



Key Issue:

**Recruiting Mathematics and Science Teachers
at the Elementary and Middle School Levels**

2006



1120 East Diehl Road, Suite 200
Naperville, IL 60563-1486
800-356-2735 • 630-649-6500
www.learningpt.org

Copyright © 2006 Learning Point Associates, sponsored under government cooperative agreement number S283B050051. All rights reserved.

This work was originally produced in whole or in part by the National Comprehensive Center for Teacher Quality with funds from the U.S. Department of Education under cooperative agreement number S283B050051. The content does not necessarily reflect the position or policy of the Department of Education, nor does mention or visual representation of trade names, commercial products, or organizations imply endorsement by the federal government.

The National Comprehensive Center for Teacher Quality is a collaborative effort of Education Commission of the States, ETS, Learning Point Associates, and Vanderbilt University. 1399_07/06

Contents

	Page
Scenario: Seeking Skilled Mathematics and Science Teachers at the Elementary and Middle School Levels	1
Benefits	2
Tips	4
Strategy 1: Form Partnerships With Institutions of Higher Education	5
Strategy 2: Grow Your Own	8
Strategy 3: Create High-Quality Alternative Routes to Certification	10
Strategy 4: Streamline the Hiring Process	12
Strategy 5: Offer Financial Incentives	13
Strategy 6: Support New Teachers in the Classroom	16
Real-Life Example: Colorado Partnership Supports Middle-Level Mathematics and Science Teachers	20
References	21

Scenario: Seeking Skilled Mathematics and Science Teachers at the Elementary and Middle School Levels

Susan has been teaching in her rural school district for 14 years. She currently teaches fifth grade. She is known for her leadership skills and has worked hard to improve professional development for teachers in her school district. Susan has participated in state and national professional development conferences and also has worked closely with the leading national professional development organization.

Providing high-quality, job-embedded professional development to all teachers in her state is her highest priority. Since she is an elementary teacher, her primary focus has been on professional development for elementary teachers.

Over the past several years, her school district has struggled to recruit and retain middle school teachers, especially in traditionally hard-to-staff subjects like mathematics and science. Her state does not offer middle-level licensure, so middle school teaching positions have traditionally been filled by teachers trained to teach elementary or high school. Unfortunately, the state has done little to recruit teachers at the middle level; also, teacher preparation programs do not offer specialization for middle-level grades, since there is no licensure option.

Because of Susan's leadership skills and expertise in professional development, she has been asked to sit on a statewide task force to investigate concerns and make recommendations regarding the middle school teacher shortage. During her term, she learns of the severe shortage of middle school teachers, especially in urban and rural schools. She also learns that most of her state's middle school teachers have no mastery of the subjects that they teach, and the problem is even worse for mathematics and science teachers.

Susan feels strongly that high-quality professional development is essential to creating and supporting high-quality teachers, so she knows that the task force must recommend strengthening professional development for middle school teachers, especially in mathematics and science. But what other policies should the task force make to recruit middle-level teachers? What should policymakers do specifically to lure mathematics and science professionals to teach these adolescent students?

Benefits

Strong recruitment strategies for elementary and middle school mathematics and science teachers help schools and districts reach the following goals:

- **Meet requirements for highly qualified teachers in elementary and middle schools under the federal No Child Left Behind Act.** Under the federal No Child Left Behind Act (NCLB), elementary and middle school teachers must prove subject-matter knowledge. While most elementary school teachers have majors in elementary education, there is some discrepancy as to whether they must also prove knowledge of mathematics, science, and reading under the law. At the middle school level, the law is clear that teachers must indeed demonstrate mastery of the subject they teach.

Many school districts already struggle to recruit middle school teachers. In its 2002 policy statement concerning middle grades, the National Forum to Accelerate Middle-Grade Reform reports that only 20 percent of middle-level teachers are trained in the area they teach. The problem is even worse in rural and urban areas.

There is little doubt that challenges lie ahead. According to the National Science Foundation (2006), between 23 percent and 29 percent of public middle-grade and high school mathematics and science teachers did not have a college major or minor in their teaching field in the 1999 academic year. Recruiting New Teachers (Fideler, Foster, & Schwartz, 2000) reports that of the largest urban school districts, nearly 98 percent of responding districts noted an immediate demand for science teachers and 95 percent reported an immediate demand for mathematics teachers. The National Commission on Mathematics and Science Teaching for the 21st Century (2000) reports that America's classrooms need 240,000 mathematics and science teachers during the next decade.

Developing a strong recruitment strategy would assist schools and districts in ensuring a pool of qualified candidates for elementary and middle school mathematics and science teaching positions.

