

# The Impact of a Grant-Funded Project on Selected Community College Teacher Education Programs

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Recent concern about the quality and supply of teachers in mathematics and science has prompted a rethinking of how teachers in these content areas are recruited and prepared. This article describes a project, funded by the National Science Foundation and undertaken by Phi Theta Kappa, to strengthen the mathematics, science, and technology components of 36 community college teacher education programs. The impact of the program is examined on the basis of a survey of representatives from those colleges and the 4-year institutions that partnered with them. The article also examines the characteristics of 7 community colleges that emerged as the winners of a national competition on science and mathematics teacher education that was conducted as part of the project.

**Keywords:** *community college teacher education programs; teacher education articulation; National Science Foundation grant impacts, best practices—teacher education*

The community college role in teacher education is not new. Prior to World War II, teacher education was a primary mission of many junior colleges (Hutcheson, 2002). When the requirement for teacher certification increased to a bachelor's degree, community colleges became primarily a vehicle to help prepare teacher education students through the transfer

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process. This traditional role has now been extended to include the development of statewide associate of arts in teaching degrees, the delivery of alternative teacher certification programs for college graduates, the creation of community college baccalaureate degrees in teacher education, and the provision of in-service training by community colleges for the local teaching corps. These activities have sparked a renewed interest in community college efforts to supply an increasing number of the teachers needed to staff classrooms in the United States (Townsend & Ignash, 2003).

In March 1998, the National Science Foundation (NSF) highlighted the important role that community colleges can and should play in preparing K-12 teachers by sponsoring a workshop to explore issues related to the education of science, mathematics, and technology teachers. This resulted in the NSF's 1998 publication, *Investing in Tomorrow's Teachers: The Integral Role of Two-Year Colleges in the Science and Mathematics Preparation of Prospective Teachers*. As a consequence, many community colleges across the country decided to expand and promote the science and mathematics courses offered in their teacher education programs for current and future K-12 teachers.

The NSF continued its work with community colleges in 2001 by awarding Phi Theta Kappa (PTK), the International Honor Society of the Two-Year College, in partnership with the American Association of Community Colleges, funding for a project called Preparing Tomorrow's Science and Mathematics Teachers: The Community College Response. As "the largest honor society in American higher education with more than 2 million members and 1,200 chapters" (PTK, n.d.), PTK was well positioned to run a national project whose purpose was to expand and enhance community college teacher preparation programs for future K-12 science, mathematics, and technology teachers. This article describes the project, examines the characteristics of seven community colleges that emerged as the winners of a national competition on science and mathematics teacher education that was conducted as part of the project, and concludes with a discussion of the project's impact as determined by Web-based surveys sent to the participating 2-year and 4-year colleges.

### The NSF-PTK Project

The project, undertaken from 2001 to 2005, consisted of two rounds of funding. In the first round, seven mentor teams worked with 18 competitively selected community colleges that were partnered with one or more

4-year schools. In the second round, PTK mentors worked with an additional 18 community colleges, which were also competitively selected. During each round, the community colleges developed action plans, received advice through site visits by mentors, attended national conferences, and conducted dissemination activities. A *Monograph of Case Studies* was developed for each round (Eisenberg & Risley, 2003, 2005). Finally, a Best Practices Conference was held in 2005 to recognize seven exemplary community college teacher education programs selected through another national competition. Although the specific goal of the project was to strengthen the science, mathematics, and technology components of the preservice teacher education programs in the community colleges, the project also exposed participants to exemplary approaches to student recruitment, retention, and advisement; field work; leadership development of future teachers; articulation strategies at the local, state, and national levels; and overall curriculum development at both the course and degree levels.

