTEREST:

- Completion of **3rd** year of Master Plan
- Four Accelerated HS Centers serve **61** school districts from **7** counties in Michigan
- At least **nineteen** Math/Science Centers hosted PL focusing on the Michigan Science Standards
- Over the past **three** years, Centers across Michigan facilitated Family Engineering sessions for Lower Elementary students and their parents (**11,815** participants)

The Michigan Mathematics and Science Centers Network is an organization that supports the improvement of science, technology, engineering, and mathematics (STEM) education in Michigan. Programs and services of the thirty-three Mathematics and Science Centers are made available to all Michigan public and private schools in their service areas. The following document highlights Network accomplishments in 2014-2015. A full annual report and other documents are available at www.mimathandscience.org.

The Network completed its third year of the Master Plan with two primary goals to advance STEM education in Michigan:

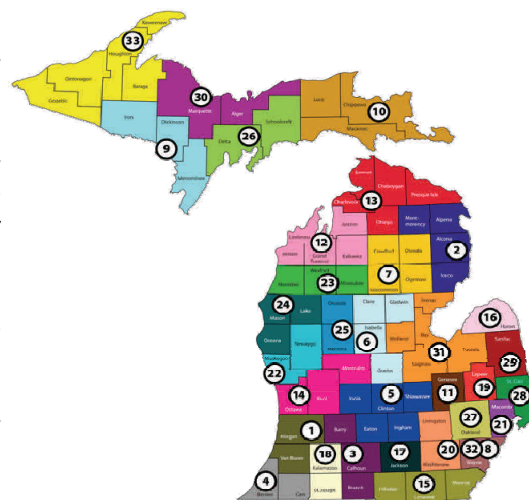
1. *Increasing the capacities of teachers to improve student career and college readiness through substantive teacher professional learning in STEM subject areas.*
2. *Continue facilitating the development of the Michigan STEM Partnership by expanding Network partnerships and collaborations among STEM-related stakeholders, including key business and industry.*

In 2014-2015, **9,153** teachers and other educators participated in **1,454** professional learning programs for a total of **147,067** hours. This represents an average of **16.1** hours per teacher participant. In addition, **78,175** students participated in **1,075** student service activities for **8,964** hours.

TWENTY-SEVEN YEARS OF SERVICE TO MICHIGAN SCHOOLS

The Mathematics and Science Centers Program was created by legislation in 1988, providing grant funds to establish Centers in cooperation with local and intermediate school districts and higher education institutions. The Network has provided programs and services to teachers, students, schools, and communities across Michigan in the 27 years since its inception. Today, every school district across Michigan has access to one of thirty-three M/S Centers.

The Network operates under a state-approved five-year Master Plan (updated and reauthorized in 2013) and a 501c(3) framework. Since its establishment, the Network has undergone significant changes, enhancing local programs and services, facilitating STEM-related statewide projects, coordinating the Michigan STEM Partnership, and administering Network and Center-level grant-funded programs.



Location of Centers in Michigan

STATEWIDE PROGRAMMING

In addition to many regular local and regional activities, the Network facilitated two multi-year statewide projects serving Michigan teachers and their students:

- **Project PRIME PLUS** (Promoting Reform in Mathematics Education)
- **TESLA** (Teachers Engaged in Science Learning and Leadership Activities)

Project PRIME PLUS built algebra content with pedagogical knowledge of middle and high school teachers to ensure that mathematics classroom instruction meets the learning needs of all students. The focus content for 2014-2015 was ratio and proportion within an instructional frame of the *Five Practices for Orchestrating Productive Mathematical Discussions* (Smith & Stein 2011). In 2014-2015, 80 organizational partners across the state served more than 346 middle and high school mathematics teachers.

TESLA, a Network multi-year professional learning initiative, began in Fall 2014 with the design and development of professional learning experiences for K-12 classroom teachers and administrators. TESLA included the implementation of NGSX (Next Generation Science Exemplar System) with almost 75 science education leaders beginning the NGSX project in September 2014. NGSX provides support for teachers in implementing modeling, argumentation and explanation with K-12 science teaching. Supporting teachers in this work, the 75 Michigan science education leaders will be prepared to facilitate the 45 hour NGSX experience. This statewide implementation will begin in 2016 with each Michigan facilitator collaboratively planning workshops in their region.