- **Compete for candidates with a major in mathematics and science.** All mathematics and science teaching positions are typically difficult to staff because students majoring in these subjects have other career options offering more opportunities and higher salaries. Recruiters face additional challenges recruiting these candidates to elementary and middle schools because of the age of the children and simplicity of the curriculum. A 2003 report by Anthony Milanowski indicates that students with an interest in mathematics and science would be more likely to pursue teaching if they received a competitive salary and felt that their skills were matched for the position. Milanowski argues that schools and districts should market the positions in a way that appeals to the interests of mathematics and science majors and that they should offer salaries high enough to effectively attract these candidates.

Recruitment strategies—such as grow-your-own, financial incentives, and alternative licensure—can help elementary and middle schools to be competitive in this job market

and to lure students who are interested in teaching elementary and middle school children.

- **Design a systematic recruitment effort that meets the needs of the district or school, and thereby strengthen the candidate pool for mathematics and science teachers.**

Schools and districts spend an inordinate amount of time randomly searching for teachers, especially in shortage areas such as mathematics and science. In 2003, the New Teacher Project (Levin & Quinn, 2003) released its study of hiring practices in urban school districts desperately in need of teachers in shortage areas. Research reveals that many districts and schools are wrapped up in red tape and bureaucracy to the extent that even if good candidates for shortage areas apply for teaching positions, the districts and schools often fail to hire them.

A systematic recruitment effort that is designed to meet the needs of a particular elementary or middle school not only attracts the right candidates but also streamlines the process so that the candidates applying for the positions are most likely a good fit for the job.

Tips

When recruiting mathematics and science teachers for elementary and middle schools, remember to do the following:

- Implement strategies that provide meaningful incentives for prospective teachers.
- Specifically target those teachers with the experience and education to meet the needs of your school.
- Build a relationship and craft a strategy with input from local institutions of higher education.
- View the strategies as part of a larger effort to recruit and retain high-quality teachers for every subject at every grade level.
- Take advantage of the local supply of potential teachers.
- Use the Internet to increase the reach of recruitment efforts.
- Provide high-quality opportunities for people in other professions to transfer into teaching.
- Selectively accept candidates from alternative preparation programs.
- Make an effort to broaden the pool of prospective teachers to promote diversity.

Strategy 1: Form Partnerships With Institutions of Higher Education

Collaborating with universities is beneficial for schools and districts on many fronts. Districts can work with universities to produce more mathematics and science teachers who will be trained to teach elementary and middle school students. Many alternative routes to certification are based at local universities and allow paraprofessionals, military personnel, and other professionals with a background in mathematics and science to transition into teaching. Through strong partnerships, districts can help evaluate the quality of university graduates and have a voice in reforming teacher preparation programs.

Resource 1: *Breaking Ranks in the Middle*

National Association of Secondary School Principals & The Education Alliance at Brown University. (2006). *Breaking ranks in the middle: Strategies for leading middle level reform*. Reston, VA: National Association of Secondary School Principals.

This report addresses what policymakers and school leaders can do to effectively implement reform at the middle school level. It argues that schools should build partnerships with institutions of higher education to provide teachers and administrators at both levels with ideas and opportunities to enhance the training, performance, and evaluation of educators.

Resource 2: *Success in the Middle*

National Middle School Association. (2006). *Success in the middle: A policymaker's guide to achieving quality middle level education*. Westerville, OH: Author. Retrieved July 17, 2006, from http://www.nmsa.org/portals/0/pdf/advocacy/policy_guide/NMSA_Policy_Guide.pdf

This report establishes goals and recommends specific policies for federal, state, and local policymakers to better support middle school students, teachers, and leaders. It promotes collaboration with colleges and universities to align administrator preparation programs with research-based leadership and instructional practices that have been shown to increase the academic performance and healthy development of young adolescents.

Resource 3: *Mathematics and Science Partnership of Southern New Jersey*

Rowan University's Mathematics, Computer, and Science Instructional Improvement Programs Website: <http://www.rowan.edu/open/mcsiip/msspgrant.htm>

“Rowan University has been awarded \$2.5 million to work with four southern New Jersey school districts in reforming mathematics and science instruction. As a partner in a \$12.3 million grant to Rutgers University from the National Science Foundation, Rowan will also collaborate with Kean University and eight other NJ districts. [The project] will be used to unite the activities of higher education institutions, pre-kindergarten through high school systems and other partners to support better teacher development in math and science, and raise student achievement.”

