# Characteristics of Effective Alternative Teacher Certification Programs

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***Background:*** *Alternative certification plays a central role in the production of new teachers in many states, yet little is known about the characteristics of an effective program. Given that the variation within programs is as great as the variation between programs, the common methodology of comparing programs is unable to discern the qualities of programs with positive teacher outcomes.*

***Focus of Study:*** *This paper is based on an analysis of seven alternative certification programs to determine the characteristics of effective programs. It presents findings from an analysis designed to shed light on the effects of personal, program, and contextual inputs on teaching outcomes. To account for within-program variation, the analysis clusters individuals across programs based on common background characteristics, program experiences, and school contexts.*

***Research Design:*** *We employed multiple data collection activities at both the program and participant levels. We conducted case studies of seven alternative certification programs, including multiple interviews with key personnel and document reviews. We surveyed program participants twice—once at the beginning of their participation in the program, and again at the end of their first year of teaching. We also observed a sample of participants teaching and interviewed them both at the beginning and end of their first year of teaching.*

***Findings:*** *We found that each program, personal, or contextual element analyzed impacted*

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*various outcomes differently, and each contributed to the development of skilled, confident teachers. The element with the strongest effect on all measured outcomes, however, was school context.*

***Conclusions :*** *Overall, findings suggest that an effective alternative certification program places candidates in schools with strong leadership, a collegial atmosphere, and adequate materials. Effective programs select well-educated individuals or work to strengthen subject-matter knowledge, and recognize that previous classroom experience is an asset. Effective programs provide carefully constructed and timely coursework tailored to candidates' backgrounds and school contexts. And, effective programs provide trained mentors who have the time and resources to plan lessons with candidates, share curricula, demonstrate lessons, and provide feedback after frequent classroom observations.*

## INTRODUCTION

Alternative teacher certification has become an increasingly common part of the teacher-preparation system. First established in the 1980s as a response to projected teacher shortages, alternative certification programs are found now in nearly every state and many colleges and universities (Feistritzer, 2005). More recently, school districts have begun their own teacher-preparation programs, often in partnership with local universities. In some parts of the country, nearly as many teachers enter the profession through alternative routes as traditional routes (Humphrey & Wechsler, 2005).

Typically, alternative certification programs offer qualified teacher candidates a streamlined preparation program that places them in the classroom as the teacher of record more quickly than traditional university-based programs. While this is generally true, some programs considered to be alternative actually require a longer combination of coursework and internship than most university programs. Furthermore, while traditional programs are generally structured around coursework and a culminating student teaching experience, many university programs are increasingly integrating coursework and student teaching. This blurring of the lines between alternative and traditional routes seems likely to increase.

Despite the overlap between traditional and alternative teacher preparation, alternative certification has recently become the U.S. Department of Education's favored policy response to the dual demands of improving teacher quality and increasing the teacher supply. The U.S. Secretary of Education's *Third Annual Report on Teacher Quality* (U.S. Department of Education, 2004) promotes alternative certification, and the federal No Child Left Behind Act includes participants in alternative

certification programs in its definition of "highly qualified" teachers. At the same time, opponents of alternative certification have been sharply critical of such endorsements, charging that alternative certification places unqualified teachers in the classrooms of the neediest students.

Ironically, both the endorsement and criticism of alternative certification are based on a very thin research base. The initial findings of this study demonstrated that many of the assumptions about alternative certification put forth by both proponents and opponents are inaccurate (Humphrey & Wechsler, 2005).[1] Rather than declaring alternative certification a wholly good or bad enterprise (as proponents and opponents, respectively, tend to do), we concluded that teacher development in alternative certification appears to be a function of the interaction between the program as implemented, the school context in which the on-the-job training occurs, and the career trajectory of the individual participant. Our analysis highlighted the importance of variations both across and within programs, and led us to question the usefulness of making comparisons between different alternative certification programs. Rather, we theorized, a better unit of analysis would be a subgroup of individuals from different programs with similar backgrounds and experience, who work in similar school settings.

The analysis presented in this paper builds on these conclusions to address the research question: What are the characteristics of effective alternative certification programs? This paper is an attempt to add to the knowledge base on alternative certification to inform policy-makers and program directors seeking to address concerns about teacher supply and teacher quality.[2]

After providing a brief overview of the methodology, we examine the characteristics of alternative certification participants and program components and identify variables that seem likely to contribute to program outcomes. Next, we describe the contributions of the identified variables to a variety of outcome measures. We conclude by discussing the relevance of the findings to the improvement of alternative certification in particular, and to teacher preparation in general.

## STUDY METHODS

We employed multiple data collection activities, focusing on seven alternative certification programs. To ensure that the programs we studied met certain practical and theoretical criteria, we used a purposive sampling strategy that considered program scale, replicability, intensity of support, and participant characteristics. The seven programs are the Teacher Education Institute in the Elk Grove, California, Unified School

District; New Jersey's Provisional Teacher Program; Milwaukee's Metropolitan Multicultural Teacher Education Program (MMTEP); the New York City Teaching Fellows Program; North Carolina's NC TEACH (North Carolina Teachers of Excellence for All Children); Teach For America; and the Texas Region XIII Education Service Center's Educator Certification Program.

In six of the seven programs, participants are full-time teachers while completing their credential requirements. Elk Grove's Teacher Education Institute, which requires a full year of student teaching in concert with coursework, is the exception. The programs vary in size and the targeted participant population. Milwaukee's MMTEP program is considerably small, serving only 20 participants, all of whom have been paraprofessionals or teacher's aides in Milwaukee for at least one year. In contrast, the New York City Teaching Fellows Program prepares several thousand teachers annually, all of whom have strong academic and/or professional backgrounds. NC TEACH was designed to support mid-career professionals interested in switching to a career in education. New Jersey's Provisional Teacher Program trains teachers already hired to work as the teacher-of-record in schools. Teach For America recruits new college graduates from selective universities to serve as teachers in hard-to-staff urban and rural districts. The Texas Region XIII Educator Certification Program targets both mid-career professional and recent college graduates in high-need subject areas. All seven programs provide coursework, though the focus and amount of coursework varies, as does the developer and provider of the coursework. All seven programs also offer some type of mentoring, though the source and focus of mentoring varies. The one characteristic common to all programs is that they are considered to be alternative, rather than traditional, teacher-preparation programs. Brief descriptions of each program's design can be found in Appendix A.

For each program, we conducted interviews with key personnel three times over the course of the study (spring 2003, fall 2003, spring 2004). Respondents included the program director, teaching faculty, certification advisors, classroom supervisors, and others. We also collected and examined program documents, including program descriptions, course syllabi, existing evaluations or evidence of effectiveness, and other documents.

We collected participant-level data over the course of the 2003–04 academic year. For each program, we surveyed participants at the beginning and end of their first year in the program, which, in six of the seven programs, was also the beginning and end of participants' first year as full-time teachers.[3] The survey included questions about participants' background (e.g., past professional experiences, college majors, demo-

graphics); perceptions of preparedness for teaching; reasons for going into teaching; and reasons for choosing the alternative certification program. The questionnaire also measured participants' knowledge for teaching reading and mathematics, program supports received, career plans, and perceptions of growth.

In each program, we followed 10–13 participants as they progressed through the first year of their program. We used a two-phase sampling strategy to select target participants. First, we randomly selected schools in which the alternative certification teachers were working. Then, in schools with more than three participants, we randomly selected participants. We observed each participant in the classroom twice—once in the fall and again in the spring—using a structured observation instrument to measure the classroom learning environment, the teacher's pedagogical strategies, and classroom management. We also conducted in-depth interviews with each participant that consisted of three parts: (1) a reflection on the observed lesson (i.e., perception of its strengths and weaknesses, connections between instructional strategies and the alternative certification program); (2) information on the participant and his/her experiences in the program (i.e., background, program components, perceptions of the program, school context, other professional development experiences, perceptions of readiness to teach); and (3) a case scenario designed to assess knowledge, attitudes, and beliefs about teaching. This strategy entailed presenting the participant with a realistic classroom-based scenario and asking how he/she would respond to the situation and the reasons for doing so. The case scenarios helped ground each interview in a consistent set of teaching problems. We also conducted interviews with other individuals influential to the participant's development as a teacher, including the principal and coaches or mentors who worked closely with the participant.