FUNDING

Base funding for M/S Centers, part of the annual State Aid Act-Section 99, totaled slightly less than \$2 million for the 2014-2015 school year. Centers have experienced reduction in their base funding for the twelfth year in a row, totaling an 80% decrease since 2002. Opportunities for schools, teachers, and students to improve science, technology, engineering, and mathematics education are severely limited. Although the Network and Centers have actively sought grants, contracts, and in-kind contributions to support programming, most Centers are holding on “by a thread.” The overall lower funding levels since 2002 have resulted in many fewer professional learning hours for teachers, fewer STEM program hours for students, decreased services to support curriculum improvement, less STEM educational resource sharing, and less time to lead STEM education improvement efforts.

Due to leveraged grant monies and a special allocation from the Legislature, professional learning programming hours have been only reduced by 33% since 2002-03 despite the 75% cut in core funding.

Unfortunately, the number of DIRECT student programming hours since 2002-03 have been reduced by 92% due to funding cuts. In collaboration with the Michigan Department of Education, the Centers decided to focus their primary efforts on providing professional learning to improve teacher knowledge, skills, and instructional practices, with the intent of improving student learning.

A return to full funding would allow the Centers and Network to more adequately address the STEM education needs of Michigan students, teachers, and schools.

COLLABORATIONS

Partnerships to advance STEM education in Michigan. Nearly 100 businesses, community groups, and government agencies partnered with MMSCN and individual Centers on a variety of projects to support STEM education for students and teachers. Examples of how students benefit from these partnerships: access to equipment and facilities, opportunities to conduct research with mentors, job-shadow people in STEM-related careers, participate in STEM competitions, and enroll in mathematics and science camps. Business and community partners include the Annis Water Resource Institute, Coleman Engineering, Eaton Corporation, Mellema Nursery LLC, Pfizer, SAS Institute Inc., United Bank, and Van Andel Education Institute.

Michigan Institutions of Higher Education and Math/Science Center Collaboration. The Network and Centers partnered with individual faculty members, college departments, and grant-funded projects in Michigan's 15 state universities, 13 private institutions, and 10 community colleges. These collaborations included developing and facilitating teacher professional learning programs; conducting college courses and seminars for teachers; creating STEM-related classroom materials; and conducting summer institutes and camps for teachers and students.

Math/Science Partnerships (MSPs). With funding from MSP grants administered by the Michigan Department of Education, Centers across the state, in partnership with Michigan higher education institutions, provided intensive mathematics and science professional learning for teachers. For example, Project PRIME PLUS worked with 346 middle and high school mathematics teachers. Hundreds of additional teachers participated in other MSPs through Centers throughout the state.

Changing the Equation Using Intel® Math: Pre/post student math test scores improved in **40** out of **45** classrooms, **20** of which were statistically significant. CEIM2 training appears to have an impact on students' understanding of particular mathematics concepts.

"I now try to let kids explore math rather than have me do the instructing all the time."
—MI²M Intel® Math teacher on how students' opportunities to learn were impacted