Each community college in Rounds I and II was expected to create a four-member team that included a community college administrator with budgetary oversight and responsibility for the science curriculum, the mathematics curriculum, or both; two faculty members from science, mathematics, education, or technology who work with preservice teachers; and one 4-year college or university faculty member who works with future teachers. A two-member mentoring team composed of one experienced teacher educator from a community college and one experienced teacher educator from a 4-year institution was matched with a specific community college based on the community college's goals or needs, as outlined in the application. Each mentor team was assigned two or three community college teams to work with throughout the project.

### **Role of Mentors**

The mentoring team worked directly with the community college team as it developed an action plan with specific goals, timelines, and responsibilities. This action plan guided the team's work throughout the project period. Additionally, each mentor team served as a resource and as a visible advocate for the importance of education in science, mathematics, and technology for future teachers. During their site visits to the community colleges, the mentors met with the community college presidents to advocate for the program and gave presentations to the faculty about the NSF-PTK project and its goals. In many cases, the mentors attended mathematics, science, and teacher education classes. The mentors also met with students and with

student support services personnel to brainstorm about ways to enhance the college's teacher education program.

### **Activities and Accomplishments**

Community colleges in the project had very different goals, all related to their teacher education program. The NSF-PTK grant recipients experienced several commendable accomplishments. New connections, stronger curricula, and student support are some of the areas cited by the institutions. A few colleges reported that their participation in the program gave them the leverage needed to secure additional grant monies that supported their teacher education programs.

New links were established and existing links were strengthened within the colleges as well as at the community, state, and national levels. Internal collaboration across and within departments and divisions was strengthened, bringing together teams of administrators, academics, and student support staff whose goal was to produce a strong teacher education program on each campus. Linkages with local school districts, such as high school cadet programs, improved. Articulation with 4-year institutions, spurred on by the inclusion of a 4-year college faculty member on each community college team, was strengthened. In some cases, the junior- and senior-level education courses were offered by many of the 4-year colleges on the community college campuses. Also cited was leadership involvement in state and national teacher education organizations by some of the community college faculty members.

Curriculum innovations grew. All institutions developed new curricula or revised existing science and mathematics courses for preservice teachers. Curriculum activities reported by community colleges included such efforts as the development of a science course sequence specifically for elementary education majors, the linking of biology and algebra courses into a learning community for teacher education students, and the creation of a new biology and physics course for elementary education majors. Additional curriculum development involved the inclusion of technology and hands-on applications in science and mathematics courses for future teachers, the development of service learning opportunities for teacher education students, and the linking of the community college teacher education courses with those offered by the partner 4-year institution. Often, more clarification and synchronization of curriculum development took place because of the time created for in-depth planning and communication.

### Additional accomplishments included the following:

- Special future teacher opportunities were developed or expanded. Colleges improved recruitment efforts for the education programs, developed special programs for preservice teachers (such as future teachers clubs), established teacher preparation centers on campus, and facilitated student visits to transfer institutions as well as to future teachers conferences.
- Colleges strengthened the infrastructure of their teacher education programs through such activities as the hiring of new full-time education faculty members, the initiation of identification and tracking systems for students who self-identify as future teachers, the establishment of on- and off-campus teacher education advisory boards, and the development of the associate of arts in teaching degree or the associate in science in elementary education degree.
- Recruitment and retention efforts were undertaken. These efforts included the creation of teacher education organizations for high school students who might be interested in teaching as a career; the development of new brochures, Web sites, and transfer guides to attract students to teaching and to facilitate their completion of the bachelor's degree; the initiation of future teachers conferences; and the development of stronger relationships with local school systems, 4-year partner institutions, and the community.

### Award-Winning Colleges

As part of Round II, PTK conducted a national competition in the fall of 2005 to highlight the achievements of community colleges that had best met the needs of those students who will become K-12 teachers of mathematics and science. The emphasis was on the degree to which community colleges nurtured professionalism and provided evidence of the college's effectiveness, from the perspective of students. The winners were honored at the opening ceremony of the March 2006 conference of the National Association of Community College Teacher Education Programs. Case studies of the award-winning colleges and conference recommendations were published in *Best Practices in Teacher Preparation Programs: Focus on Students* (Cunniff, 2006). Table 1 provides an overview of the seven award-winning colleges.