In the following sections, we present our findings. We first summarize results from the initial analyses, describing program participants. We then turn to the programs themselves and the training they provide.

## CHARACTERISTICS OF ALTERNATIVE CERTIFICATION PARTICIPANTS

Our preliminary findings highlighted the importance of interactions between the program as implemented, the school context, and individuals' backgrounds (Humphrey & Wechsler, 2005). In this section, we review key findings from our earlier paper and present additional data about alternative certification participants.

*The demographics of alternative certification participants*

Alternative certification programs sometimes are designed to diversify the pool of new teachers. On average, alternative certification teachers in our sample are not very different demographically from traditional route teachers, though a closer look at participants' characteristics reveals some interesting patterns. While the mean age of participants is slightly higher than teachers in traditional preparation programs, the age range within programs is considerably wide, with alternative certification teachers representing both older individuals as well as new college graduates. Further, national data and data from the seven case study programs indicate no considerable gender differences between alternative certification and traditional preparation participants. Some individual programs, however, attract greater percentages of men to the teaching profession than national averages. In addition, while overall averages suggest that alternative certification programs are successful in attracting greater percentages of minorities into the teaching profession, program participants tend to reflect the racial composition of their local teacher labor market (Humphrey & Wechsler, 2005).

*Selecting alternative certification participants*

Much has been made of alternative certification programs' ability to attract talented and well-educated individuals into teaching. Indeed, most programs devote considerable resources to the selection of participants. However, research on the personal characteristics and backgrounds of individuals who will become effective teachers is thin (Wilson, Floden, & Ferrini-Mundy, 2001). As a result, different programs have different selection criteria, depending on their assumptions about the most desirable qualities. Teach For America, for example, selects well-educated young people from many of the nation's most prestigious universities. The New York City Teaching Fellows program also looks for well-educated individuals, but is also interested in candidates with significant career experience. In contrast, Milwaukee's MMTEP program only selects teacher's aides already working in the Milwaukee Public Schools. New Jersey's selection process includes a minimum grade point average and the demonstration of subject-matter knowledge, but is highly decentralized, as candidates must have a job offer as a requirement for admission. Given the large number of New Jersey candidates with previous classroom experience (discussed later), it seems that the hiring principals and district officials value such experience.

While there may be a variety of personal characteristics that make for an effective teacher, most alternative certification programs bet on education background, work experience, previous classroom experience, or some combination of the three.

*Education backgrounds*

Research suggests that teachers with strong academic backgrounds may be more effective than less well-educated teachers (Ballou & Podgursky, 1997; Wayne & Youngs, 2003). The case-study programs included individuals with a variety of educational backgrounds. We used Barron's six-scale selectivity ranking for undergraduate universities and coded participants as having attended a competitive or a less competitive institution of higher education (Barron's Educational Services, Inc., 2002). We included Barron's two highest rankings in our "competitive" category, and two lowest rankings in our "less competitive" category.[4] Although alternative route teachers overall are more likely to have graduated from competitive universities than from less competitive ones, we found wide variation. The percentage of alternative certification participants attending a competitive college ranges from 58 percent of TFA participants to none of MMTEP's participants. Of course, the competitiveness of the college or university that an individual attended is just one indicator of a well-educated individual. Further, programs like MMTEP argue that their recruiting strategy results in new teachers who are committed to their communities and less likely to move on after a few years.

*Previous career and classroom experience*

Alternative certification programs are often considered an effective means for attracting career-changers, allowing business people, scientists, mathematicians, lawyers, architects, engineers, and other skilled professionals to bring their experience and acumen to the teaching profession. Although we did encounter some career-changers, more participants had been full-time students or employed in an education-related field immediately before entering the program. Overall, relatively few participants switched from careers in mathematics and science to teaching (about 5%), only 2 percent came from the legal profession, and 6 percent came from a financial or accounting career. In contrast, about 42 percent of participants were either in education or were full-time students immediately before entering their alternative certification program. Accordingly, when we examined the financial changes that participants made to enter

the teaching profession, we found that the majority of participants in the seven programs experienced a salary increase (Humphrey & Wechsler, 2005).

Perhaps most instructive to understanding alternative certification participants, nearly half of participants had classroom experience prior to entering their program. In five of the seven programs, more than 60 percent of participants report having previous experience as a classroom teacher, substitute teacher, or teacher's aide. And, their experience was of considerable length. For example, New Jersey participants who had previous teaching experience averaged 39 months of experience.[5] Similarly, 41 percent of participants across all seven programs had at least a full academic year of classroom experience.

The large number of participants with classroom experience led us to include this variable in our outcomes analysis (reported later). We also wanted to analyze the impact of previous careers, especially in mathematics and science; however, there were insufficient numbers of candidates with these previous career experiences to conduct the analysis.

These demographic and background variables provide just a small glimpse into alternative certification participants. Although we only describe a few variables here, they adequately demonstrate the complexities of thinking about effective alternative certification programs. Though we can make statements about alternative certification participants as a whole, means mask important variation both across and within programs. The variation matters not just as a statistical exercise, but because personal characteristics influence the supports individuals need to develop into professional teachers. Within most of the programs, participants' education, experience, and commitment vary greatly. And, as a result of the variation, participants have very different developmental needs. This basic fact complicates any attempt to identify a fixed set of program characteristics that can guarantee the successful production of effective teachers. Clarifying who participates in alternative certification programs in a more detailed manner—both across and within programs—thus, is important in determining the characteristics of effective programs.

## ALTERNATIVE CERTIFICATION PROGRAM COMPONENTS

The complexity of alternative certification is due not only to the variation of participant backgrounds, but also to the variation in how participants experience their programs and school placements:

> Program components espoused by program directors, course catalogs, or other media provide a general sense of the goals of, and the ideal training offered by, a program, but in practice may not accurately reflect the learning opportunities participants experience. Both the participant's characteristics and the school context may undermine even the best designed program features. Individuals learn from both the formal and the informal contexts of their schools. In most programs, this learning exists beyond the control of the alternative certification program. (Humphrey & Wechsler, 2005, p.29)

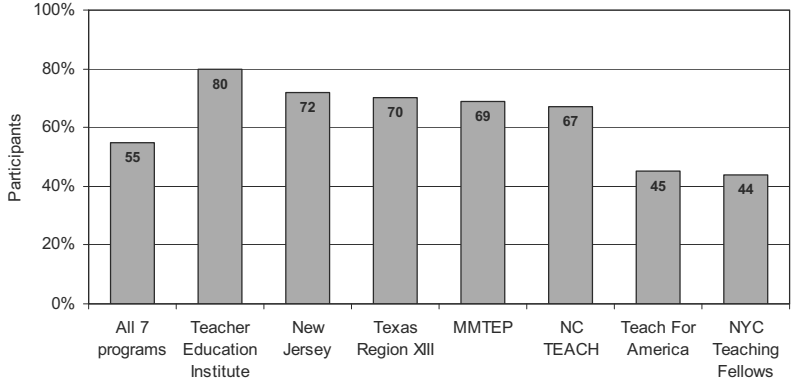
Next, we elaborate on this notion by examining how participants experienced their coursework, mentoring and supervision, and school environments. Importantly, we document the variation of participant experiences within programs.

