Expanding Minds
Exploring Futures

Teaching Scholar Partnerships

Models linking community colleges with K-12 science and mathematics education

Supported by the National Science Foundation

Faith San Felice
Lynn Barnett
Expanding Minds, Exploring Futures: Teaching Scholar Partnerships

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The American Association of Community Colleges (AACC) is the primary advocacy organization for the nation's community colleges. The association represents 1,100 two-year, associate degree-granting institutions and more than 10 million students. AACC promotes community colleges through six strategic action areas: national and international recognition and advocacy, learning and accountability, leadership development, economic and workforce development, connectedness across AACC membership, and international and intercultural education. Information about AACC and community colleges may be found at www.aacc.nche.edu.

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Foreword

Qualified K-12 teachers are in short supply but high demand throughout the United States. Recognizing this dilemma, community colleges have expanded their K-12 teacher preparation programs, with special attention to preparing future science and mathematics teachers. With their strong ties to local business and industry, community colleges have the unique capacity to provide future teachers with an education that combines content, theory, and practical application. Teachers who are able to connect subject matter to real world careers in science, mathematics, technology or engineering can inspire their students to achieve higher levels of education and enhance their futures.

Expanding Minds, Exploring Futures describes a national pilot program supported by the National Science Foundation to give undergraduate students early field experience in K-12 schools, serving as classroom resources while getting a taste of a career in teaching. The American Association of Community Colleges, the Council of Independent Colleges, and the Independent Colleges Office developed the Teaching Scholar Partnerships (TSP) program, drawing students from their member colleges. This report, which focuses on lessons drawn from the experiences of the community colleges that participated in TSP over a two-year period, offers recommendations for other institutions interested in developing similar programs.

We wish to thank the National Science Foundation for its support of teacher education programs at community colleges. Through its grant programs, NSF has fostered strong partnerships at all levels of the education community from K-12 districts to community colleges and four-year colleges and universities. It is through these partnerships that our future teachers will receive an education that will prepare them to meet the challenges of the 21st century classroom.

George R. Boggs
President
American Association of Community Colleges
Overview: The Teaching Scholar Partnerships

Recognizing the national need for excellence in science and mathematics teaching and the need for new elementary and secondary school teachers in the United States, the National Science Foundation supported Teaching Scholar Partnerships (TSP) program. This 2001-2003 pilot project provided undergraduate college students with K-12 classroom experience in hopes that they would develop an interest in teaching as a career option. The project was led by the American Association of Community Colleges (AACC) in collaboration with the Council of Independent Colleges (CIC) and the Independent Colleges Office (ICO). Using partnerships and mentors, each organization engaged a cohort of selected community and four-year colleges and universities to participate in the project.

TSP focused on three primary objectives:

- Enrich and strengthen the learning experience of K-12 students in mathematics and science,
- Encourage undergraduate students in science, technology, engineering, or mathematics (STEM) fields to consider K-12 math or science teaching as a career option, and
- Generate national attention on the critical contributions that collaborative K-16 partnerships can make to ensure the vitality of local schools.

To achieve these objectives, each college and school built a TSP team that included faculty, administrators, and students. Collaborative partnerships and multilayered mentoring, central components of TSP, enriched the experience for all participants. College faculty and K-12 teachers mentored the college students, and the college students mentored elementary and secondary students. The national partner organizations engaged additional faculty and administrators from other institutions to serve as mentors and advisors to the TSP colleges.
Overview: The Teaching Scholar Partnerships

Each organization identified colleges that recruited and selected undergraduates majoring in science, technology, engineering, or mathematics to be part of the new TSP program. More than 200 college students from 10 community colleges and 18 four-year colleges and universities in 17 states participated as Teaching Scholars. They served nearly 19,000 hours in more than 300 elementary, middle, and secondary school classrooms. Approximately 120 college faculty, representing disciplines ranging from chemistry to computer science and marine biology, served as mentors to the undergraduate students.

TSP demonstrated the importance of collaborative K-16 partnerships in the enhancement of K-12 science, math, and technology curriculum and the development of effective teacher preparation programs. The relationships among college faculty, K-12 teachers, and undergraduate students supported and encouraged reciprocal teaching and learning opportunities. Participants reported the emergence of positive relationships as college and K-12 teams worked together to develop, implement, and revise their local programs. Table 1 summarizes the fundamentals of TSP.

<table>
<thead>
<tr>
<th>Table 1. Fundamentals of TSP</th>
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<tr>
<td>Partnerships with K-12 schools</td>
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<td>Recruitment of undergraduates in science, technology, engineering, or mathematics</td>
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<td>Process for selecting faculty and student participants</td>
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Teaching Scholar Partnerships at Community Colleges

TSP emerged at a time when community colleges were beginning to expand their teacher education programs, due partly to their student demographics. Community colleges attract local students who have direct ties to the college service areas. The ethnic, racial, and socioeconomic backgrounds of community college students mirror the larger community—a key point for policymakers seeking to attract new teachers with diverse backgrounds. Career-changers and individuals with bachelor’s degrees seeking additional training often turn to community colleges to further their education.