Resource 4: Marian College and Greater Indianapolis Chamber of Commerce Partnership

Marian College. (n.d.). *Marian College joins “Education Plus” program* [News brief]. Retrieved July 17, 2006, from http://www.marian.edu/aboutmarian_newsbriefs.asp?ID=186

In May 2006, Marian College and the Greater Indianapolis Chamber of Commerce announced a partnership that would provide annual scholarships for science, science education, mathematics, or mathematics education to students of employees of companies or not-for-profit organizations who are members of the chamber of commerce.

Resource 5: The Partnership for Teacher Excellence in New York City

New York City Department of Education. (2006). *Mayor Bloomberg announces new partnership for teacher education* [Press release]. Retrieved July 17, 2006, from http://www.nycenet.edu/News/2005-2006/News_01_27_06.htm

Beginning in 2006, the City University of New York, New York University (including the Steinhardt School of Education and the Faculty of Arts and Sciences) and the New York City Department of Education will begin the Partnership for Teacher Excellence to develop and implement an innovative new model for teacher education to address the city’s need for highly qualified, well-trained teachers in high-need areas, such as mathematics and science.

Resource 6: Teacher Quality Enhancement Grants

U.S. Department of Education’s Teacher Quality Enhancement Grants
Website: <http://www.ed.gov/programs/heatqp/index.html>

This website provides information about resources and funding available to state and local education agencies and teacher preparation institutions to help them better prepare and recruit new teachers.

Resource 7: Illinois Board of Higher Education’s Teacher Quality Enhancement Grant

Illinois Board of Higher Education’s Teacher Quality Enhancement Middle School Initiative
Website: <http://www.ibhe.state.il.us/TQE/ProjectAtAGlance.htm>

“The Illinois State Teacher Quality Enhancement (TQE) grant entitled ‘A Common Vision: Teacher Quality Enhancement in the Middle Grades in Illinois,’ is a collaboration of the three principal educational agencies in Illinois—the Illinois Board of Higher Education (IBHE), the Illinois State Board of Education (ISBE), and the Illinois Community College Board (ICCB). The Illinois Board of Higher Education serves as the lead agency. The Illinois State TQE grant has the following objectives:

- “Improving state licensure and certification requirements for middle-grade teachers;
- “Redesigning teacher preparation curriculum for middle-grade teachers;
- “Developing a seamless teacher preparation route between two- and four-year institutions

- “Creating Web-accessible courses for delivery of teacher preparation courses;
- “Developing innovative strategies to recruit highly competent middle-grade teachers for high-poverty urban and rural areas; and
- “Creating clinical experiences at middle-grade schools for higher education Arts and Science and Education faculty.”

Resource 8: *Ahead of the Class*

Clewell, B., & Villegas, A. (2001). *Ahead of the class: A handbook for preparing new teachers from new sources*. Washington, DC: The Urban Institute. Retrieved July 17, 2006, from http://www.urban.org/UploadedPDF/ahead_of_the_class.pdf

Section 1 of this handbook describes the steps necessary to create a successful institutional partnership.

Resource 9: Benedum Collaborative

Benedum Collaborative

Website: <http://www.hre.wvu.edu/benedum/>

The Benedum Collaborative is an example of a collaborative effort between 28 public schools, five school districts, West Virginia University’s College of Human Resources and Education, and the Eberly College of Arts and Science. The collaborative has redesigned West Virginia University’s Teacher Education Program and established Professional Development Schools. Public school teachers collaborate continuously with university faculty to provide learning experiences for teacher education students.

Strategy 2: Grow Your Own

Schools and districts need to encourage members of the community to become mathematics and science teachers in elementary and middle schools—and to support their efforts. Recruitment should begin early: in middle school classrooms and through extracurricular activities that encourage students who excel in mathematics and science to pursue a career in teaching. By the time students reach high school, formal recruitment programs should be in place, providing encouragement, mentoring, training, and financial assistance toward certification.

In addition to recruiting students to be future mathematics and science teachers, schools and districts can promote a teaching career to parents, community members, and other mathematics and science professionals. With encouragement, support and high-quality alternative certification routes, members of the community can become effective, certified teachers.

Resource 10: Illinois “Grow Your Own” Teacher Program

Illinois “Grow Your Own” Teacher Education Initiative

Website: <http://www.isbe.state.il.us/rules/archive/pdfs/60ARK.pdf>

In 2004, the Illinois Legislature enacted the “Grow Your Own” program to prepare highly skilled teachers for hard-to-staff subjects, such as mathematics and science, in hard-to-staff schools. The goal is to recruit 1,000 teachers by 2016 and retain them for seven years.