*Participant experiences with coursework*

Coursework is a key training component in each of the seven case study programs. Across programs, program directors reported that the coursework provided practical training focused on specific skills and knowledge that teachers need in classrooms. In fact, the coursework varied in the emphasis placed on subject-matter content, pedagogy, classroom management, educational theory, and child development. These variations exist not only among different programs, but within individual programs as well, depending on who designs the course curricula (Humphrey & Wechsler, 2005). Some alternative certification programs design their own curricula; others are designed by partner universities. In the New York City Teaching Fellows program, multiple university partners design and deliver coursework, and thus participants within the one program may have very different experiences with their coursework.

In general, participants reported that coursework mattered to their development as teachers, though ratings varied by program. Across programs, 55 percent of participants reported that their coursework during the school year was a moderate to very important source of professional support (see Exhibit 1). At the extremes, over four-fifths of Elk Grove's TEI participants but less than one-half of New York City Teaching Fellows rated their coursework highly.

**Exhibit 1. Percent of Participants Reporting that their Coursework Was a Moderate to Very Important Source of Professional Support*****




***p < .001.
Source: SRI Survey of Alternative Certification Program Participants (2004).

Across all programs, alternative certification participants spoke most highly about practical courses focused on specific ideas for teaching a curriculum or handling classroom management. Faced with a classroom of students each morning, participants were eager to learn specific strategies to employ immediately in their classes. One participant, for example, extolled the applied nature of her classes: "It is all practical. They are always asking us what is useful or not." Participants were much less enthusiastic about theoretical, historical, or foundational classes. Criticizing her more academic classes, another participant said, "The courses haven't provided anything that I can apply in the classroom. It's not tangible."

Alternative certification participants' appraisal of their coursework also seems to depend on their readiness to learn. Some participants, especially those with previous classroom experience, seemed more equipped to learn from their coursework. Those who could connect their coursework to prior understandings reported more benefit from the coursework. One participant, for example, entered her program with a strong foundation in special education and felt very aware of how to manage and relate to children with unique challenges. Through her coursework, then, she was able to identify weaknesses in her knowledge of instructional techniques. "I know the management part of [teaching], . . . I know special ed," she said. "I am learning a lot about the technical part of [teaching] . . . phonemic awareness, phonics."

Participants who do not struggle with the classroom management or procedures also reflected more positively on their coursework. Participants who are not too overwhelmed by their teaching duties, even those with no prior experience, are more likely to report benefits from their credentialing classes. Finding their daily teaching manageable, these participants are more likely to attend their credentialing classes ready to learn and to apply the new knowledge to their classrooms the next day.

Thus, even in the same program, the coursework that is valuable to participants varies, depending on their readiness to learn and their classroom experiences. The variation evident in participants' valuation of their coursework was also evident for other program components, such as mentoring and supervision.

*Mentoring and supervision*

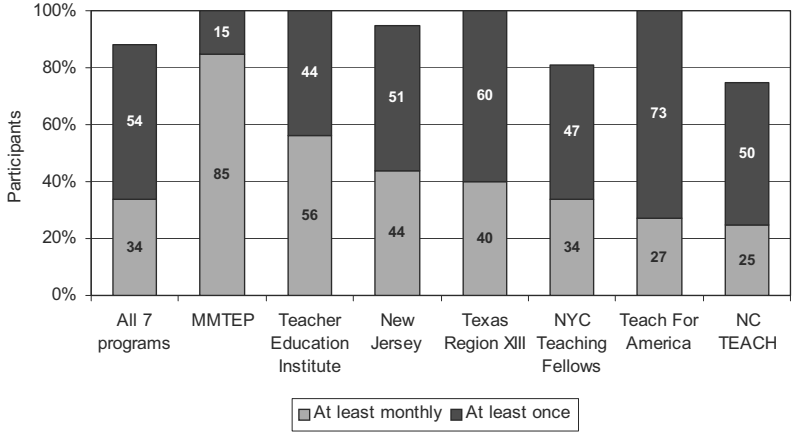
With a heavy emphasis on on-the-job training, most alternative certification programs attach great importance to mentoring. Although by no means conclusive, the research on mentoring suggests that it can be an effective strategy to reduce teacher attrition and improve teacher quality (Lopez, Lash, Schaffner, Shields, & Wagner, 2004). Alternative certification programs provide two types of mentoring and supervision for participants: a mentor or supervisor from the university or alternative certification program and a school-based mentor.

*Program supervision*

One source of supervision and feedback comes from program staff or university supervisors. We found a good deal of variation from one program to another with regard to the frequency with which participants were observed by their programs (see Exhibit 2) and the value the participants placed on it. Nearly all participants in five of the seven programs reported receiving such support at least once or more during the school year. However, one-quarter of participants in NC TEACH and one-fifth of participants in the NYC Teaching Fellows Program reported never being observed by program staff or university supervisors. Milwaukee's program stands out for the high frequency of observations and feedback by program staff: 85 percent of participants received feedback from their program at least monthly. Supervision is a key component of the Milwaukee program and one feature that participants across programs value a great deal. Overall, over 80 percent of participants in all programs

who were observed and received feedback from their program staff or university supervisor found that support to be somewhat or very valuable.

**Exhibit 2. Frequency of Observations and Feedback From Program Staff and University Supervisors*****




***p < .001.
Source: SRI Survey of Alternative Certification Program Participants (2004).

*In-school mentoring*

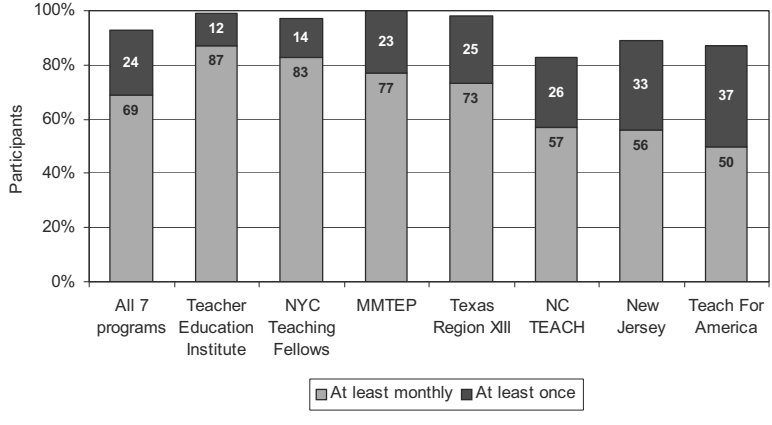
The second type of mentoring is from an in-school mentor. All seven of the programs consider in-school mentoring a prominent feature of their program design, although they used mentors in different ways. Arguably, the in-school mentor can provide the most intensive and valuable support to an alternative certification participant. Informal daily support and regular formal guidance can help a new teacher weather the many challenges of a difficult job. Ideally, the in-school mentor is an accomplished teacher working in the same grade or subject area who has the expertise to help guide and support a new teacher.

In MMTEP, mentors are full-time release teachers, not housed at a specific school site, whose full-time job is mentoring four or five teachers. Elk Grove's TEI employs an apprenticeship model whereby participants are placed in the classroom with a different teacher each semester of the program. The other programs supported mentors who were full-time teachers in the participants' schools.

The percent of participants who received mentor support at least monthly varied by program (see Exhibit 3). The three programs in which

the lowest percent of participants received monthly in-school mentoring also had the highest percent of participants who reported receiving no mentoring support, even though mentoring is a formal component of their programs. Specifically, 17 percent of NC Teach participants, 13 percent of Teach For America participants, and 11 percent of New Jersey participants reported never receiving mentor support. Overall, however, most participants reported a fairly high frequency of mentoring.