While attending community colleges, students in teacher education programs have the opportunity to explore the teaching career in their first two years of college. This early exploration provides some flexibility for the students, giving them time to identify the most suitable grade level and subject area of interest to them. It also allows students to determine whether or not teaching is the appropriate career for them. According to Investing in Tomorrow’s Teachers: The Integral Role of Two-Year Colleges in the Science and Mathematics Preparation of Prospective Teachers (NSF, 1998), it is estimated that 40 percent to 60 percent of future teachers take some or all of their math and science courses at community colleges. The community college’s relationships with local business and industry can provide opportunities for future science and math teachers to experience 21st century technologies in the workplace. Educators who can teach content and provide direct examples of its application in the workplace can inspire students to higher levels of education.
AACC selected 10 community colleges through a national, peer-reviewed grant competition and challenged them to design projects that drew on their expertise in meeting local needs. Each college was paired with a peer mentor from another community college who was selected through an independent application process. Mentors came to the project with expertise in a STEM discipline, teacher preparation, partnership development, or some combination of the three.

The community colleges drew on existing K-12 partnerships to develop 10 unique programs that addressed specific local goals and objectives. Many colleges expanded old partnerships or created new ones with local business or community organizations, or with neighboring four-year colleges and universities. These organizations were selected because of their interest in science, math, and technology education.

The community colleges in AACC’s TSP cohort reflected geographic, socioeconomic, ethnic, and racial diversity. They were rural, suburban, and urban institutions with enrollments ranging from 800 to 20,000 students. Two — designated as minority-serving and Hispanic-serving institutions — developed programs to address the specific needs of minority populations in their service areas. Figure 1 illustrates the geographic distribution of the 10 community colleges in TSP.

Figure 1.

Source: American Association of Community Colleges, 2004
Teaching Scholar Partnerships at Community Colleges

The number of community college students selected to serve as Teaching Scholars each semester varied by college—from three to 22. They ranged in age from 19 to 50 years old, and were racially and ethnically diverse. Approximately 43 percent of these students were male and 57 percent were female. More than 100 community college Teaching Scholars participated in K-12 classrooms from 2001-2003. Some were first-generation college students; others were returning students seeking additional degrees and certifications. Those with children in the local schools had the opportunity to be directly involved in their children’s education. Bilingual Teaching Scholars worked in bilingual and dual-language classrooms assisting students—and sometimes parents—with science and math skills.

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<th>Table 2. Teaching Scholar Partnerships at Community Colleges, 2001-2003</th>
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<td><strong>FIELD PLACEMENTS</strong></td>
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<td>Central Florida CC</td>
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<td>Cerritos College</td>
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<td>Delta College</td>
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<td>Ivy Tech State College – Bloomington</td>
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<td>Waycross College</td>
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This report summarizes the experiences of community colleges that participated in the TSP pilot. See Table 2 for an overview of the community college programs. Based on lessons derived from strategies used at widely differing institutions and locales — and documented through interviews, focus groups, surveys, and self-reported data — the report offers recommendations for other community colleges and schools wanting to implement similar efforts in their communities.
Establishing Partnerships

“TSP [brought] important partners together to form an alliance to reach students who ordinarily wouldn’t go into teaching, and it enriched education experiences for K-12 students.”

—AACC Mentor Team Member

Planned collaboration allowed community colleges and K-12 schools in the colleges’ service areas to enhance academic programs, provide in-service training to current science and math teachers, and recruit future K-12 science and math teachers from the local area. Establishing and maintaining effective collaborative partnerships required reciprocal dedication and commitment, including an understanding of the needs of all parties and a willingness to address those needs directly. For that reason some TSP teams included representatives from community-based agencies such as a wildlife sanctuary or an after-school program. The following suggestions were drawn from the collective experiences of the TSP community colleges.

Recommendations for establishing K-14 partnerships

• Communicate the program goals to potential partners and stakeholders in a clear, coherent way.

• Ensure that everyone involved understands the process of instituting a new program at the college, the culture of the K-12 school and college, and the process of working within those cultures to garner support for the program.

• Acknowledge current relationships and partnerships between the community college and local K-12 schools. Honor what is in place but expand it through the new program.

• Work with school administrators to identify the needs of the K-12 community and determine whether the proposed program can meet those needs.

