

New Directions



Maine Mathematics and Science Alliance

1997-98 *Annual Report*

New Directions

STANDARDS-BASED EDUCATION IMPROVES PERFORMANCE:

From Awareness to Adoption

The Maine Mathematics and Science Alliance (MMSA) is a private, non-profit organization dedicated to improving student performance in science and mathematics so that all students will meet or exceed state and national standards by 2002. The Maine Mathematics and Science Alliance is focusing its efforts on implementing our state's *Learning Results* in mathematics and science. We recognize that Maine teachers, policy makers, and community members are ready to move from awareness of standards to their implementation in the classroom. The Maine Mathematics and Science Alliance is working to accomplish this through:

- **School-based reform** initiatives with K-12 school systems called Cooperating Schools;
- **Statewide, regional, and school-level teacher leaders** conducting professional development in science and mathematics;
- **Community engagement** to increase understanding and broaden public participation in mathematics and science reform issues;
- **Policy influence and implementation** to support the precepts of the Maine Mathematics and Science Alliance.

These current strategies target the school as the agent of change. Each school now working with the Maine Mathematics and Science Alliance has committed substantial time and administrative support to sustaining on-going professional development for teams of teachers.



Maine Mathematics

A BLUEPRINT FOR PROFESSIONAL DEVELOPMENT

The Most Important Ingredient for Student Success

The Maine Mathematics and Science Alliance's primary strategy is to improve the educational achievement of Maine students in science and mathematics by providing high-quality professional development for their teachers. (Maine students' test scores leading all other states in science and mathematics suggest that the strategy of enhancing professional development is working.) This approach has provided valuable lessons about the necessary elements to ensure effective Professional Development.

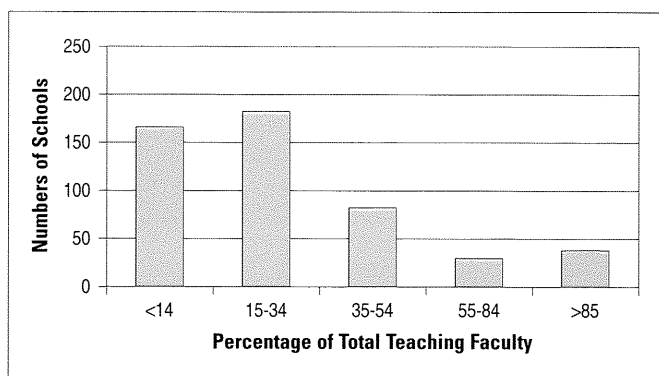
The Maine Mathematics and Science Alliance's Policy Committee, as well as many other Maine stakeholders, helped to develop a document to provide a blueprint for policy makers, educators, and community members for implementing Maine's *Learning Results* through professional development. The core ideas of this document are:

- 1. Time** time to collaborate and to study content, pedagogy, and assessment
- 2. Practice** incorporate new learning through action, reflection, and sharing
- 3. Networking** maintaining contact with other learners, in person or electronically
- 4. Content** increasing subject knowledge and how to teach content better
- 5. Leadership** all participants have leadership roles, both top-down to bottom-up
- 6. Persistence** continuous, on-going opportunities to learn and practice
- 7. Local roots** building on local needs and local talent

- 8. Strategic** part of a long-range plan for the system and individual teachers
- 9. Varied** workshops, institutes, internships, retreats, and other opportunities
- 10. Resources** increase funding for professional development to 5% of salaries

A recent national study showed a stunning 70% correlation between teacher preparation and professional development and student performance. That was the single most important ingredient for student success, ranking higher than class size and teachers' degrees.

Maine schools are committing more time for professional development in mathematics and science. Over the last four years, 65% of Maine schools have provided 15 hours or more and have involved a larger proportion of their staff in professional development for mathematics and science education. The chart below shows the levels of staff participation of 491 schools in MMSA¹ sponsored professional development of 15 hours or longer in duration.



¹ Data is from 1993-1997 academic years and does not include local school district Title II professional development activities.

Changing Direction

1997-98: A YEAR OF CHANGE FOR THE MAINE MATHEMATICS ALLIANCE

Since 1992, MMSA has been working to improve science and mathematics education for all Maine students.

1992-1997

BUILDING PARTNERSHIPS

The Maine Mathematics and Science Alliance was successful in helping to coordinate the efforts of existing and emerging groups interested in improving education.