**Exhibit 3. Frequency of Observations and Feedback from In-School Mentors*****

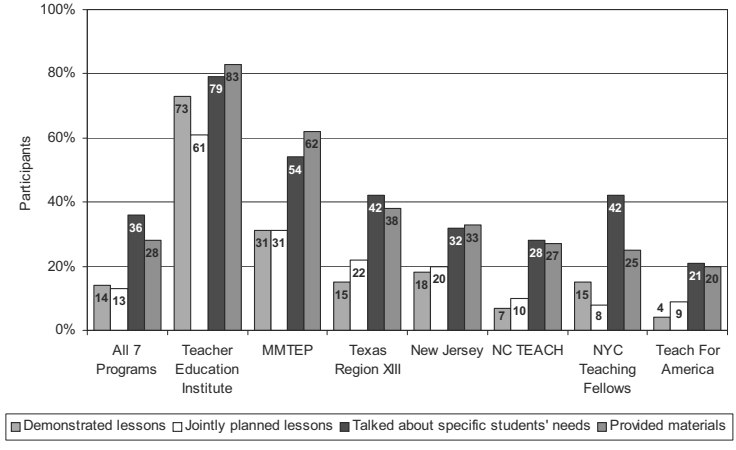



***p < .001.
Source: SRI Survey of Alternative Certification Program Participants (2004).

Mentor support can take many forms, and, according to participants, not all mentoring activities are of equal value. Participants who received mentoring reported that the mentor activities they most valued were watching demonstration lessons, collaboratively planning lessons, talking about the strengths and needs of specific students, and receiving curriculum materials.

We found a great deal of variation by program with regard to the percent of teachers receiving the most valued mentor activities at least monthly (see Exhibit 4). Elk Grove's TEI is the most consistent in providing participants with their most valued types of mentoring. MMTEP is likewise strong, especially in providing materials and talking about specific students. Other programs, however, do not consistently provide any of the most valued types of mentoring.

**Exhibit 4. Percent of Participants Reporting Receiving the Most Valued Mentoring Activities at Least Monthly*****




***p < .001 for all variables.
Source: SRI Survey of Alternative Certification Program Participants (2004).

Through the case studies, we also found that mentors provided very different types of support. Some mentors solely served as a source of emotional support, while others provided a higher level of guidance in learning to teach. Of those mentors who attended to a teacher's practice, we found that many focused primarily on classroom management and procedures rather than instructional technique. One participant, for example, said that her mentor helped her improve in such ways as speaking more quietly in small groups, writing on the board using larger print, and smoothing transitions. Others, however, received specific guidance on how to use curricula, adapt instruction for students, and make creative instructional decisions to meet students' needs. One participant reported:

> [Differentiated instruction] is one thing I've learned from my [mentor]. She'll look at [the lesson], say my kids can't do this. So, she'll bring in the concept another way. Fulfilling the standard, but accomplishing it another way. . . . I've learned to do that through her.

The structure of most programs' mentoring component leaves far too much to chance: availability of the mentor to provide support, knowl-

edge of how to work with adults, and individual teaching style. Most programs do not have a detailed process for selecting mentors, nor do they invest significant time or money into training mentors on what specific activities or supports are most effective in training new teachers. Some programs provide mentor training, but it is rarely focused on a variety of specific mentoring strategies. Further, most programs provide their mentors with only a nominal stipend, and little, if any, release time. For these reasons, quality and content of mentoring varies based on individual teaching style, interest, and personality of the mentor. With a larger investment in recruitment, selection, training, and compensation, programs could potentially remove some of the variability in mentoring.

The program components discussed thus far, coursework, mentoring and supervision, are within the direct purview of the alternative certification programs. Another program component is the on-the-job training that occurs as participants work in schools. Although often not actively considered by the programs, the contexts of participants' placements, discussed next, matters.

*School context*

Following our initial school visits, we were convinced that school context played an important role in an alternative route teacher's development. While programs often cannot control participants' school contexts, they can control the support they provide to participants teaching in various contexts. This consideration is especially important because many alternative certification participants are assigned to difficult schools characterized by a lack of teacher support and a high-need student population. For example, in four of the five New York City schools we visited, fewer than half of the students met standards in English language arts or mathematics. Many participants across programs also reported that they were assigned far more high-need students than other teachers in their schools. One general education teacher, for example, had 6 out of 21 students with individualized education plans and another 6 who were English learners.

There probably is no precise recipe to create a school that helps alternative certification participants succeed, but our survey analysis identified collegial relationships, strong leadership, and adequate supplies and materials as important components.

Factor analysis indicated that professional collegial environments were ones in which teachers analyze student work samples together; seek each other's advice about instructional issues and problems; observe each other's classrooms and offer feedback and/or exchange ideas; and

discuss student assessment data to make decisions about instruction. The teacher professional communities in the participants' placement schools ranged from robust to non-existent. While some programs such as TEI place greater percentages of their participants in schools with strong teacher professional communities, even TEI does not place all participants in strong collegial environments. Within single programs, then, participants may or may not have the opportunity to learn from and be supported by their colleagues.

Administrators, like teacher colleagues, can also serve as a source for growth or interfere with participants' development. Across all seven programs, two-thirds of participants reported that their school administrators worked to ensure that teachers have the support they need to be successful; however, only 50 percent of participants reported that teachers in their school trust the school administrators. Thirty percent reported that their opinions about instruction were different from the principal's opinions.

As with other conditions, we found a great deal of variation in administrative support across and within alternative certification programs. For example, one participant described how a lack of administrative support has made her professional life more difficult:

> My AP is very unhelpful. She gives me useless crap that I'll never be able to use. She gave me bead patterns but no beads to go with them. She hasn't given me the photocopies I asked for. On Monday my paraprofessional was absent, and I had two boys throwing chairs around. I sent a kid to get her, and she refused to come get them.

In contrast, a participant in a supportive school described administrators who are available and helpful: "I can go to the principal of the school. I can just walk into his office. We have a grade leader who knows everything. She makes everything easy for you."

In addition to needing support from colleagues and administrators, alternative certification participants need appropriate materials and supplies for their classrooms. Many participants, however, are working in schools that do not provide the necessary materials for the job. Across all programs, just over one-half of participants reported that they have the necessary textbooks and print resources to teach; fewer than half (42%) reported that they can get instructional materials (e.g., lab supplies, math manipulatives, classroom library books) without buying them; and fewer than half (45%) of reported that they can get needed classroom supplies (e.g., paper, pencils, staples, tape) without buying them. The

availability of materials influences what the participants feel they can do in the classroom. As one teacher said, "I cut out a lot of things that I would like to do with the kids because I know the final expense would be too great for me." Some participants spend a great deal of their own money buying materials and supplies for their classrooms. We heard estimates ranging from several hundred to several thousand dollars of personal money spent for professional purposes.

Alone, each of these context variables—professional community, administrator support, and availability of materials—can influence teachers' development and their enjoyment of teaching. The combination of factors, however, can have a profound effect on how teachers perceive teaching and how much they are able to learn on the job.

Next, we turn to an examination of how participant characteristics (i.e., educational background and previous teaching experience) and program characteristics (i.e., coursework, mentoring, and school context) contribute to different outcomes.

## LINKING PARTICIPANT AND PROGRAM CHARACTERISTICS TO PROGRAM OUTCOMES

Because the variation in participant experiences within programs was sometimes as great as the variation between programs, we questioned our ability to determine characteristics of effective programs simply by comparing different programs. Consequently, we added the concept of "paths into teaching" to our analysis, clustering groups of individuals across programs based on a set of common background characteristics and experiences. We considered those input variables that emerged from the descriptive analysis provided above, including:

- Academic background: Using Barron's 6-scale university selectivity ranking, participants whose undergraduate institutions are levels 5 and 6 are considered competitive, and levels 1 and 2 are considered less competitive.
- Previous teaching experience: Participants are considered experienced if they have had nine months' or more previous experience as a classroom teacher, aide, or substitute.
- Perceived quality of coursework: Participants who rated either their pre-service or in-service coursework very or moderately important are said to have had valuable coursework. All others are said to have had poor coursework.
- Frequency of mentoring: Using a factor score that combined the frequency of nine mentoring activities, we consider those in the

top quartile of the factor to have frequent mentoring, and those in the bottom quartile to have infrequent mentoring
- School environment: Using a factor score combining administrator support, teacher professional community, and availability of materials, we consider those in the top and bottom quartile to have a good and challenging context, respectively.