• Ask K-12 teachers about their specific classroom needs and determine whether the program can meet those needs. Clarify the responsibilities of K-12 teachers serving as mentors, including expectations for their time commitment and involvement with undergraduate students.
Recruiting Community College and K-12 Mentors

Community college and K-12 mentors found the TSP program personally and professionally rewarding despite a time commitment that ranged from one semester to two years. The most effective mentors exhibited several key characteristics: flexibility, open-mindedness, a can-do approach, and a passion for teaching. Many were master educators with a personal commitment to community service. Mentor responsibilities extended well beyond classroom observation of the Teaching Scholars in the schools. Depending on the program design their responsibilities included:

- Organizing and delivering orientation activities for the Teaching Scholars
- Helping Teaching Scholars plan and deliver presentations
- Monitoring the Teaching Scholars in the classrooms
- Evaluating their lesson plans
- Modeling inquiry-based teaching
- Attending team planning and advisory committee meetings
- Participating in program evaluation
- Promoting the TSP program on the college campus and in the K-12 schools.

Central Florida Community College Teaching Scholar
Jonathan Harris leads a math activity for middle school students.
Participants reported that recruitment of community college faculty and K-12 teachers should emphasize the potential benefits for them and their students. Recommendations from college deans and division chairs, and from school and district administrators, were particularly useful in identifying educators whose personality and teaching styles were compatible with partnerships and community involvement.

“It is an honor to be asked to guide our future teachers.”
— K-12 Teacher
Recommendations for recruiting community college faculty

- Send a letter or e-mail announcement to potential candidates who are expected to have an interest in participating, with an emphasis on notifying those candidates respected by their peers.
- Offer stipends or supplemental pay, if possible, under conditions that adhere to institutional policy.
- Emphasize the professional development opportunities available, including networking with peers and others, attending and presenting at conferences, and, potentially, contributing to publications or other outreach activities.
- Talk to college deans to arrange release time for participating faculty.

Recommendations for recruiting K-12 teachers

- Explain that the program offers a way to gain additional assistance in the classroom. Teaching Scholars are trained classroom volunteers committed to assisting teachers, and learning about teaching as a career.
- Describe the program as a professional development opportunity that provides teachers with direct access to science, math, and technology resources at the community college.
- Highlight how current K-12 teachers will have a voice in the training and preparation of future K-12 teachers. Explain how they can work together with the college to design and implement the program.
Teaching Scholars

“I’m really grateful to be a part of your scholars program. I will do my best to make you proud of me.”
—Teaching Scholar

Recruitment of Teaching Scholars
The methods used to recruit Teaching Scholars varied from college to college depending on the program duration and target population. Some colleges expected a two-year commitment from students; others, just one semester. Although the focus was on undergraduates from STEM programs, some Teaching Scholars were already enrolled in education programs. Cohort size was important as the number of Teaching Scholars who could be observed and trained effectively varied by institution. Teaching Scholars were a highly select group of students; nevertheless, they needed substantial individual attention to be successful in the program.

Recommendations for recruiting Teaching Scholars
• Encourage college faculty to recommend students who would be good candidates.
• Interact directly with potential Teaching Scholars through classroom presentations and campus information sessions.
• Identify students with a strong commitment to the community and local K-12 schools.
• Conduct advising sessions with students.
• Encourage students who participated in the K-12 classroom experience to share their observations with other students. Do not underestimate the value of word of mouth communication.
• Outline qualifications and a Teaching Scholar “job description” with assistance from an advisory committee.
• Offer student incentives (e.g., stipends, tuition-free credit in math and science courses, team gear such as T-shirts and hats, fulfillment of qualifications for entry into four-year education program).
The Teaching Scholar Selection Process

“I am a mother, a student, and English is my second language. I know the struggle parents go through in order to get their kids excited about school. I know first-hand the busy life of a student. I know the obstacles faced by people whose first language is not English, and I know how to overcome the obstacles.”

—Teaching Scholar

TSP project directors felt that student selection criteria were particularly important because the Teaching Scholars would be serving in the schools as representatives of the community colleges. Some TSP team members intentionally designed selection processes that mimicked real-world hiring practices.

Most community colleges required that each candidate submit an application form consisting of a written essay describing interest in the program, a list of college courses and grades that demonstrated competency in STEM subjects, and a list of related experiences. After reviewing the application forms the TSP teams scheduled candidate interviews that were conducted jointly by community college faculty and K-12 teachers. In some cases, due to state or local regulations, background checks were required of the candidates. Those students selected to participate in TSP were asked to sign a contract outlining expectations and responsibilities. TSP project directors suggested that a lawyer review all contracts and hiring practices before recruitment and selection. Although each of the TSP programs had unique requirements that reflected campus goals and objectives, some expectations were common to all sites and could be generalized to most colleges such as partnerships, mentoring, teamwork, and field experiences.
TSP teams discussed potential challenges directly with the candidates, which included time commitment, scheduling, and transportation. The flexibility of the candidate’s lifestyle, maturity level, and “employability skills” were all considered in the final selection process.