Resource 11: Prezell R. Robinson Scholars Program in North Carolina

Prezell R. Robinson Scholars Program

Website: <http://www.dpi.state.nc.us/scholarships/robinson.html>

“The Prezell R. Robinson Scholars Program (formerly the Challenge Scholars Program) is designed to encourage high school students to pursue careers in teaching. Low-wealth school systems and school systems with documented difficulty in recruiting qualified teachers are eligible to participate. Robinson Scholars participate in system-sponsored activities designed to foster their commitment to teaching and enhance the likelihood they will be accepted to and complete an approved teacher education program. Upon graduation from high school, Robinson Scholars who meet prescribed SAT and grade point average requirements are awarded a Prospective Teacher Scholarship Loan (PTSL) to pursue a program of study leading to teacher licensure in North Carolina.”

Resource 12: *Urban Teacher Academy Project Toolkit*

Berrigan, A., & Schwartz, S. (2000). *Urban teacher academy project toolkit: A guide to developing high school teaching career academies*. Belmont, MA: Recruiting New Teachers.

This toolkit is excellent for promoting teaching and early recruitment. It presents guidelines for establishing and evaluating teacher career academies; identifying prospective teachers; and using

internships, portfolios, and a comprehensive array of supports for recruiting promising students to the profession.

Resource 13: North Carolina Model Teacher Education Consortium

North Carolina Model Teacher Education Consortium

Website: <http://www.ncmtec.com/>

“The North Carolina Model Teacher Education Consortium (NCMTEC) is a collaborative effort that provides affordable, accessible, high-quality education/training to aspiring and practicing educators in participating school districts in North Carolina.”

Resource 14: Future Educators Association, Phi Delta Kappa International

Future Educators Association

Website: <http://www.pdkintl.org/fea/feahome.htm>

Future Educators Association is a program for high school students interested in exploring careers in education. Chapters of the organization exist around the country, and Phi Delta Kappa provides support and ideas for getting the program started. An advisors handbook/manual is provided when a school or district joins.

Resource 15: Teacher Cadet Program at South Carolina’s Center for Educator Recruitment, Retention, and Advancement (CERRA)

CERRA Teacher Cadet Program

Website: <http://www.cerra.org/cadets/>

Through the Teacher Cadet Program, CERRA encourages academically able students who possess exemplary interpersonal and leadership skills to consider teaching as a career. CERRA also offers training to individuals who wish to become Teacher Cadet instructors.

Strategy 3: Create High-Quality Alternative Routes to Certification

Once candidates are interested in teaching and schools identify staffing needs, alternative routes to certification provide a path for moving certified teachers into the classroom. Alternative routes are often attractive to midcareer changers and other nontraditional prospective teachers who want to become certified teachers. A program's flexibility can allow teacher candidates to complete coursework and training toward certification while continuing to earn a living as a teacher of record, paraprofessional, or businessperson. Through collaborative efforts, states, districts, universities, and colleges can develop alternative routes that attract and prepare teachers to fill shortages in mathematics and science. No two alternative routes look alike, but researchers have begun to highlight several components of high-quality programs.

Resource 16: *Alternative Certification Evaluation Template*

North Central Regional Educational Laboratory. (2002). *Alternative certification evaluation template*. Naperville, IL. Author. Retrieved July 17, 2006, from <http://www.learningpt.org/page.php?pageID=205>

This online template is based on findings from a literature review of articles and reports presenting the results of evaluations of a variety of alternative certification programs. It presents essential evaluation criteria for characteristics of successful programs. Users rate the extent to which the criteria are used in a program, and averages for typical components of an alternative certification program are computed and graphed.

Resource 17: ABCTE's Project 5,000: Recruiting New Mathematics and Science Teachers for U.S. Schools

American Board for Certification of Teacher Excellence. (2006, May 11). *ABCTE to host 17 events to jumpstart mathematics & science teacher recruitment initiative: Project 5,000* [Press release]. Retrieved July 17, 2006, from <http://www.abcte.org/node/989/>

On May 11, 2006, the American Board for Certification of Teacher Excellence (ABCTE) launched a new initiative to recruit and certify 5,000 new mathematics and science teachers by the year 2009. ABCTE is a national nonprofit organization offering its alternative certification program, Passport to Teaching, to states that agree to accept its credentials.

To kick off this initiative, ABCTE is hosting 17 events in Florida, Idaho, Utah, and New Hampshire to spread the word about ABCTE's certification program for mathematics and science career changers. Some of the highest need subject areas are chemistry, physics, mathematics, general science, and biology.