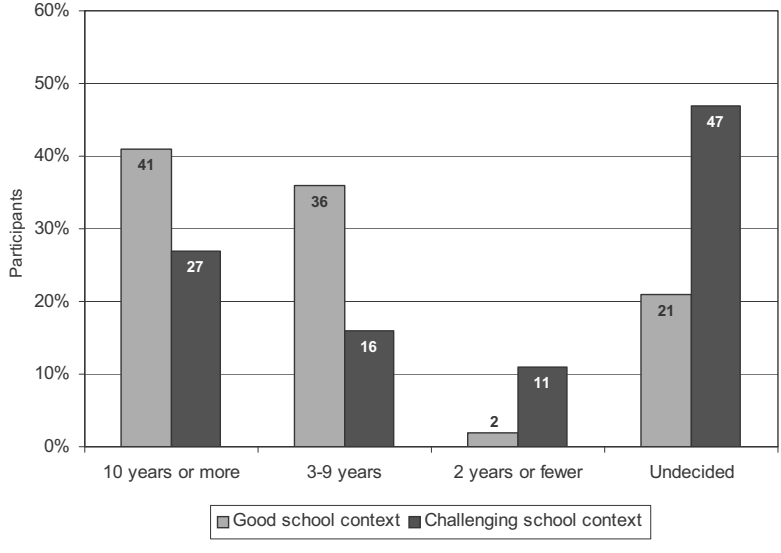
Outcome measures we considered include predicted retention, knowledge for teaching, teacher self-efficacy, and teacher-reported growth. Although our study did not include a student achievement component, we discuss the existing research on alternative certification and student achievement and the implications of our research on future student-achievement analyses. Next, we describe each of these outcomes and the input variables that impact them.

*Teacher retention*

The existing research on the retention of alternatively certified teachers is mixed, though it appears that some programs are more effective than others at preparing alternative route teachers who stay in the profession (Darling-Hammond, 1994; Dial & Stevens, 1993; Haberman 1999; Hutton, Lutz, & Williamson, 1990; Paccione, McWhorter, & Richburg, 2000; Stoddart, 1990; Wilson et al., 2001; Wise, 1994). The programs we studied had different goals regarding teacher retention. For MMTEP, retention is a key goal and their strategy of recruiting teachers' aides is a conscious effort to develop individuals already committed to working in the Milwaukee public schools. In contrast, Teach For America's goal is leadership development, not teacher retention. Some programs attract individuals who, at the outset, plan to stay in teaching, though the programs may not specifically recruit for this commitment. Candidates for Elk Grove's TEI, for example, purposely seek out the program because they want to teach in the sponsoring district. Upon entering the program in the fall, more than three-quarters of TEI participants reported that they planned to teach for 10 years or more; by contrast, only 11 percent of Teach For America participants reported that they planned to teach for that long. In addition, nearly half of TEI participants reported that "teaching has always been their calling," compared to only 12 percent of Teach For America participants. Thus, one way that programs can promote low attrition is to select individuals who are predisposed to a career in teaching. Besides the obvious finding regarding participant selection, we found that school context, coursework, and undergraduate institution selectivity all contributed to participants' career plans.

At the end of the first year in their programs, those participants who were working in a positive school environment had the most positive outlooks for retention (see Exhibit 5). Specifically, participants who worked in good school contexts were significantly more likely to have decided to teach three or more years than participants who worked in challenging school contexts. At the same time, participants in challenging school contexts were far more likely to be undecided about their future career plans than participants working in good school contexts.

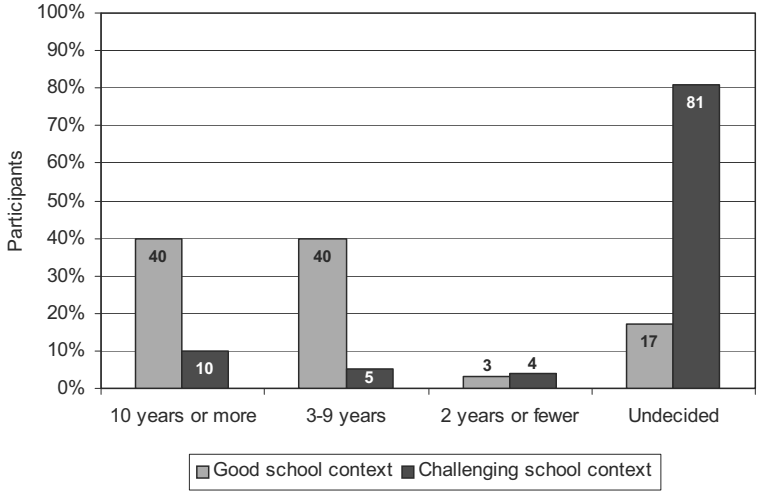
**Exhibit 5. Participants' Teaching Plans After 1 Year in the Program, by School Context****




**p < .01.
Source: SRI Survey of Alternative Certification Program Participants (2004).

Perhaps even more telling was the effect of school context on those participants who were undecided about their career plans when they began their program. Participants who were undecided in the fall were significantly more likely to have decided to make a career out of teaching if they worked in a good school context than in a challenging school context (see Exhibit 6). In contrast, over three-quarters of participants who were undecided in the fall remained undecided in the spring if they had worked in a challenging school context.

**Exhibit 6. Teaching Plans of Participants Who Were Undecided in the Fall After 1 Year in the Program, by School Context*****




***p < .001.

Source: SRI Survey of Alternative Certification Program Participants (2004).

School context was the most important factor in participants' career plans, though coursework and the competitiveness of participants' universities also were influential. Forty percent of participants who received valuable coursework planned to teach 10 years or more, compared to only 22 percent of those who received less valuable coursework. Those from less competitive universities also planned a longer career in teaching than those from more competitive universities; 61 percent versus 23 percent planned to teach for 10 years or more, respectively.

Other factors such as mentoring and previous teaching experience did not appear to have as much of an influence on participants' career plans. Readers should be careful not to over-interpret these findings, however. While mentoring did not appear to have an impact on participants' career plans, only a small minority of participants received the kinds of mentoring support that they found most valuable. Similarly, while having experience in the classroom did not seem to influence participants' plans, teaching experience did impact participants in other ways, discussed below. Rather than suggesting that mentoring does not influence retention, our finding is that the quality of the school place-

ment is key to increasing the predicted retention of alternative certification participants.

*Participant knowledge for teaching*

A complicated outcome we measured was participants' knowledge for teaching. Teacher knowledge includes both command of the subject matter to be taught and the knowledge of how to teach that particular subject matter. Specifically, teachers need the following types of knowledge to be effective: knowledge of the content itself, which includes common content knowledge and specialized knowledge for teaching; knowledge of content and students; and knowledge of content and teaching (Ball & Bass, 2003; Ball, Hill, & Bass, 2005). Measuring teachers' knowledge is a challenging task. We needed instruments that were reliable and valid, and that were sensitive enough to measure differences among respondents and changes in respondents over time.

To increase the precision of our survey, we used items from the Study of Instructional Improvement (SII) being conducted by researchers at the University of Michigan (Deborah Ball, David Cohen, and Brian Rowan, Principal Investigators). SII researchers have developed a bank of survey items that measure teachers' knowledge for teaching reading/language arts and mathematics at the elementary level (see, for example, Hill, Schilling, & Ball, 2004; Phelps & Schilling, 2004). Our intent in using the SII items was to use already field-tested items.

The SII items have been tested extensively and have been tied to student achievement and classroom practice. Tests on the items measuring reading knowledge suggest that they effectively measure knowledge for teaching reading rather than simply reading ability. A recent study reported that teachers and non-teachers showed no significant difference in common reading ability; however, teachers scored significantly higher than non-teachers on the measure of content knowledge for teaching reading (Phelps, 2005). Another study showed a positive relationship between teacher knowledge in mathematics and student achievement (Hill, Rowan, & Ball, 2005).