Recommendations for selecting Teaching Scholars

• Clarify expectations and responsibilities of Teaching Scholars and develop an application form and review process for selection.

• Ensure that students understand their responsibilities:
  • Complete all necessary academic requirements including, but not limited to, developing and presenting one or more lessons to a K-12 class
  • Attend mandatory orientation sessions
  • Tutor K-12 students
  • Write reflective journal essays
  • Participate in program evaluations
  • Work in a K-12 classroom a set number of hours per week
  • Understand the importance of professionalism in the workplace (i.e., dressing and acting professionally, following school building rules, understanding and following all necessary building safety procedures, and being punctual)
  • Be a role model to K-12 students.

Orientation for Teaching Scholars

Orientation was a mandatory component of the TSP program and failure to attend was grounds for removal from the program. For many, program orientation was an ongoing process which provided Teaching Scholars with support throughout the program.

For many Teaching Scholars, participation in the TSP program was their first experience with K-12 education from a teacher’s point of view. Most needed logistical, pedagogical, and professional information, such as how to demonstrate a
concept to a particular group of students. Orientation session topics were dictated by Teaching Scholar cohort characteristics and the overall goals of the program.

If students were already enrolled in a pre-service teacher preparation program, the TSP orientation activities focused on STEM content information to supplement the education courses. If students already demonstrated abilities in STEM-related subject areas, the orientation focused on pedagogical training that would help them communicate their knowledge of science and math effectively to K-12 students.

The number of hours spent in orientation sessions varied based on the college’s program goals. Orientation activities were generally applicable to multiple audiences, including current K-12 teachers, participants in service learning education programs, teacher aides, and paraprofessionals. A well-planned orientation program reinforced the important connections between the Teaching Scholars and the community college and K-12 mentors, making it essential to include community college and K-12 mentors in the orientation planning and delivery.

**Recommendations for student orientation topics**

- Inquiry-based learning and instructional models
- Learning styles
- Best practices in science and math teaching
- Science and math standards
- Assessment
- Mock teaching sessions
- Classroom management and motivation
- Time management
- Safety in the classroom
- Meet-and-greet sessions at the K-12 schools to introduce the school and all participants.
Advisory Committee

Some of the community college TSP teams created advisory committees to bring together various community stakeholders with an interest in education. According to many project directors, the ideal membership included K-12 principals and superintendents; two- and four-year college and university representatives; K-12 science, math, and technology teachers; community-based agency representatives; and representatives from local businesses and foundations. Advisory committees provided project oversight and ensured academically rigorous programs.

Recommendations for creating an advisory committee

• Outline program goals and objectives before appointing the advisory committee.
• Select individuals who are interested in the program and who have the authority to support the partnership. Members should be advocates for the program within the larger community as they are essential for program sustainability and publicity.
• Meet regularly with structured agendas.
• Inform committee members of program events and activities and encourage their regular, active involvement with the college and TSP team.
• Appoint one team member to organize advisory committee meetings, draft agendas, and manage communication between members.

Delta College Teaching Scholar Akira Addo and K-12 mentor Demetrios Swilley team teach an environmental science lesson for middle school students.
The national TSP project adopted a multilevel evaluation plan that addressed its numerous partnerships. These partnerships included three national organizations, 28 two- and four-year public and private colleges, more than 300 elementary, middle and secondary classrooms, and K-12 mentor teachers and students. Although the two-year duration of TSP was not conducive to a long-term quantitative study, program evaluators at the local and national levels were able to gather a significant amount of qualitative data through structured interviews, focus groups, surveys, and formal reports. Project directors were asked to keep a record of participants, service experiences, disciplines represented, and the number of Teaching Scholars interested in continuing a course of study leading to K-12 teacher certification in a STEM field in order to supplement the qualitative information. Table 3 shows the discipline areas represented by participating community college faculty and Teaching Scholars. Evaluation frequently focused on the effectiveness of the K-12 college partnerships, the Teaching Scholars, and the overall program.

Table 3. Disciplines of Community College Mentors and Teaching Scholars, 2001–2003

<table>
<thead>
<tr>
<th>COMMUNITY COLLEGE MENTORS</th>
<th>TEACHING SCHOLARS</th>
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<tbody>
<tr>
<td>biology • career counselor • chemistry, computer science • design technology • earth science • education • electronics technology • English/pre-education • geology • marine science • mathematics • physical science • physics</td>
<td>aerospace engineering • biology • business administration • chemical engineering • chemistry • computer information systems • computer science • design technology • earth science, economics • education • electrical engineering • electronics technology • elementary education • general technical studies • geology • health science • kinesiology • liberal arts and sciences • marine biology • marine science • mathematics • medical technology • middle school education • natural resources management • nursing • physical science • physics • pre-med • pre-pharmacy • respiratory therapy • secondary education • veterinary technology</td>
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Evaluation and Outcomes

An analysis of participant interviews conducted by the program evaluator indicated that the TSP program was successful in the following areas.