1997-1998 into the Future

EXPANDING THE ROLE OF COMMUNITY PARTNERS

The Maine Mathematics and Science Alliance continues its efforts to serve parents around the state, and has recently submitted a major grant proposal to guide parents in supporting their children's science and mathematics education. The Maine Mathematics and Science Alliance has also linked with non-traditional educators such as environmental organizations to offer standards-based resources for educators and parents.

The Maine Mathematics and Science Alliance focuses its communications with educators and other members of the cyber-community through Maine LabNet, a web-based discussion group, science and mathematics listservs, and Maine Mathematics and Science Alliance's web page. The web-based discussion groups allow teachers to participate in thoughtful dialogue about programs and issues in mathematics and science education or simply seek a classroom activity for the next day's lesson.

1992-1997

TEACHERS AS PARTICIPANTS

In its first five years, the Maine Mathematics and Science Alliance staff and consultants provided intensive professional development opportunities (longer than 15 hours) for 4,646 teachers. Many of these participants went on to become Teacher Leaders in their own systems and at the state level.

1997-1998 into the Future

TEACHERS AS LEADERS

Teachers teaching teachers is a powerful model for professional development. The Maine Mathematics and Science Alliance is developing a cadre of 150 teachers who work in various arenas providing instruction, curriculum, and program support to the many schools engaged in professional development with the Maine Mathematics and Science Alliance. Teacher Leaders work with school systems on an extended basis, providing personal support through professional development and class visits. Teacher Leaders also continuously share strategies and resources through internet listservs and moderated electronic discussion groups maintained by the Maine Mathematics and Science Alliance.

1992-1997

BEACON CENTERS

Seven Beacon Centers had resident science and mathematics specialists who provided professional development for school districts and the region and modeled best practices for area teachers.

1997-1998 into the Future

SCHOOL-BASED PARTNERSHIPS

The Maine Mathematics and Science Alliance is now working with 72 schools providing technical assistance through a network of staff and trained Teacher Leaders. This is a new type of one-on-one partnership between school systems and the Maine Mathematics and Science Alliance. Each school and school district agrees to devote time and resources while the Maine Mathematics and Science Alliance provides personnel support in implementing exemplary curriculum, instructional practices, and assessment. Equity, need, and commitment are the criteria for selecting the schools who participate.

Maine Mathematics

and Moving Ahead

SCIENCE ALLIANCE

activities from its first five years informed its strategic priorities for 1997 and beyond.

1992-1997

IMPLEMENTING HIGHER EDUCATION

The Maine Mathematics and Science Alliance began working with higher education through the Science and Mathematics Academies and a program called the Beacon College.

1998 into the Future

FORGING K-16 PARTNERSHIPS

The Maine Mathematics and Science Alliance is forging new relationships with Maine's universities and school systems. University System faculty and their students at six campuses work in collaboration with classroom teachers, examining practices and content areas that the teachers have identified to improve the K-12 learning experience. As a result of this real-world experience, university faculty are also making changes in the way they prepare their pre-service teachers.

1992-1997

PASSING LEARNING RESULTS

The Maine Mathematics and Science Alliance created the document, *Maine's Curriculum Framework for Mathematics and Science*, which became the model for the Mathematics and Science and Technology standards in Maine's *Learning Results*. The Maine Mathematics and Science Alliance worked closely with educational and community groups, such as the Department of Education and the Maine PTA, to help win passage of these standards by the Maine legislature.

1997-1998 into the Future

IMPLEMENTING LEARNING RESULTS

The Maine Mathematics and Science Alliance works at the school level and at the state level to help create workable programs and assessment tools that honor diversity and creativity while raising student achievement. The Maine Assessment Project is working with 500 mathematics and science teachers from 120 schools to develop new assessment strategies using portfolios, scoring guides, and rubrics.

The Maine Mathematics and Science Alliance continues to influence educational policy at the state level. It provides guidance for state education leaders by producing written guidelines for assessment and professional development for implementing *Learning Results*.

1992-1997

DEMONSTRATING BEST PRACTICES

In the early years of the Maine Mathematics and Science Alliance the emphasis was on introducing the concepts of hands-on, inquiry learning to the education community.

1997-1998 into the Future

IMPLEMENTING CURRICULUM

Now that teachers have accepted the mathematics and science standards of the *Learning Results* and *Maine's Curriculum Framework for Mathematics and Science*, professional development focuses on teachers using exemplary curricula such as the *Connected Mathematics Project*, *Investigations*, and *Conceptual Physics Units*.



and Science Alliance

MMSA Timeline

ACCOMPLISHMENTS

The Maine Mathematics and Science Alliance launched many new initiatives to begin to implement standards-based mathematics and science education.

