

Title II Part B: Mathematics and Science Partnerships (MSP) Program

Program Overview

The Mathematics and Science Partnership (MSP) projects (authorized in ESEA: Title II, Part B [Section 2201-2203]) are intended to enhance the capacity of local teachers to enact curricula reforms that produce higher student achievement in mathematics and science. A partnership between local school districts and institutions of higher education's science, technology, engineering, and mathematics faculty is the conduit used to reach these goals and is required in these projects.

A key component of the No Child Left Behind legislation focuses on highly qualified teachers. Numerous large-scale studies have identified teacher quality, more than other factors, as a key determinant of student success. Studies have consistently documented the important connection between a teacher's verbal ability and content knowledge with student achievement. Congress made it clear that it considers content knowledge to be of paramount importance. Current state certification systems and teacher preparation programs may not be doing enough to ensure preparation in solid content knowledge.

Congress has provided resources to improve capabilities and content knowledge of teachers. The law requires 100% of teachers in Title I schools be highly qualified by 2005. Additional funds were allocated in Title II, Part B, to support initiatives of Mathematics and Science Partnerships (MSP).

Research suggests that in order to have a positive and lasting impact on classroom instruction and student learning, professional development should be sustained, intensive, and classroom-focused. The U.S. Department of Education is committed to assisting partnerships to provide high quality professional development in the support of teachers' efforts to raise student achievement. Long-term plans that include multi-week institutes coupled with support over a sustained period are critical. A promising model for this would be the establishment and operation of summer workshops or institutes (see definition on p. 2) with follow-up training to support classroom implementation. Distance learning programs using curricula that are innovative, content-based, and based on scientifically based research that is current can address problems in rural areas. Ongoing opportunities for enhanced professional development of mathematics and science teachers that improves the subject matter knowledge and promotes strong teaching skills is a necessity.

The design of professional development will center on content knowledge, the principles of effective instruction and student learning, a commitment of time and resources for implementing development over an extended period of time, and the employment of professional development styles that engage teachers collaboratively rather than focusing on them as individuals.

Program Goals

- To provide activities that are supported by scientifically based research and designed to deepen mathematics and science teachers' content knowledge and knowledge of how students learn particular content;
- To improve the quality and coherence of the learning experiences for teachers through high-quality professional development;
- To link teachers' opportunity to learn with opportunity to implement classroom instruction;
- To promote sustainable relationships between institutions of higher education and K-12 schools that strengthen reform efforts in K-12 education.
- To focus on the education of mathematics and science teachers as a process that continuously stimulates teachers' intellectual growth and upgrades teachers' knowledge and skills;
- To bring mathematics and science teachers in schools together with scientists, mathematicians, and engineers to increase the subject matter knowledge of those teachers and improve such teachers' teaching skills through the use of sophisticated tools and work space, computing facilities, libraries,

and other resources that institutions of higher education are better able to provide than the K-12 schools.

Authorized Activities

1. Creating opportunities for enhanced and ongoing professional development of mathematics and science teachers that improves the subject matter knowledge of such teachers.
2. Promoting strong teaching skills for mathematics and science teachers and teacher educators, including integrating reliable scientifically based research teaching methods and technology-based teaching methods into the curriculum.
3. Establishing and operating mathematics and science summer workshops or institutes, including follow-up training, for elementary school and secondary school mathematics and science teachers that —
 - a. Shall —
 - ❖ directly relate to the curriculum and academic areas in which the teacher provides instruction, and focus only secondarily on pedagogy;
 - ❖ enhance the ability of the teacher to understand and use the challenging State academic content standards for mathematics and science and to select appropriate curricula; and
 - ❖ train teachers to use curricula that are —
 - based on scientific research;
 - aligned with challenging State academic content standards; and
 - object-centered, experiment-oriented, and concept- and content-based; and
 - b. may include —
 - ❖ programs that provide teachers and prospective teachers with opportunities to work under the guidance of experienced teachers and college faculty;
 - ❖ instruction in the use of data and assessments to inform and instruct classroom practice; and
 - ❖ professional development activities, including supplemental and follow-up activities, such as curriculum alignment, distance learning, and activities that train teachers to utilize technology in the classroom.
4. Recruiting mathematics, engineering, and science majors to teaching through the use of —
 - a. signing and performance incentives that are linked to activities proven effective in retaining teachers, for individuals with demonstrated professional experience in mathematics, engineering, or science;
 - b. stipends provided to mathematics and science teachers for certification through alternative routes;
 - c. scholarships for teachers to pursue advanced course work in mathematics, engineering, or science; and
 - d. other programs determined to be effective in recruiting and retaining individuals with strong mathematics, engineering, or science backgrounds.
5. Developing or redesigning more rigorous mathematics and science curricula that are aligned with challenging State and local academic content standards and with the standards expected for postsecondary study in mathematics and science.
6. Establishing distance learning programs for mathematics and science teachers using curricula that are innovative, content-based, and based on scientifically based research.
7. Designing programs to prepare a mathematics or science teacher at a school to provide professional development to other mathematics or science teachers at the school and to assist beginning and other teachers at the school, including (if applicable) a mechanism to integrate the teacher's experiences from a summer workshop or institute into the provision of professional development and assistance.
8. Establishing and operating programs to bring mathematics and science teachers into contact with working scientists, mathematicians, and engineers, to expand such teachers' subject matter knowledge of and research in science and mathematics.
9. Designing programs to identify and develop exemplary mathematics and science teachers in the kindergarten through grade 8 classrooms.

10. Training mathematics and science teachers and developing programs to encourage young women and other underrepresented individuals in mathematics and science careers (including engineering and technology) to pursue postsecondary degrees in majors leading to such careers.

Eligibility Requirements

To be eligible for a subgrant, a “partnership” must include an engineering, mathematics, or science department of an institution of higher education (including two-year and four-year accredited colleges and universities) and a high-need local educational agency (LEA). In addition to these two required partners, the partnership may also include: another engineering, mathematics, science, or teacher training department of an institution of higher education; additional LEAs, public or private elementary schools or secondary schools, or a consortium of such schools; a business; or a nonprofit or for-profit organization of demonstrated effectiveness in improving the quality of mathematics and science teachers [Section 2201(b)]. These requirements are designed to ensure that Mathematics and Science Partnerships emphasize the improvement of content knowledge of teachers in mathematics and science through an expanded role of the disciplinary departments in higher education institutions.