- **Enrich K-12 students’ learning experiences.** Teaching Scholars prepared lessons in subjects ranging from algebra to environmental biology. Some Scholars adapted existing standards-based lessons and materials or developed unique enrichment kits to supplement the curriculum. Teaching Scholars motivated at-risk and low-performing students to achieve grade-level academic goals. The K-12 mentors noted increased classroom participation and improved school attendance by at-risk students during the Teaching Scholars’ internships.

- **Promote STEM teaching as a career option.** TSP presented a real worldview of teaching and the K-12 education system. The time spent in the classroom inspired around 51 percent of Teaching Scholars from two- and four-year institutions to pursue a teaching career (see Table 4). Only some of the community college students had expressed an interest in teaching prior to their TSP field experiences. For those Scholars who decided not to teach by the end of the program, the experience generated a greater appreciation for teachers.

- **Emphasize the importance of collaborative partnerships.** TSP demonstrated that collaborations between K-12 and higher education enhance a K-12 community’s ability to respond to state and federal mandates for math and science. K-12 mentors and their students welcomed the additional subject knowledge, pedagogical tools, and, in some cases, equipment provided by the Teaching Scholars and the community college faculty.

- **Focus national attention on K-16 partnerships.** The 28 individual TSP programs garnered local attention through community and campus media. The Teaching Scholar Partnerships project was promoted nationally by the AACC, CIC and ICO via membership newsletters, newspaper articles, videos, and presentations at national meetings and conventions.

“This program gave me a totally different perspective and appreciation for teachers. When I transfer, I am going to strongly consider being a science teacher.”

—Teaching Scholar
Evaluation and Outcomes

A sample of evaluation tools includes the following:

- Surveys for K-12 students, Teaching Scholars, and mentors (community college and K-12)
- Log sheets completed by Teaching Scholars to record time spent in the K-12 classrooms
- Reflection essays written by Teaching Scholars and K-12 mentors
- Videotapes of Teaching Scholars presenting practice lessons to their peers and actual lessons to the K-12 students
- Presentations for advisory committees by Teaching Scholar teams
- Focus groups and one-on-one interviews with project participants
- Pre- and post-tests of Teaching Scholars to assess level of interest in K-12 STEM teaching

The impact of TSP on the K-12 students was assessed by means of the following:

- Content-based assessment measures (e.g., quizzes and exams) given to the K-12 students by Teaching Scholars and the K-12 mentors
- K-12 student letters
- Surveys of Teaching Scholars completed by K-12 students and teachers.

Table 4. Teaching Scholar Partnerships: Summary Participation Data, 2001-2003

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<th>Category</th>
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<tr>
<td>94 K-12 schools</td>
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<tr>
<td>28 community colleges and four-year colleges and universities</td>
</tr>
<tr>
<td>200+ Teaching Scholars (including 100+ community college students)</td>
</tr>
<tr>
<td>300+ elementary and secondary classrooms</td>
</tr>
<tr>
<td>18,512 hours of undergraduate service in K-12 classrooms</td>
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<tr>
<td>120+ higher education faculty mentors (including 44 community college faculty and administrators)</td>
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<tr>
<td>115 Teaching Scholars (51 percent of all Teaching Scholars) planned to pursue a course of study leading to an education degree and a K-12 teacher certification in science or math at the end of the program</td>
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The success of the TSP program at community colleges is indicative of the growing interest in establishing teacher education programs at community colleges. Strengths of the community college that contribute to such successes are a diverse student population, a mission to enhance career opportunities in the local community, strong relationships with local industry, and a commitment to teaching.

“I greatly appreciated the connections my [K-12] students made with the college. They feel so much more a part of the local academic community, and they have learned that [the community college] is a resource for them to use—and for their families—as they plan their futures.”

—K-12 Teacher
Sustaining Teacher Preparation Partnerships

The community college TSP grants came with an understanding that the institutions should seek ways to keep their partnerships viable beyond the grant funding period. Project directors and team members worked together to promote their TSP programs to key decision makers on campus and in the community.

TSP teams that were able to maintain their programs attributed their successful program outcomes to a number of factors that were seen as major selling points.

- **Community impact.** TSP pilot projects involved a relatively small number of community college students but affected many more members of the local community.
- **Growth opportunities.** TSP provided professional development for current community college faculty and K-12 teachers.
- **College visibility.** TSP provided positive publicity for the college by directly addressing a serious issue: the demand for highly qualified science and math teachers.
- **Academic impact.** Although it was not designed as a service learning program, the TSP classroom experiences sometimes fulfilled college service learning requirements and, depending on articulation agreements, sometimes met credit requirements for transfer students.
- **College recruitment.** TSP served as a recruiting tool by reaching K-12 students and their parents, both are potential community college students.