Although the seven award-winning colleges had widely different enrollments and service districts, several common programmatic characteristics were evident. These included (a) strong administrative support; (b) exemplary faculty leadership; (c) a strong curriculum—often developed jointly with their 4-year college partner, thus ensuring smooth articulation;

**Table 1**  
**Phi Theta Kappa Award-Winning Colleges**

Community College	Number of Campuses	Fall 2005 Enrollment	Number of Fall 2005 Education Program Students	Does the 4-Year Partner Institution Teach on Campus?
Henry Ford Community College, MI	Main campus	12,521	500	No University of Dearborn is nearby
Jackson Community College, MI	Main campus plus two additional centers	4,920	> 300	Yes Spring Arbor University Eastern Michigan University
Lansing Community College, MI	Main campus plus three satellite learning centers	20,000	850	Yes Central Michigan University
Navarro College, TX	Three campuses	6,000	468	Yes Texas A&M University-Commerce
Normandale Community College, MN	Main campus	8,242	120	Yes Minnesota State University-Mankato
North Iowa Area Community College, IA	Main campus plus community education centers at five area towns	3,136	139	Yes Buena Vista University
Pellissippi State Technical Community College, TN	Four campuses	7,686	471	Yes Tennessee Technological University

(d) strong student support programs and multiple opportunities for students to participate in leadership development; (e) service learning; and (f) professional activities.

### Strong Administrative Support

At the award-winning colleges, administrative support for the teacher education program increased. Several colleges noted that additional fiscal resources had been provided to expand campus space with designated teacher education program resource rooms; enhance academic resources

such as software, manipulatives, and library holdings; provide release time for education program directors; and hire new faculty members. Campuswide support for teacher education program events, such as future teachers conferences, was also provided. Others noted that financial support had been provided for teacher education students and faculty members to attend professional conferences. Still others reported that their institutions had committed the resources needed to seek grant funds to enhance and expand teacher education programs.

The colleges also spoke positively about the marketing support they received to develop press releases and promotional pieces for print media, local radio, and television; and others commented on the visible presence of the 4-year partner institution on the community college campus and the development of multiple articulation agreements with 4-year institutions for education students. The teacher education programs at the colleges gained additional recognition and visibility through the efforts of senior administrators to promote—both on and off campus—the institution’s teacher education offerings, recognize teacher education program goals and achievements during on-campus discussions and events, make programmatic presentations before boards of trustees, and participate on internal and external teacher education advisory boards. Some of the institutions also noted that teacher education was established as a college strategic initiative and that faculty members from the various disciplines were encouraged by the administration to teach education-focused classes in their academic fields.

### **Exemplary Faculty Leadership**

Strong faculty leadership was evident in all seven teacher education programs recognized by PTK. Faculty program directors were well connected on their campuses and in the teacher education community. For example, several of the faculty program directors in these seven award-winning colleges held leadership positions in state and national teacher education associations. These connections enabled them to bring in a broad faculty team to teach in the education program and to serve on advisory boards.

The strong faculty leadership resulted in extensive team building. For example, at Henry Ford Community College, 26 faculty members had taught in the teacher education program in the three semesters prior to the college’s receipt of the PTK award. These faculty members, along with the college’s vice president and other representatives from the campus

community, served on the Henry Ford Community College Pre-Education Advisory Committee that meets monthly. At North Iowa Area Community College, a much smaller rural institution, 17 mathematics faculty members taught the mathematics courses in the teacher education program, and 12 science faculty members have shared the science-teaching load.

### **Strong Curriculum**

All seven award-winning colleges worked with the faculty teams to develop their curricula. Many developed courses jointly with their 4-year partner institution, thus ensuring smooth articulation. All courses were developed to meet state and national standards. All seven programs infused fieldwork early in their programs with the desire to expose preservice students to diverse classroom situations, different classroom management tools, and various teaching styles.