1997

JULY

- Seven Science and Mathematics Academies convened

AUGUST

- MMSA staff roles restructured, with reassignments and new hires

SEPTEMBER

- Six new Cooperating School Partnerships began
- MMSA reviewed all programs to match new strategies
- Lessons learned in first 5 years shaped new agenda
- Maine LabNet Pilot launched

OCTOBER

- K-16 Partnership program formed
- Data system revised
- Maine Assessment Project initiated
- Teacher Leader training program launched
- Two-year Title I partnerships established with 44 low-performing schools (based on MEA results)

NOVEMBER

- 1998-99 Academy Request for Proposals released
- MMSA aligned programs with data from 1992-97

DECEMBER

- 300 teachers attended Teacher Leader PRISM conference
- Professional development conference held for Title I schools
- New MMSA Advisory Board met

1998

JANUARY

- Maine LabNet pilot completed and evaluated
- Maine LabNet opened to 400 teachers
- New MMSA Standing Committees began meeting

FEBRUARY

- 150 teachers convened for Teacher Leader training

MARCH

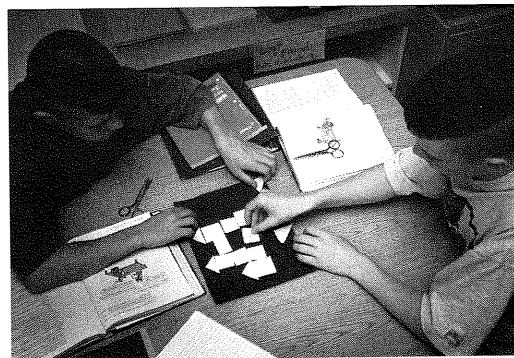
- 4 proposals awarded funding for 1998-99 Academies
- K-16 Partnerships awarded to 6 University sites and 12 schools

APRIL

- 15 Teacher Leader groups established

MAY

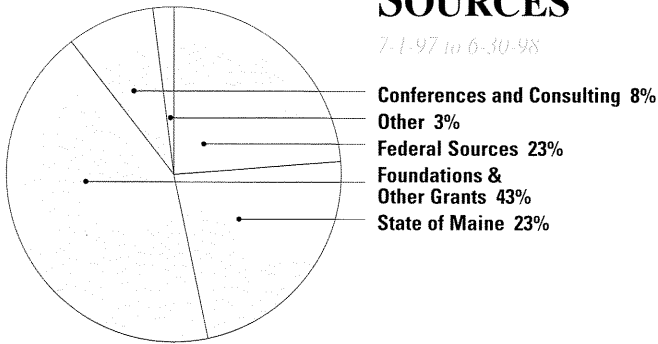
- 13 additional Cooperating School contracts awarded
- 18 professional development opportunities, lasting a week or longer, offered by MMSA
- Teacher Leader conference held
- Cooperating Schools conference held



Maine Mathematics

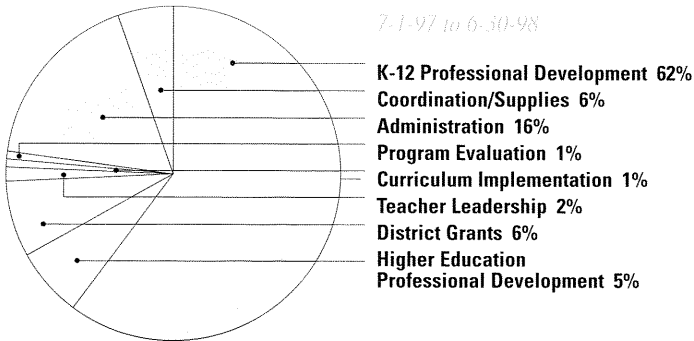
FUNDING SOURCES

7-1-97 to 6-30-98



DISTRIBUTION OF FUNDS

7-1-97 to 6-30-98



In addition to primary funding from the Libra Foundation, Maine Mathematics and Science Alliance received grants from the National Science Foundation, the Maine Department of Education, the U.S. Department of Education, Michigan State University, San Diego State University Foundation, NASA, the Aerospace States Association (ASA), the Regional Alliance for Mathematics and Science, and UNUM Foundation.

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