**Recommendations for developing and sustaining programs**

- Connect program goals and objectives to the overall mission of the community college.
- Assess the community college campus landscape, including administration and grant management team, to identify key supporters.
- Include business partners on the advisory committee.
- Create reusable teaching kits or equipment for multi-year use, if applicable.
- Write a program manual for all participants outlining goals, objectives, activities, and important contact information.
Sustaining Teacher Preparation Partnerships

- Develop and enforce articulation agreements with education programs at four-year colleges that will recognize and award credit for the Teaching Scholars’ classroom experiences.
- Establish or expand Future Teachers Clubs at local high schools and at the community college to encourage interest in teaching careers.
- Develop a list of local, regional, national, and federal funding organizations including college foundations, businesses, and service clubs that might provide financial support. Look into options with work-study programs.
- Communicate possible story ideas that relate to important issues in the community to local and campus media outlets.

Delta College Teaching Scholars Misako Johnson and Doug Nassif complete an acid rain experiment for high school students.
Unexpected Benefits

The positive relationships that developed between the TSP community colleges and their K-12 partners yielded some unexpected benefits. Team members reported that the program bridged gaps, provided new opportunities, and increased awareness of the college. Examples include the following:

- **Community relations.** TSP increased K-12 students’ awareness of the college environment.
- **College as a resource.** TSP increased awareness that the community college is a resource for K-12 teachers in all disciplines.
- **Pedagogy.** TSP bridged the gap between K-12 and community college teaching methodologies. Educators at both levels learned to incorporate inquiry-based pedagogy into their lessons. Community college faculty became more familiar with standards-based teaching in K-12 education.
- **Reflection on teaching.** Teachers found that they had opportunities to reflect on their own teaching practices and observe their own students’ learning in a different way.
- **New viewpoints.** TSP provided opportunities for team teaching with the K-12 mentors, the community college mentors and the Teaching Scholars. According to an elementary math teacher, “It is always better to have two heads thinking about the same goals.” Other K-12 teachers were grateful to have an “extra pair of eyes” in the classroom observing and assisting the students.
- **Local role models.** Because they were native community members, community college Teaching Scholars were believable role models. Often coming from the same neighborhoods as the K-12 students, they reflected the students’ culture and language. Their presence in some classrooms encouraged at-risk students and students from underserved populations to think about higher education for the first time.
Asnuntuck Community College (ACC) saw its TSP After School Program as a partnership with the After School Program, which is a community-based remedial program for at-risk children. The college team recruited from its students in computer information systems, mathematics, and engineering. Those selected as Teaching Scholars were trained in teaching methods, student observation, presentation skills, classroom behavior management, and alternative assessments during a six-week period.

The Teaching Scholars used ACC’s computer labs to teach fourth and fifth graders proper computer etiquette, keyboarding, basic computer skills, and Microsoft Office and Internet Explorer applications. Through the weekly one and a half hours of computer instruction, the elementary students gained competence in word processing reports and assignments. Teaching Scholars evaluated student progress through pre- and post-testing in keyboarding skills and basic computer applications. The elementary students produced personalized books using graphics programs and digital images with assistance from the Teaching Scholars. After a successful national TSP conference in 2003 led by AACC and the other national partners, Asnuntuck faculty were inspired to replicate the experience locally.

Central Florida Community College (CFCC) Teaching Scholars were required to commit to two years in the TSP teacher preparation program. During the first year the program focused on recruiting, selecting, and training Scholars from mathematics and science. In return, the college awarded free tuition for nine credit hours in science or math.

The first-year orientation included a series of workshops dedicated to topics such as learning styles, technology in the classroom, and best practices in math and science teaching. Classroom observations and tutoring students provided Teaching Scholars with insight into the K-12 classroom and the middle school culture. During the second year,
Teaching Scholars assisted in middle school classrooms under the supervision of the classroom teacher and the community college team members. The Teaching Scholars and the TSP team took a field trip to the National Aeronautic and Space Administration’s Kennedy Space Center to discuss ways to incorporate aerospace science into the middle school curriculum. At the end of the second year, the college hosted a one-week math and science summer camp for middle school students. This camp was designed and implemented by the Teaching Scholars with supervision from the community college and K-12 mentors. In addition to hands-on physical science activities, the Teaching Scholars introduced the middle school students to possible science and math careers through visits to the college’s health occupations laboratories and an anatomy and physiology lab session.

Cerritos College
Norwalk, California
Partner: Bellflower Unified School District Intensive Learning Center

The TSP grant allowed Cerritos College to expand its Teacher TRaining ACademy (Teacher TRAC) program into a formal pathway for future K-8 teachers of math and science. Cerritos serves a culturally diverse community in southeastern Los Angeles County, where the teacher preparation programs address the growing need for K-12 teachers from underrepresented populations.