At Lansing Community College, for example, each science course had a capstone event directly tied to educational outcomes. Some capstone projects were research oriented; others dealt with work within a local elementary classroom. One project involved planning, leading, and evaluating a field trip for elementary students.

Normandale Community College developed a Technology for Teaching course that exposes preservice students to methods for integrating technology into K-8 classrooms. Activities include working with visual-based products such as PowerPoint, developing concept maps with computer technology, developing Web pages, and completing multimedia-based projects with HyperStudio. All students in this class assembled their work into an electronic portfolio that includes their reflections on the implications of using educational technology from both a learner's and a teacher's perspective.

### **Strong Student Support Programs**

Students from the seven award-winning colleges spoke highly of the advisement they received. Often, the teacher education program had its own adviser. Transfer guides had been developed for each articulation option. Each of the seven award-winning colleges had excellent communication mechanisms to keep students informed and involved. In addition to the transfer guides mentioned above, these included program Web pages, program newsletters, and e-mail listservs. Some colleges often brought in



speakers from the senior partner institutions to speak with their students; other colleges took their students on field trips to the senior institutions.

Scholarships specifically designated for teacher education students were widely available. Jackson Community College's foundation has 5 scholarships specifically targeted to teacher education students. At Henry Ford Community College, 10 scholarships are designated for teacher education students, and at Pellissippi State Technical Community College, a Future Teachers Scholarship fund has been created through the college's foundation.

In student letters of support, which accompanied the applications for the Best Practices Conference, teacher education students at the award-winning community colleges wrote about the smooth transition that occurred as they moved into junior and senior education courses. The students stated that this smooth transition was due to the positive working relationship between the community college and its 4-year partners. The students also commented on the benefits of having the 4-year partner offering courses on the community college campus. Six of the seven colleges had 4-year partner institutions teaching the junior- and senior-level education courses on their campuses, and the seventh college, Henry Ford Community College, is located very near the neighboring University of Dearborn.

Community colleges are known for their strong community involvement. The seven PTK winners were no exception. Teacher education students at Lansing Community College gave presentations to elementary students at a science museum in Lansing. North Iowa Area Community College teacher education students worked with an after-school book club at a local elementary school in Mason City. Jackson Community College noted that of the 35 newly hired teachers in the Jackson, Michigan, area for 2005, 27 began their education at Jackson Community College. This example highlights the role that community colleges play in helping local school districts "grow their own" teachers.

### **Service Learning**

Service learning was a component of many teacher education courses in these seven award-winning colleges. For example, students at Navarro College often worked in the Navarro Kid's College, a summer program on the Navarro campus for children who are 7 to 10 years of age. Students who work in this program are responsible for formulating lesson plans and teaching classes of approximately ten students for a week on a given topic.

## Professional Activities

Each college attempted to provide students with the opportunity to experience being a teacher education major as early as possible in their college careers. Students were provided with numerous opportunities to interact with practicing teachers in their community, to hone their leadership skills in teacher education clubs, to attend and present at professional conferences and meetings, and to maintain ongoing contact with their local community through service learning (mentioned above) and field experiences. Many of the award-winning colleges hosted Future Teachers Conferences. At Pellissippi State Technical Community College, students organized the Future Teachers Conference, incorporating sessions that range from classroom management issues to effective use of technology in the classroom. Attesting to its strong linkage to the community and the state, Pellissippi State Technical Community College successfully recruited the Commissioner of Education for Tennessee as the keynote speaker for its 2005 Future Teachers Conference. Jackson Community College, along with its partner 4-year institution, Spring Arbor University, and the Jackson County Intermediate School District, involved students in planning Michigan's largest Future Teachers Conference, at which area PreK-12 school professionals participated as well as Michigan's Teacher of the Year. Many of these Future Teacher Conferences were run jointly by students from the community college and students from the 4-year partner institution.