Resource 18: North Carolina Teachers of Excellence for All Children (NC TEACH)

NC TEACH

Website: <http://ncteach.ga.unc.edu>

“NC TEACH is a rigorous alternative teacher preparation program designed to recruit, train, support and retain mid-career professionals as they become licensed teachers in North Carolina. The program is administered by the UNC Office of the President, in collaboration with the North Carolina Department of Public Instruction.”

NC TEACH has a new effort to attract mathematics and science professionals who are interested in becoming teachers. The site provides detailed descriptions of the organization, program offerings, and helpful resources.

Resource 19: *Alternative Routes to Teacher Certification*

Office of Innovation and Improvement. (2004). *Alternative routes to teacher certification*. Washington, DC: U.S. Department of Education. Retrieved July 17, 2006, from <http://www.ed.gov/admins/tchrqual/recruit/altroutes/report.pdf>

This booklet presents elements of effective alternative routes to certification and then profiles six promising programs.

Resource 20: *Ahead of the Class*

Clewell, B., & Villegas, A. (2001). *Ahead of the class: A handbook for preparing new teachers from new sources*. Washington, DC: The Urban Institute. Retrieved July 17, 2006, from http://www.urban.org/UploadedPDF/ahead_of_the_class.pdf

The handbook analyzes the Pathways to Teaching Careers model program for certifying returning Peace Corps volunteers and paraprofessionals. Using Pathways as a guide, it lays out the steps for developing an effective alternative route to certification, from forming a partnership to supporting teacher candidates.

Resource 21: Boston Teacher Residency

Boston Teacher Residency
Website: <http://www.bpe.org/btr/>

“The Boston Teacher Residency (BTR) is a one-year urban teacher preparation and certification program developed as part of Boston’s aggressive commitment to improving instruction in every classroom. During the 12-month program, Teacher Residents co-teach with a Mentor Teacher in one of Boston’s most effective schools, take coursework facilitated by exceptional teachers and university faculty, and receive \$10,000 during their year of service to a school. Teacher Residents earn a Massachusetts Initial Teacher License and a master’s degree in education from the University of Massachusetts/Boston, and work toward a dual licensure in Special Education.”

The website lays out the structure of the program and answers frequently asked questions.

Strategy 4: Streamline the Hiring Process

Many high-quality applicants for teaching positions are unfortunately discouraged by the bureaucracy of the hiring process. Well-qualified applicants often have grown frustrated and found other jobs by the time some schools and districts get around to calling them for an interview. At a time of great competition for mathematics and science teachers, especially at the middle school level, those school districts that have taken steps to simplify and streamline their hiring process will have an advantage over school districts bogged down by red tape and slow response.

Resource 22: *Missed Opportunities*

Levin, J., & Quinn, M. (2003). *Missed opportunities: How we keep high-quality teachers out of urban classrooms*. New York: The New Teacher Project. Retrieved July 17, 2006, from <http://www.tntp.org/docs/reportfinal9-29.pdf>

This report reveals the daunting hiring process that has plagued many urban school districts, preventing them from securing badly needed high-quality teachers for their classrooms. The authors suggest policy options for reforming hiring processes in urban schools.

Strategy 5: Offer Financial Incentives

Mathematics and science teachers at the elementary and middle school levels must demonstrate subject-matter knowledge or must have majored in the subject they teach. Those who choose a teaching career often forego promising careers and higher industry salaries to take on the challenges of teaching mathematics or science to elementary or middle school students. In an effort to recruit these teachers, state policymakers—in partnership with schools and districts—can consider offering financial incentives, including signing bonuses; student loan forgiveness offers; scholarships; housing assistance; and higher base salaries for teachers in hard-to-staff schools and subjects, such as mathematics and science.

Resource 23: *America's Pressing Challenge—Building a Stronger Foundation*

National Science Board. (2006). *America's pressing challenge—Building a stronger foundation: A companion to science and engineering indicators 2006*. Arlington, VA: National Science Foundation. Retrieved July 17, 2006, from <http://www.nsf.gov/statistics/nsb0602/nsb0602.pdf>

This report is a companion to *Science and Engineering Indicators 2006*, also published by the National Science Foundation. The report sounds an alarm regarding the low level of mathematics and science education in the country and calls on policymakers to implement certain policies, including improving the quality of mathematics and science teachers through more competitive compensation.

Resource 24: *Diversifying Teacher Compensation*

Azordegan, J., Byrnett, P., Campbell, K., Greenman, J., & Coulter, T. (2005). *Diversifying teacher compensation* (Issue Paper). Denver: Education Commission of the States. Retrieved July 17, 2006, from <http://www.ecs.org/clearinghouse/65/83/6583.pdf>

This issue paper provides a general overview of the issue of diversifying teacher compensation, reviews policy options, and provides a glance at the actions that states and districts have taken toward compensation reform.