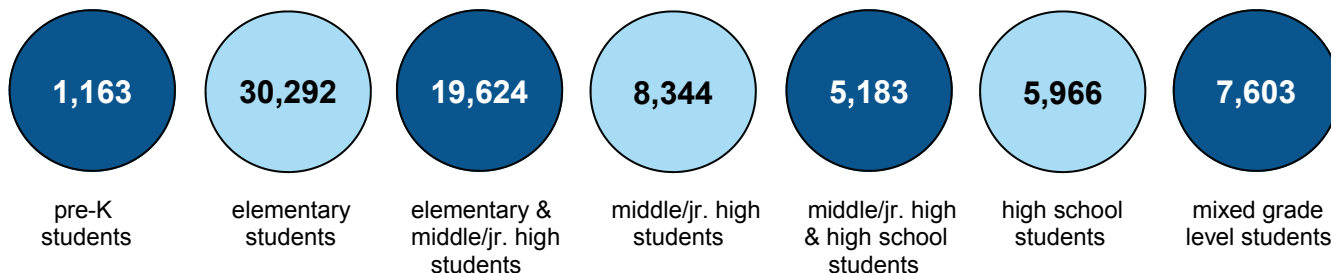


TEACHER/ADMINISTRATOR PROFESSIONAL LEARNING

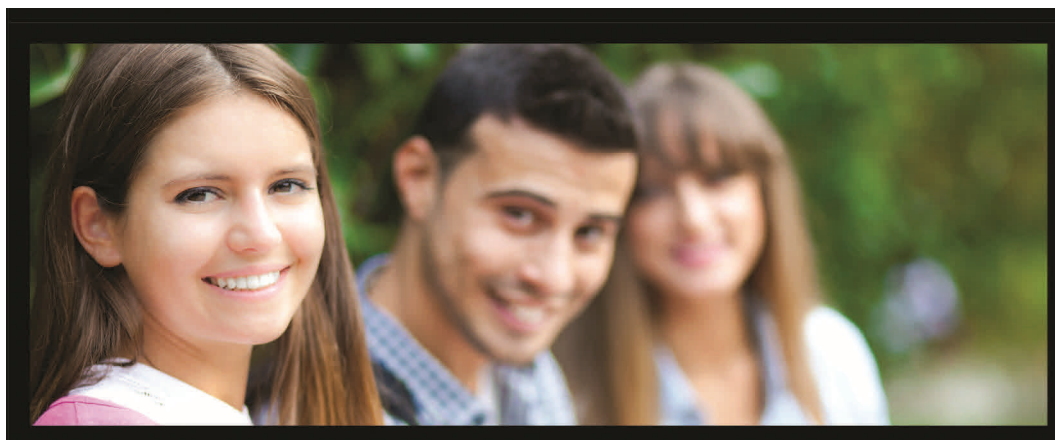
- ◆ **9,153** teachers and other educators participated in programs, including: **116** individuals teaching pre-K, **3,893** teaching elementary, **1,440** teaching middle/jr. high, **1,540** teaching high school, **821** teaching mixed grade levels, and **1,343** identified as others (administrators, paraprofessionals, etc.).
- ◆ **1,454** professional learning (PL) programs were offered: **788** in math, **526** in science, **18** in technology, **19** in engineering, and **103** in other topics.
- ◆ A total of **9,802** hours of PL were provided; **21,173** total PL enrollments.
- ◆ Over the past 16 years, **35,005** PL programs were offered; total enrollment in 16 years was **514,888** (many teachers participated multiple years in multiple programs).

STUDENT SERVICES

- ♦ **78,175** students participated directly in Center programs:



- ♦ In the past 16 years, **2,826,986** students were served directly by Centers (some students were served multiple years in more than one program).
- ♦ Centers provided innovative outreach and accelerated high school programs to meet student needs in their regions. These highly motivating math/science programs are not otherwise available.



PRIORITY SCHOOLS

SAMPI—SCIENCE AND MATHEMATICS PROGRAM IMPROVEMENT

Mallinson Institute for Science Education
College of Arts and Science
Western Michigan University
SAMPI—MS 5442
1903 W. Michigan Ave
Kalamazoo MI 49008
Phone: 269-387-2417
E-mail: kristin.everett@wmich.edu

Centers targeted Priority Schools and provided intensive building-wide professional learning, including: classroom level and small group professional learning, classroom observations to identify needs, modeling math and science lessons, content integration advice, assessment assistance, achievement gap analysis, and resource acquisition. Teachers in **37 out of 128 (29%)** 2014-15 Priority Schools attended **137** different professional learning programs from Centers, which represents **1,130** activity hours and a total of **2,444** contact hours.

The 2014-2015 Executive Summary was prepared by Science and Mathematics Program Improvement (SAMPI), Western Michigan University. Questions about this report should be directed to Dr. Kristin Everett, (kristin.everett@wmich.edu). To learn more about the MMSCN, visit the website, www.mimathandscience.org or contact Kathy Surd, President (ksurd@wsesd.org or 231-843-5959) or Mary Starr, Executive Director (mary@starrscience.com or 734-612-8780).