Although the knowledge items are tested and reliable, we present these data with several caveats. First, the survey items were not developed for novice teachers, though novices are the target population of this study. Thus, the survey items had been thoroughly tested for reliability and validity by the developers, but they had not been tested for the specific population of teachers we surveyed. Second, we were limited in the number of knowledge questions we could pose in our survey. Because our survey was more comprehensive, asking about background, program

experiences, and outcomes, in addition to knowledge for teaching, we had to select a sample of questions in the broader area of knowledge to keep the survey to a manageable size. From the bank of items, we selected six reading testlets (comprising 29 questions), and 10 math testlets (comprising 31 questions), varying in content and difficulty. Further, the questions were not matched to the teacher-preparation curricula of the various programs. The questions capture a range of knowledge used by elementary school teachers, but are not necessarily taught by the seven alternative certification programs.

In addition, the use of these items had several implications for our sample. First, since the survey items were developed for elementary school teachers, we present data for this population of teachers only. Thus, our sample size in some of the programs is notably decreased, and there are no measures for NC TEACH participants, because that program only prepares secondary school teachers. Second, our design called for surveying participants at the beginning of their program and again at the end of the first year. For several of the programs, we were able to survey participants within their first week of training. For a few, however, we were not able to administer the pre-program survey until part-way through the first year. So, for example, Texas Region XIII and MMTEP participants had essentially no training at the administration of the first survey. Some New York participants, on the other hand, had already completed their summer training prior to completing the survey. Differences in initial scores and growth scores could be contributed, in part, to the variances in the timing of when the initial survey was administered.

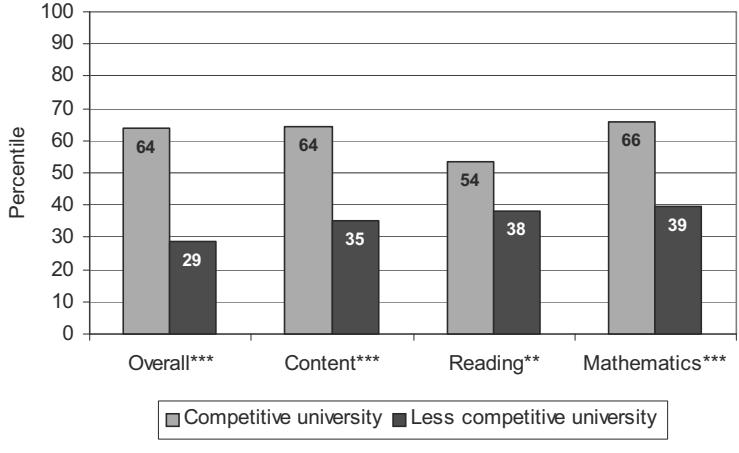
We conducted a factor analysis of the knowledge for teaching items and found that the items comprised three distinct constructs.[6] The first factor, *content knowledge*, measures reading and mathematics content knowledge not specifically related to knowledge about teaching. The second factor, *knowledge for teaching reading*, measures teachers' knowledge of strategies for teaching reading. The third factor, *knowledge for teaching mathematics*, measures teachers' ability to understand students' thinking in mathematics. We also found a single factor solution that we use to discuss *overall knowledge for teaching*.[7]

We were interested in measuring participants' knowledge both in the fall and in the spring. The fall measures are important because they represent what the participants initially bring to their students. We hypothesized that there were two variables that could possibly impact fall knowledge measures—participants' intellectual competencies (either innate or learned), and their previous experience in classrooms—since the knowledge measures were both of content and of understanding students and pedagogy. The spring measures provide insight into the contribution of

the alternative certification program to participants' knowledge growth.

We found that only university selectivity (our proxy measure for participants' intellectual competencies) made a difference in participants' fall knowledge measures. Specifically, participants who had attended a competitive university (i.e., Barron's selectivity ranking 5 or 6) scored significantly higher on all knowledge factors than participants who attended a less competitive university (i.e., Barron's selectivity ranking 1 or 2) (see Exhibit 7). On the overall knowledge factor, participants from competitive universities scored, on average, in the 64th percentile of all survey respondents, whereas participants from less competitive universities scored, on average, in the 29th percentile. We found no significant differences in knowledge measures between participants with or without previous classroom experience upon entering the program.

**Exhibit 7. Percentiles of Fall Teaching Knowledge Scores, by University Selectivity**

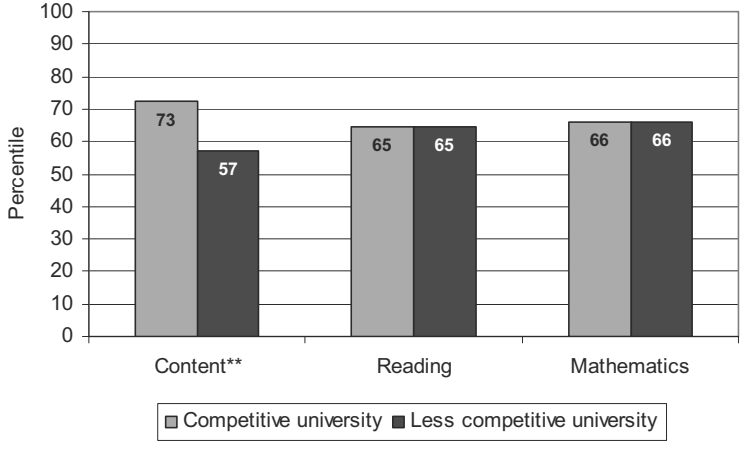



***p < .001, **p < .01.
Source: SRI Survey of Alternative Certification Program Participants (2003).

In the spring, the scores between participants who attended competitive and less competitive universities were significantly different for content knowledge, but were not significantly different for knowledge for teaching reading or mathematics (see Exhibit 8).[8] On the overall knowledge factor, participants from competitive universities, on average, scored in the 74th percentile of all survey respondents; participants from less competitive universities, on average, scored in the 64th percentile.

On the knowledge for teaching reading and mathematics factors, the average percentile rank of participants from competitive and less competitive universities were identical, regardless of their incoming scores. Thus, most initial differences in knowledge due to intellectual prowess are eliminated by the end of the first year of the program, with the exception of content knowledge.

**Exhibit 8. Percentiles of Spring Teaching Knowledge Scores, by University Selectivity**



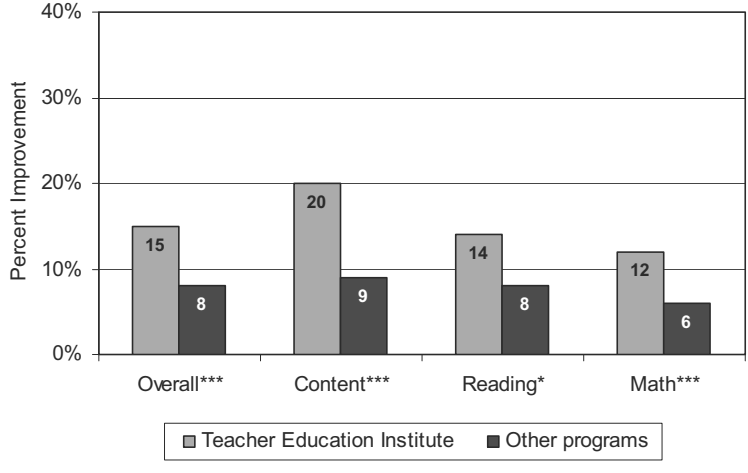

**p < .01.
Source: SRI Survey of Alternative Certification Program Participants (2004).

The pertinent question raised, thus, is what contributes to participants' growth? At the outset of the analysis, we hypothesized that many variables could impact knowledge for teaching: school context, valuable coursework, high-frequency mentoring, classroom experience, in addition to university selectivity. Our analysis of the spring knowledge scores showed that university selectivity continued to contribute to content knowledge, but no longer showed significant contributions to knowledge for teaching reading or mathematics. Although our analysis did not provide a definitive explanation of the variables that contributed to growth in knowledge for teaching reading and mathematics, a closer examination of the gain scores and our understanding of the different program designs suggest a reasonable hypothesis.