Resource 25: *Better Pay for Better Teaching*

Hassel, B. C. (2002). *Better pay for better teaching: Making teacher compensation pay off in the age of accountability*. Washington, DC: Progressive Policy Institute. Retrieved July 17, 2006, from http://www.ppionline.org/documents/Hassel_May02.pdf

The 21st Century Schools Project at the Progressive Policy Institute advocates the need for differential pay for teachers in hard-to-hire subjects. It also offers policy options and considerations for reforming teacher compensation.

Resource 26: *An Exploration of the Pay Levels Needed to Attract Students With Mathematics, Science, and Technology Skills to a Career in K–12 Teaching*

Milanowski, A. (2003). An exploration of the pay levels needed to attract students with mathematics, science and technology skills to a career in K–12 teaching, *Education Policy Analysis Archives*, 11(50). Retrieved July 17, 2006, from <http://epaa.asu.edu/epaa/v11n50/>

This study explores the role of salary levels and other factors in motivating students to become mathematics, science, and technology teachers.

Resource 27: Alabama Mathematics and Science Scholarship/Loan Program

Teacher Education and Certification FAQs: Mathematics and Science Scholarship/Loan Program for Alabama Teachers (MSSPAT)

Website:

<http://www.alsde.edu/HTML/sections/teachercertAnswers.asp?section=66&sort=4&id=412&footer=sections>

“The MSSPAT provides up to \$2,000 per semester for up to six semesters for students admitted to a teacher education program in either mathematics or science at a public university in Alabama. One semester of funding will be forgiven for each year that the new teacher teaches mathematics or science full time in a target school system.”

Resource 28: Arkansas Emergency Secondary Education Loan Program

Arkansas Emergency Secondary Education Loan Program

Website: <http://www.arkansashighered.com/emergencyloan.html>

This program is for students pursuing secondary education teacher licensure in an accredited Arkansas public or private college or university in the following shortage areas: mathematics, chemistry, physics, biology, physical science, general science, special education, and foreign language. Merit-based scholarships are available for \$2,500 per academic year, or one-half the total cost of tuition/fees, book/supplies, and room/board. Recipients must maintain a 2.5 cumulative grade point average (GPA), and juniors and seniors must maintain a 3.0 GPA in their major area of study.

Resource 29: California Mathematics and Science Teacher Education Program

California Mathematics and Science Teacher Education Program

Website: <http://www.mastep.sjsu.edu/project2.htm>

This program makes available summer and part-time jobs related to science and mathematics to students in need. “An additional financial incentive to attract students into science and math teaching would be to guarantee future teachers summer employment in industry, government, or university during the first few years of their teaching career. Combined with this employment

would be a rewarding ‘in-service’ program of professional development leading towards a master’s degree.”

Resource 30: Louisiana Critical Teacher Shortage Incentive Program

Louisiana Critical Teacher Shortage Incentive Program

Website: <http://www.legis.state.la.us/lss/lss.asp?doc=81075>

Through this program, newly certified Louisiana elementary and secondary teachers in the areas of mathematics, biology, chemistry, physics, or special education receive \$3,000 per year for their first four consecutive years in the classroom.

Resource 31: Rhode Island Teacher Reward Program

Rhode Island Teacher Reward Program.

Website: <http://www.risla.com/programs/reward.aspx>

For the first four years of teaching in Rhode Island, there will be zero interest on Stafford loans (subsidized or unsubsidized). The program provides 250 awards to full-time teachers in the predicted shortage areas of mathematics or science. In order to qualify, one must be employed full time and certified by the state of Rhode Island. Minority applicants have high priority along with those teaching in an urban or high-needs school district.

Strategy 6: Support New Teachers in the Classroom

Research shows that one third of all new teachers leave within their first three years and half leave after five years (Kelley, 2004). Support for beginning teachers is critical to their success. Many schools and districts struggle to recruit mathematics and science teachers, so it makes good sense to support those teachers that have been hired. This support can be offered through induction, mentoring, and professional development. Quality programs have shown success in retaining new teachers.