Seven undergraduates worked alongside master math and science elementary teachers during the initial grant period in a California Distinguished School, which is located in an Empowerment Zone, a federal initiative to create areas of economic opportunity. The level of collaboration between the community college and K-12 mentors not only supported the Teaching Scholars’ efforts in the classrooms but also promoted reciprocal reflection as the professional educators assessed and expanded their own teaching styles and philosophies. In addition to extensive classroom observations, lesson planning, and presentations, the Teacher TRAC-TSP included a Student-for-a-Day program, a hands-on math and science event for students and teachers from the partner elementary school. The science and math activities were prepared and presented by the Teaching Scholars and community college faculty. After this event, one of the K-6 teachers designed a project “to personalize the elementary students’ connection to the community college.” The fifth and sixth graders in the project created personalized two-semester schedules based on their own future goals. As a result of the class project, they realized that college was the path they could follow to achieve their dreams.
Teaching Scholars transferred to the college’s partner university (California State University-Long Beach) to complete their education degrees and single-subject teaching credentials. The Teaching Scholars continued to confer with the Cerritos College TSP team as they completed their bachelor’s degrees and formal student teaching assignments.

Delta College
University Center, Michigan
**Partners:** Central Middle School • Coulter Elementary School • Emerson Elementary School • Jones Elementary School • Saginaw High School • Webber Middle School

Delta College, located in a suburb of Saginaw, designed its TSP program to increase the participation, academic achievement, and retention of underrepresented populations in science and mathematics. The program evolved from an existing partnership between the college and the School District of the City of Saginaw that focused on science education and a district wide, community-based Growth and Afrocentric Program. The Delta College model included an active advisory board consisting of current and retired middle and high school teachers and administrators, and community college faculty and administrators.

Teaching Scholars received training in inquiry-based instructional models, state science and math standards, classroom management techniques, laboratory safety, instructional skills, and assessment techniques. The Teaching Scholars worked with the community college and K-12 mentors and served in the K-12 classrooms for nine to 14 hours per week. They thus were able to share educational resources, and provide technology-based curriculum such as computer-assisted instruction and Internet-delivered assignments. Inquiry-based labs were designed by the community college mentor and Teaching Scholars to improve middle and high school students’ comprehension of science content and the scientific method. Support and assistance from the Teaching Scholars encouraged at-risk middle and high school students to participate in local science and math competitions. The extra preparation and attention given to the students yielded positive results: The students received top honors in both competitions.
Ivy Tech State College-Bloomington
Bloomington, Indiana

**Partner:** Bloomington High School North

Ivy Tech State College-Bloomington expanded its Adopt-A-School Partnership program with Bloomington High School North, through TSP. Teaching Scholars worked in the classroom for three to five hours each week. An orientation session and biweekly meetings with the Ivy Tech faculty mentors provided the training and support for the Teaching Scholars as they prepared to work in the high school classrooms. Teaching Scholars and high school mentors also participated in Certified Instructional Webmaster training. The project director and community college mentor required that all Teaching Scholars develop and implement an interdisciplinary project and maintain a journal during the course of the program.

The TSP experiences combined classroom observation and selected field activities with an opportunity to reflect on and evaluate the learning environments in collaboration with teaching professionals. Teaching Scholars gained experience in lesson planning, direct instruction of students, development of curriculum materials, and effective use of technology in the high school classroom.

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Lansing Community College
Lansing, Michigan

**Partners:** Fairview Elementary School • Forest View Elementary School • Gateway Elementary School • Schavey Road Elementary School • Pattengill Middle School • St. Johns Middle School • East Lansing High School • St. Johns High School • Okemos High School

The TSP teams at Lansing Community College worked in elementary, middle, and high school classrooms. Teaching Scholars completed a minimum of 50 hours of preparation, K-12 classroom observation, and presentation. An orientation workshop and a midsemester best practices seminar engaged the Teaching Scholars in discussion and reflection on issues related to teaching and learning. The K-12 mentors determined the degree of classroom participation for each Teaching Scholar. This structure provided a wide variety of experiences ranging from individual tutoring sessions to group activities, both small and large.

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Community College Participants: Teaching Scholar Partnerships, 2001–2003

The Teaching Scholars attended the best practices seminar with their college and K-12 mentors, which allowed experienced teachers to share their classroom wisdom with the undergraduates. All TSP team members were encouraged to chronicle their experiences in reflective journals. In addition, the Teaching Scholars developed portfolios to highlight their TSP experiences and to document their science and math lesson plans. A college-hosted Community Forum showcased their achievements; members of the local educational community and students’ families attended this event.