When examining the fall to spring gain scores of participants in different programs, we noticed that participants in Elk Grove's TEI had significantly larger gains in the percent of knowledge questions correct

than all other programs (see Exhibit 9). On the overall knowledge factor, TEI participants grew 15 percent compared to 8 percent for participants in all other programs. There were significant differences in all subfactors as well.

**Exhibit 9. Percent Improvement in Knowledge Questions Correct: Teacher Education Institute vs. All Other Programs**




***p < .001, *p < .05.
Source: SRI Survey of Alternative Certification Program Participants (200 3, 2004).

We surmise that the strong growth apparent in the TEI program is due to several factors. First, participants in this program have more opportunity to increase their content knowledge scores because of the nature of their coursework. Unlike the coursework in other programs, TEI coursework has a consistent focus on literacy and numeracy, starting early in the program and continuing for the entire year. Second, TEI participants appeared to have benefited from their two-semester-long practicums, leading to increased knowledge for teaching reading and mathematics. During the practicums, TEI participants have the opportunity to observe several master teachers lead classrooms and to discuss the content and pedagogical strategies of the lessons. In contrast to the other programs in which participants are solely responsible for a classroom, most TEI participants have guided classroom teaching experiences.

Importantly, we found gains on knowledge scores for all but one program. Our measures of the variables were not precise enough to determine the contribution of each variable to the gains. Still, the large gains

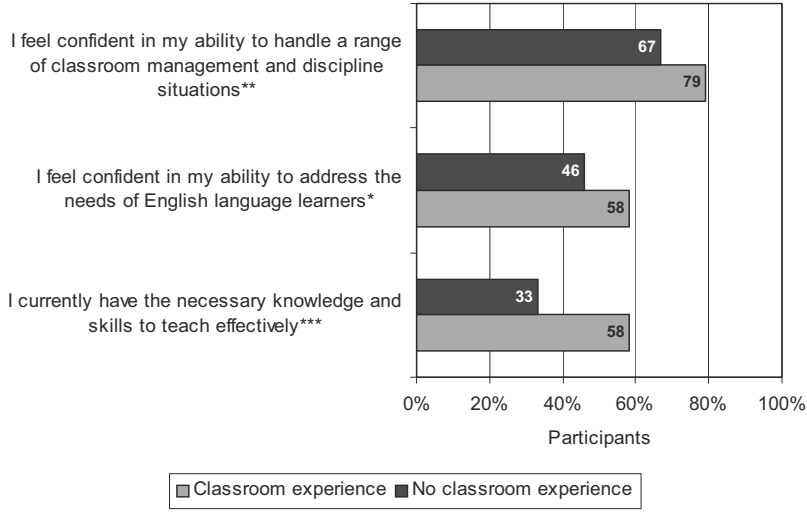
among TEI participants led us to hypothesize that the interaction of guided classroom teaching, coursework with a strong and consistent content emphasis, and other in-school supports increases knowledge to teach scores among all participants, not just those from competitive universities and colleges.

*Teacher efficacy*

Another outcome variable we analyzed was teachers' self-efficacy, a characteristic that is important to foster early in the career (Darling-Hammond, Chung, & Frelow, 2002). Reviewing literature on teacher efficacy, Tschannen-Moran, Hoy, and Hoy (1998) reported that self-efficacy has been found to be related to student achievement, motivation, and students' sense of efficacy.

Teacher efficacy was impacted by three input factors: teacher experience, school context, and coursework. Because alternative certification participants begin teaching prior to receiving a majority of their training, we were curious about their efficacy going into their programs. We found that alternative certification participants who had prior experience in a

**Exhibit 10. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Fall, by Experience**

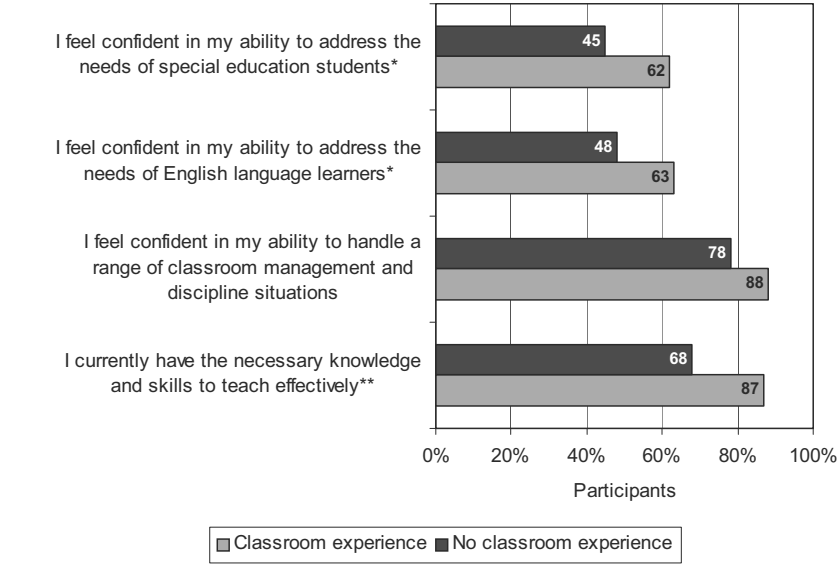



***p < .001, **p < .01, *p < .05.
Source: SRI Survey of Alternative Certification Program Participants (2004)

classroom were significantly more likely to be confident in their teaching abilities than participants with no classroom experience. Specifically, teachers with experience felt more confident with classroom management, their ability to address the needs of English-language learners, and their general ability to teach effectively (see Exhibit 10).

The impact of having prior classroom experience continued throughout the first year of the program. In the following spring, just as in the fall, teachers who had prior classroom experience felt more confident in their teaching abilities than those with no prior classroom experience (see Exhibit 11). Over four-fifths (87%) of participants with prior classroom experience reported that they have the necessary knowledge and skills to teach effectively, compared to just over two-thirds (68%) of participants with no such experience.

**Exhibit 11. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Spring, by Experience**



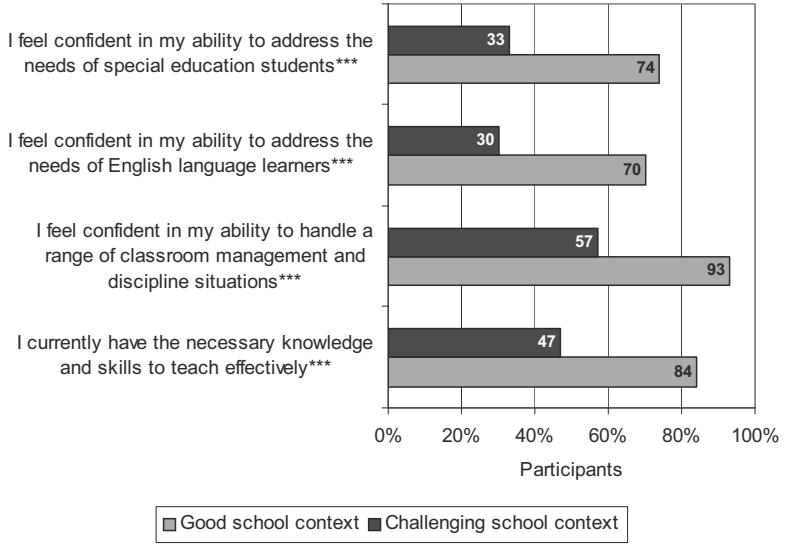

**p < .01, *p < .05.

Source: SRI Survey of Alternative Certification Program Participants (2004).