Resource 32: *America's Pressing Challenge—Building a Stronger Foundation*

National Science Board. (2006). *America's pressing challenge—Building a stronger foundation: A companion to science and engineering indicators 2006*. Arlington, VA: National Science Foundation. Retrieved July 17, 2006, from <http://www.nsf.gov/statistics/nsb0602/nsb0602.pdf>

This report is a companion to *Science and Engineering Indicators 2006*, also published by the National Science Foundation. The report sounds an alarm regarding the low level of mathematics and science education in the country and calls on policymakers to implement certain policies, including better support for mathematics and science teachers through high-quality induction, mentoring, and professional development.

Resource 33: *Breaking Ranks in the Middle*

National Association of Secondary School Principals & The Education Alliance at Brown University. (2006). *Breaking ranks in the middle: Strategies for leading middle level reform*. Reston, VA: National Association of Secondary School Principals.

This report addresses what policymakers and school leaders can do to effectively implement reform at the middle school level. It argues that schools should build partnerships with institutions of higher education to provide teachers and administrators at both levels with ideas and opportunities to enhance the training, performance, and evaluation of educators.

Resource 34: *Success in the Middle*

National Middle School Association. (2006). *Success in the middle: A policymaker's guide to achieving quality middle level education*. Westerville, OH: Author. Retrieved July 17, 2006, from http://www.nmsa.org/portals/0/pdf/advocacy/policy_guide/NMSA_Policy_Guide.pdf

This report establishes goals and recommends specific policies for federal, state, and local policymakers to better support middle school students, teachers, and leaders. It promotes collaboration with colleges and universities to align administrator preparation programs with research-based leadership and instructional practices that have been shown to increase the academic performance and healthy development of young adolescents.

Resource 35: The New Teacher Center at the University of California, Santa Cruz

The New Teacher Center at the University of California, Santa Cruz.

Website: <http://www.newteachercenter.org>

The New Teacher Center provides a mentoring and formative assessment system that has been successfully operating for 15 years. The following reports from the New Teacher Center document positive effects on student achievement when new teachers receive comprehensive professional support.

Strong, M. (2006). *Does new teacher support affect student achievement? Some early findings.* (Research Brief 06-01). Santa Cruz, CA: The New Teacher Center. Retrieved July 17, 2006, from <http://www.newteachercenter.org/pdfs/NTCResearchBrief.06-01.pdf>

Villar, A. (2004). *Measuring the benefits and costs of mentoring-based induction: A value-added assessment of new teacher effectiveness linked to student achievement.* Santa Cruz, CA: The New Teacher Center.

Resource 36: Connecticut Beginning Educator Support and Training (BEST) Program

Connecticut Beginning Educator Support and Training (BEST) Program

Website: <http://www.state.ct.us/sde/dtl/t-a/>

BEST is a two-year program of mentoring that uses the portfolio review process for assessment of a new teacher's readiness for professional certification beyond initial certification. The program is mandatory for all new Connecticut teachers, regardless of certification status.

Resource 37: California Beginning Teacher Support and Assessment (BTSA) Program

California Beginning Teacher Support and Assessment (BTSA) Program

Website: http://www.btsa.ca.gov/BTSA_basics.html

This state-funded program is designed to support the professional development of new teachers.

Resource 38: Louisiana Framework for Inducting, Retaining, and Supporting Teachers (FIRST)

Louisiana Framework for Inducting, Retaining, and Supporting Teachers (FIRST)

Website: <http://www.doe.state.la.us/lde/pd/625.html>

The Louisiana Department of Education has developed this program to provide assistance and support to new Louisiana teachers during their first three years in the classroom. It has developed the following manual for districts that want to create induction programs—from agendas for orientation sessions to worksheets to fliers.

Louisiana Department of Education. (2001). *Louisiana FIRST: The induction component*. Baton Rouge, LA: Author. Retrieved July 17, 2006, from <http://www.doe.state.la.us/lde/uploads/916.doc>

Resource 39: *Learning for the 21st Century*

Partnership for 21st Century Skills. (2002). *Learning for the 21st century: A report and MILE guide for 21st century skills*. Washington, DC: Author. Retrieved July 17, 2006, from http://www.21stcenturyskills.org/images/stories/otherdocs/P21_Report.pdf

Using three domains of work (learning and teaching, leading and managing, and partnering) and a continuum of benchmarks (early stage, transitional state, 21st century), the *Milestones for Improving Learning and Education (MILE) Guide* presents a framework for self-assessment and planning professional development.

Resource 40: *Cultivating High-Quality Professional Development*

Exstrom, M., & Hirsh, S. (2002). *Cultivating high-quality professional development*. Denver, CO: National Conference of State Legislatures.

This comprehensive guide to teacher professional development is geared to policymakers. It includes four sections: frequently asked questions, a policy roadmap, snapshot of state actions, and resources for stakeholders in their work with state policymakers.