## Follow-Up Survey

To determine the impact of the NSF-PTK project, the authors administered two Web-based surveys in the fall of 2006 to obtain information from the 36 community colleges and their 4-year college or university partners. One survey was designed for the community colleges, the other for the 4-year partners. Both surveys asked about certain institutional characteristics such as location (rural, suburban, or urban) and enrollment, programmatic characteristics such as teacher education enrollments and the number of faculty members (full- and part-time), and the success rate of students on PRAXIS I or similar examinations. Additionally, the community colleges were asked if they award an associate's degree in teaching or a bachelor's degree in education and the percentage of students transferring to 4-year institutions to complete the baccalaureate degree.

These surveys employed a descriptive design in that they did not attempt to attribute causality. Rather, the intent was to describe the current status of these grant-funded teacher education programs and elicit perceptions of their impact. The descriptive information obtained through the surveys is of interest to the participating institutions, the National Science Foundation, and other community colleges. However, because there are no baseline data against which the current profile of participating institutions can be compared, the following paragraphs will report only the participants' reflections about the impact that the NSF-PTK project had on their teacher education programs and the overall health of the community college's teacher education program at the end of the project.

Before doing so, it is important to note the difficulties encountered in obtaining follow-up information about the project. At the time of the survey, the partnerships from Round I of the NSF-PTK project were 5 years old. Many of the individuals who had held leadership positions during this period had moved into other positions or had left their institutions. Through an extensive effort to locate individuals who had been part of the original PTK teams, we were ultimately successful in identifying an appropriate respondent from each of the 36 participating community colleges. However, the search for respondents from the partner 4-year institutions was more difficult. In many of the Round I partnerships, the community colleges had sought to develop sequences in mathematics or science for their teacher education students. As a consequence, some community colleges linked with mathematics or science faculty members at participating 4-year institutions. But these faculty members, if still employed at the 4-year institutions, were often unable by the fall of 2006 to provide data on current partnership activities or insights into the overall strength of the teacher education program in the community college. We were then referred to the teacher education departments at the 4-year institutions and to individuals who often had little, if any, interaction with the original project. Nonetheless, we eventually did find a representative in 29 of the 33 4-year partner institutions. One 4-year institution partnered with two of the community colleges, one community college team had a linkage to a school district rather than to a 4-year institution, and one 4-year institution never developed the linkage that had been stated in the original application.

Ultimately, 27 community colleges and 14 4-year institutions responded to their respective surveys. Results indicate that 20 of the 27 community colleges offered an associate's degree in teaching. None of the 27 community colleges awarded a bachelor's degree in education, and only one of the

community colleges in the NSF-PTK project indicated that it was reviewing whether to award such a degree.

### **Perceptions of Project Impact**

The community colleges were asked to characterize the impact of the NSF-PTK project on the college's teacher education program. Of the 27 respondents, 25 indicated that it had either a positive or significantly positive impact on their teacher education program. The additional comments were very positive. When the partnering 4-year colleges were asked about the impact of the project on their programs, 7 of the 14 responding institutions indicated that the PTK grant had a positive impact on the overall number of students in their teacher education programs.

The community college respondents also noted that the PTK grant had provided them with the opportunity to learn about state and national trends, to develop a strong network, to strengthen their linkages with the 4-year partner institutions, and to garner additional support from their administration. Some specific comments included the following:

The grant was the kick start for many wonderful endeavors and provided the leadership and recognition to solidify the teacher education program. It also provided us with state and national connections to improve and develop our program further. The recognition gave the local high school and nontraditional students greater respect for the program.

Participation [in the grant] was a catalyst for significant start-up and development of our program. The information, mentoring, and linkages were extremely helpful.