Northwestern Connecticut Community College
Winsted, Connecticut

Partners: Barkhamsted Elementary School • Northwestern Regional High School • Sharon Audubon Center

The PArtnering in Learning Science Project (PALS) at Northwestern Connecticut Community College was developed to increase the number of science teachers in the local area—a rural part of the state. PALS encouraged freshmen and sophomore level science college students to apply for the program and explore teaching as a career. The PALS program was designed in collaboration with the community college faculty and teachers from the participating K-12 schools. Inclusion of the K-12 teachers as true partners in the initial planning and design guaranteed that the PALS program goals specifically addressed the particular needs of each school. Two K-12 teachers assumed leadership roles for the program at their respective schools. They monitored progress and ensured that the needs of each school—and each classroom—were being met. The Sharon Audubon Center, a nature center and wildlife sanctuary in Sharon, Connecticut, was also a partner of the project.

PALS allowed community college students to spend 30 hours per semester in the classroom assisting the students and the teachers with hands-on science activities. The Teaching Scholars used science enrichment kits with accompanying lesson plans to teach the K-12 students, which enhanced the existing classroom science curriculum. K-12 and community college science faculty mentors assisted the Teaching Scholars in the lesson planning, development, and presentation. The enrichment kits explored topics such as simple machines, bird identification, matter, the human body, water ecology, and biotechnology. The water ecology unit included a field study project at a local state park for 30 high school students. The kits were designed for long-term use and were made available for use by the partner schools beyond the grant program.

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Orange Coast College’s Teaching Science Together program is a collaboration between the college and the local Newport-Mesa Unified School District. Teaching Scholars—who commit to one semester with the option of continuing for a second semester—were required to attend and complete a one-unit directed studies course taught by the community college mentor. The seminar class concentrated on the nature of science and science education in California. Teaching Scholars learned about California state standards in science and mathematics and the sequence of science topics taught in the K-12 system. They also received instruction on state-mandated testing and the impacts of the test scores on teachers, administrators, and schools. Beckman@Science, a local science education organization dedicated to improving science education in Orange County, provided guest speakers. The latter half of the semester was devoted to discussions of the Teaching Scholars’ teaching experiences.

A K-12 coordinator placed the Teaching Scholars with selected master science and math teachers at the elementary, middle, and high school levels. Teaching Scholars spent 35 to 40 hours per semester in the K-12 classroom under the supervision of the K-12 mentor. Teaching Scholars tutored students, worked with small groups, and presented at least one mandatory whole class lesson. All lessons were directly related to the classroom curriculum and aligned with the California State Science or Mathematics Standards. Teaching Scholars also participated in the college’s annual Science Night, a science and math fair for local elementary, middle, and high school students and their families. More than 800 community members participated in the event in Spring 2003.
South Mountain Community College
Phoenix, Arizona
Partners: Cesar Chavez High School • Valley View Elementary School

South Mountain Community College used its TSP grant to expand its existing Dynamic Learning Program, a grow-your-own pre-service teacher education program. The college’s partner schools reported a need for more teachers who reflect the demographic changes in the south Phoenix area. They specifically requested bilingual and teachers of English as a Second Language who were also trained in math, science, and technology. The cohort of Teaching Scholars progressed through a four semester, nine-hour block of thematically integrated courses that included inner-city field experiences at the elementary and high school levels. Through a strong partnership between South Mountain and the College of Education at Arizona State University, all Dynamic Learning students and Teaching Scholars met the requirements for admission into the professional teacher education program at the university.

Teaching Scholars spent 25 to 30 hours per semester in the K-12 classrooms observing teachers and students, keeping journals, planning lessons, tutoring, and teaching whole-group lessons. They also assisted K-12 students with science projects for an elementary Science and Math Fair, planned math stations for the fair, and organized additional math workshops for Spanish-speaking parents and children. The Science and Math Fair was successful, with many activities that engaged elementary school students and their parents.

Waycross College
Waycross, Georgia
Partner: Wacona Elementary School

Waycross College is part of the University System of Georgia, and serves eight counties in southeast Georgia. The college’s Activity-Based Science Program sought to encourage inquiry-based science activities in K-5 classrooms, with community college science majors serving as collaborative assistants to the classroom teachers. The project director required that the Teaching Scholars fulfill one semester with the option of remaining in TSP for a second semester. The undergraduates worked
in teams of two or more to develop elementary science activities based on Georgia’s state-mandated K-12 Quality Core Curriculum. These activities were designed to supplement classroom instruction. Teaching Scholar groups presented to multiple classrooms under supervision of the elementary school teachers, the project director, and the community college mentor.

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<th>Community College Participants: Teaching Scholar Partnerships, 2001–2003</th>
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Teaching Scholar Partnerships web site: http://www.aacc.nche.edu/tsp


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