Resource 41: *Keeping America Competitive*

Coble, C., & Allen, M. (2005). *Keeping American competitive: Five strategies to improve mathematics and science education*. Denver, CO: Education Commission of the States. Retrieved July 17, 2006, from <http://www.ecs.org/clearinghouse/62/19/6219.pdf>

This report is the result of a gathering of top thinkers for a conference at the Wingspread Conference Center. It outlines five strategies to improve mathematics and science education, including support for teacher professional development and learning.

Resource 42: National Middle Level Science Teachers Association

National Middle Level Science Teachers Association
Website: <http://www.nmlsta.org/about.htm>

The National Middle Level Science Teachers Association works in association with the Middle Level Division of the National Science Teachers Association. Its goals include activities to support and grow middle-level teachers in their profession.

Real-Life Example: Colorado Partnership Supports Middle-Level Mathematics and Science Teachers

Five of Colorado's top universities are partnering with seven metro-area school districts for a project supported by the National Science Foundation called the Rocky Mountain Middle School Mathematics and Science Partnership.

According to the Front Range Board of Cooperative Educational Services (BOCES) for Teacher Leadership (n.d.), the goal of this project is to increase student achievement in Grades 6–8. Teachers will have the opportunity to participate in professional development to ensure that they not only are NCLB “highly qualified” but also that they are “highly effective” teachers. Participants will help create a cadre of teachers who will be mathematics and science leaders across the state. This project is designed to serve approximately 600 teachers during the five-year span, reaching out to approximately 8,900 sixth graders, 8,900 seventh graders, and 8,600 eighth graders.

Through this project, the partnership expects to achieve the following:

- Increase the number of highly qualified teachers, as defined by NCLB.
- Show significant growth in high-quality mathematics and science learning.
- Reduce achievement gaps in the mathematics and science performance of diverse student populations.
- Institutionally change the university recruitment and coursework preparation of current and future mathematics and science teachers.
- Research the coordination of university outreach with inservice teacher professional development.
- Move toward statewide endorsements of specialist in mathematics and specialist in science for middle school teachers.

Beginning in spring 2005, courses in mathematics and science are offered every semester over a 15-month period. It is anticipated that the coursework could be combined with additional hours for a master's degree. A certificate in middle school mathematics and/or science teaching will be developed by the University of Colorado at Denver faculty.

References

- Fideler, E. F., Foster, E. D., & Schwartz, S. (2000). *The urban teacher challenge: Teacher demand and supply in the Great City Schools*. Belmont, MA: Recruiting New Teachers. Retrieved July 17, 2006, from <http://www.cgcs.org/pdfs/utc.pdf>
- Front Range Board of Cooperative Educational Services (BOCES) for Teacher Leadership. (n.d.). *Rocky Mountain Middle School Math Science Partnership: 15 months to highly qualified* (NSF Grant Project Summary). Retrieved July 17, 2006, from http://www.frontrangeboces.org/documents/NSF_summary.doc
- Kelley, L. M. (2004). *Induction makes a difference* (Eye on Research No. 2). Boulder: University of Colorado, School of Education. Retrieved July 17, 2006, from http://www.colorado.edu/education/pdfs/EdResearch_Fall04.pdf
- Levin, J., & Quinn, M. (2003). *Missed opportunities: How we keep high-quality teachers out of urban classrooms*. New York: The New Teacher Project. Retrieved July 17, 2006, from <http://www.tntp.org/docs/reportfinal9-29.pdf>
- Milanowski, A. (2003). An exploration of the pay levels needed to attract students with mathematics, science and technology skills to a career in K–12 teaching, *Education Policy Analysis Archives*, 11(50). Retrieved July 17, 2006, from <http://epaa.asu.edu/epaa/v11n50/>
- The National Commission on Mathematics and Science Teaching for the 21st Century. (2000). *Before it's too late: A report to the nation from the national commission on mathematics and science teaching for the 21st century*. Washington, DC: U.S. Department of Education. Retrieved July 17, 2006, from <http://www.ed.gov/inits/Math/glenn/report.pdf>
- The National Forum to Accelerate Middle-Grades Reform. (2002). *Policy statement: Teacher preparation, licensure, and recruitment*. Retrieved July 17, 2006, from <http://www.mgforum.org/Policy/teacher/teacher.pdf>
- National Science Foundation. (2006). Chapter 1: Elementary and secondary education. *Science and engineering indicators 2006*. Arlington, VA: Author. Retrieved July 17, 2006, from <http://www.nsf.gov/statistics/seind06/pdf/c01.pdf>