The PTK grant helped us begin work on two NSF grants. We focus on recruiting underrepresented populations into teaching as well as the preparation of math and science teachers.

The PTK grant gave us the jump start we needed. It gave us time and ideas to formulate a plan, encouragement and support needed to implement the plan. Our plan was later expanded into a statewide grant.

Others noted that the PTK grant had helped them acquire additional resources. For example, one person commented as follows:

Participation in the PTK grant has become the cornerstone of their program. From this, we received other technology grants to support our efforts. The college administration also rallied by creating an Academy of Teacher Preparation Programs to help support local, state, and national efforts in teacher education.

The community colleges were also asked whether the partnership with a 4-year institution, mandated under the PTK grant, had any positive impact on overall articulation opportunities for students in the college. Although 8 college respondents indicated that they were unable to answer this question, 15 of the 27 colleges responded that the partnership through the PTK grant had a positive impact on overall articulation for students. One respondent noted, "For the first time our students are able to complete a teaching degree with our 4-year partner on our campus."

More than half of the community college respondents (14) reported that their 4-year partner institutions were teaching the junior and senior program in teacher education on their campuses. Some of these arrangements existed prior to the NSF-PTK project. But 6 of the community college respondents indicated that their partner 4-year institution began teaching junior- and senior-level education courses on the community college campus as a result of the project.

### **Health of the Community College Teacher Education Programs**

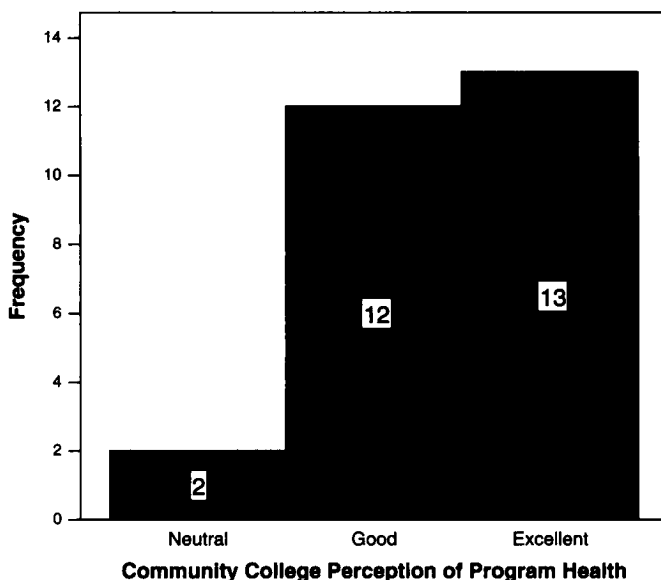
In both surveys, the respondents were asked to evaluate the overall health of the community college teacher education programs. The community college respondents were asked to characterize the health of their preservice teacher education programs and each 4-year partner institution was asked to characterize the health of the teacher education program at its partner community college. The results are shown in Figures 1 and 2.

Several community college respondents who rated the health of their program as excellent noted that "enrollments continue to grow and more faculty [members] are being trained to teach discipline teacher-focused classes," and "we now have two highly qualified full-time faculty, strong enrollments particularly in response to our new AAT [associate of arts in teaching] degree, and improved partnerships with 4-year schools." Another community college respondent noted that "we have added new programs such as teacher in-service and an alternative certification in the last year."

Among the comments from the representatives of 4-year institutions was the observation that "on PRAXIS II, our program completers at the 2 + 2 sites outperform those who have completed our program on the home



**Figure 1**  
**How Survey Respondents From the Community Colleges Participating in the National Science Foundation–Phi Theta Kappa Grant Program Perceived the Health of Their Preservice Teacher Education Programs**

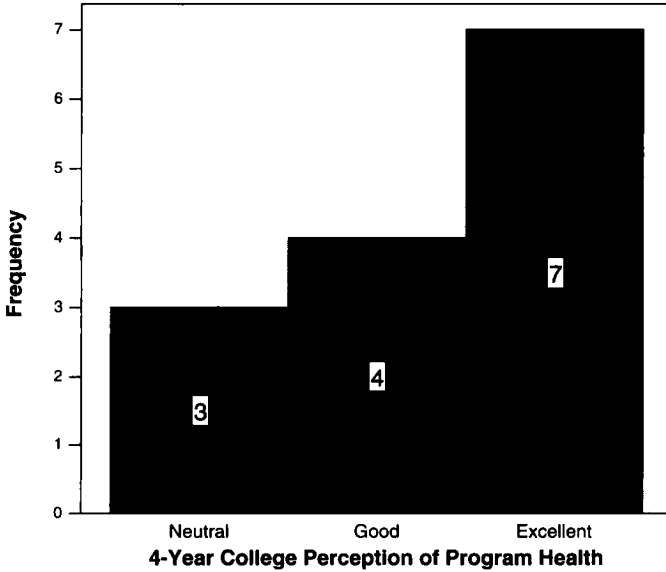


campus.” Another 4-year college partner noted that “we have only been at our location (on the community college campus) for 5 years. We have grown from 12 to 550 students with 90% of our students being education majors.” Yet another respondent noted that “our community college transfer students complete our program at a similar rate as our native students.”

### Conclusion

The NSF-PTK project provided knowledge, support, and a network for faculty members and administrators in the area of teacher education. The project served as a catalyst for program development and improvement in many of the 36 community colleges involved. Some of these colleges then served as a catalyst within their respective states for the formation of associate of arts in teaching degrees and additional formal articulation partnerships.

**Figure 2**  
**How Survey Respondents From Partnering 4-Year Colleges Perceived the Health of the Preservice Teacher Education Programs at the Community Colleges With Which They Worked**



Some of the community colleges in the project had teacher education programs already under way when the grant began. These community colleges used the grant to strengthen their programs. Other community colleges in the grant, approximately half of the colleges involved, were just beginning and relied heavily on the project to provide a pathway for program development. The perceived overall impact on the teacher education programs in the 36 participating community colleges included improved curriculum development, the initiation and strengthening of a professional network, the acquisition of additional human and fiscal resources, improved enrollments, better articulation with 4-year partner institutions, and greater recognition for preservice teacher education programs in the community colleges. The 4-year college partners used the project to increase their enrollments, collaborate on curriculum development, and benchmark the success rates of their native students against those who had come through the community college transfer process.

In addition, the NSF-PTK grant has opened the door for further research opportunities. Future research might focus on improved data analysis of community college teacher education students relative to transfer, graduation, entrance, and retention in the teaching profession; the direct and indirect impact of partnerships and collaboration in recruiting teachers; and the graduation and teacher retention rates for community college teacher education transfers who complete their baccalaureate degrees on the community college campus.

If a grant program connected to mathematics and science teacher education at community colleges can yield such positive benefits for future teachers and participating institutions alike as the NSF-PTK project did, it would be reasonable to conclude that future funding and research may also strengthen our capacity to address other issues and topics in teacher education. If community colleges are creating a strong niche to support the development of future teachers, bringing a higher level of collaboration, communication, and unity in teacher education program development throughout all levels in higher education, it may benefit researchers to investigate how the action plan process used in the NSF-PTK grant creates new meanings in teacher education program development. For example, research notes that teacher attrition is unquestionably an issue. Teachers learn different things from diverse teaching experiences (Kennedy, 1999). New pedagogical approaches are needed and can enhance the teaching and learning of preservice teachers (Banks et al., 2005). Further data, based on a collaborative action plan for developing future teachers, may affect and strengthen many facets of all teacher education program development including recruitment, transfer, graduation, and retention. Innovation and change are characteristics of this century. Community colleges and 4-year institutions through collaboration, as described through this grant process, can affect, strengthen, and change the teacher professional pathway in the 21st century.

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