School context, like prior teaching experience, also impacted teacher efficacy. A supportive context can be empowering, making teachers feel like they have the skills and knowledge to be successful in the classroom. A challenging school context, on the other hand, can make alternative certification participants question their own abilities. On all

four of the efficacy measures, participants in good school contexts had stronger feelings of efficacy than teachers in challenging school contexts (see Exhibit 12). They feel more confident in their ability to address the needs of special education students (74% vs. 33%, respectively) and their ability to address the needs of English-language learners (70% vs. 30%). They also had more confidence with regard to their classroom management (93% vs. 57%), and in their knowledge and skills to teach effectively (8%4 vs. 47%).

**Exhibit 12. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Spring, by School Context**

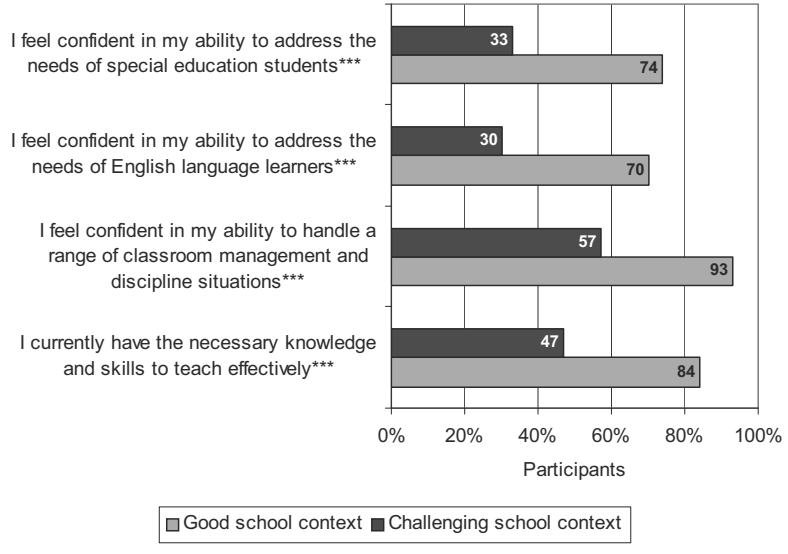



***p < .001.
Source: SRI Survey of Alternative Certification Program Participants (2004).

Coursework, too, had an impact on teacher efficacy. Alternative certification participants who felt that their coursework was valuable were significantly more likely to have stronger feelings of efficacy than teachers who reported their coursework as not valuable (see Exhibit 13). As with context, coursework impacted all measures of teacher efficacy.

Thus, teacher efficacy is enhanced by previous experience, a good school context, and valued coursework. Next, we examine teacher-reported outcomes.

**Exhibit 13. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Spring, by Value of Coursework**




***p < .001, **p < .01, *p < .05.
Source: SRI Survey of Alternative Certification Program Participants (2004).

*Teacher-reported outcomes*

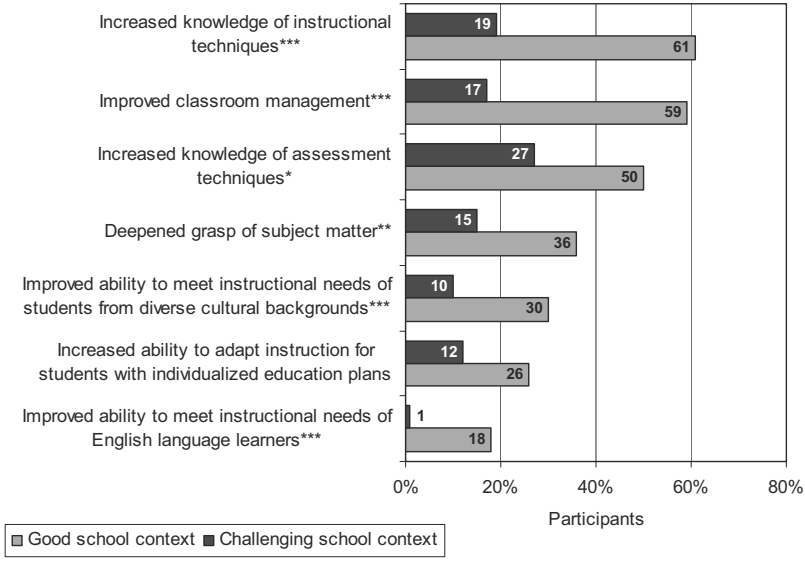
The last set of outcome measures we analyzed was teachers' self-reports on the contributions their programs made to their development. We asked about growth in many areas, including their instructional and assessment techniques, classroom management, subject-matter knowledge, and their ability to meet the instructional needs of special student populations. Obviously there are limitations to self-reports, particularly for new teachers who may not have the foundation or experience from which to judge their own growth. However, they do provide insights into what the participants believe they gained from their programs.

Across all seven programs, the areas in which the teachers reported experiencing the most growth were in instructional techniques and classroom management. Forty-two percent of participants reported growing a lot in instruction; 35 percent reported growing a lot in classroom management. The area of least development across all programs was preparing participants to work with special student populations. In fact, 40 per-

cent of participants reported that their program did not improve their ability to meet the instructional needs of English-language learners at all, and over one quarter (28%) reported that their program did not increase their ability to adapt instruction for special education students at all.

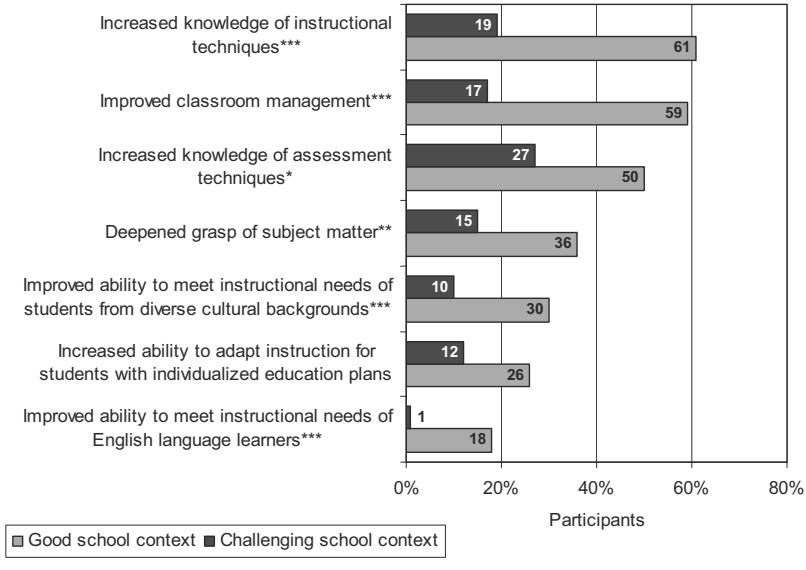
The paths into teaching analysis revealed three contributing factors to teachers' reported growth: school context, coursework, and mentoring. School context had the greatest impact on participants' self-reported outcomes. Alternative certification participants working in good contexts reported significantly greater gains than participants in challenging school contexts. Context impacted all self-reported outcome variables except one: increasing teachers' ability to adapt instruction for special education students. The difference between teachers in good and challenging school contexts was especially apparent in the knowledge they gained from their programs about instructional techniques, classroom management, and assessment techniques. Whereas nearly two-thirds (61%) of participants in good school contexts reported that their program increased their knowledge of instructional techniques a lot, less than one-fifth (19%) of participants in challenging contexts reported the same. Likewise, 59 percent of participants in good school contexts and

**Exhibit 14. Percent of Participants Reporting a Lot of Growth in Various Areas, by School Context**




***p < .001, **p < .01, *p < .05.
Source: SRI Survey of Alternative Certification Program Participants (2004).

**Exhibit 15. Percent of Participants Reporting a Lot of Growth in Various Areas, by Value of Coursework**

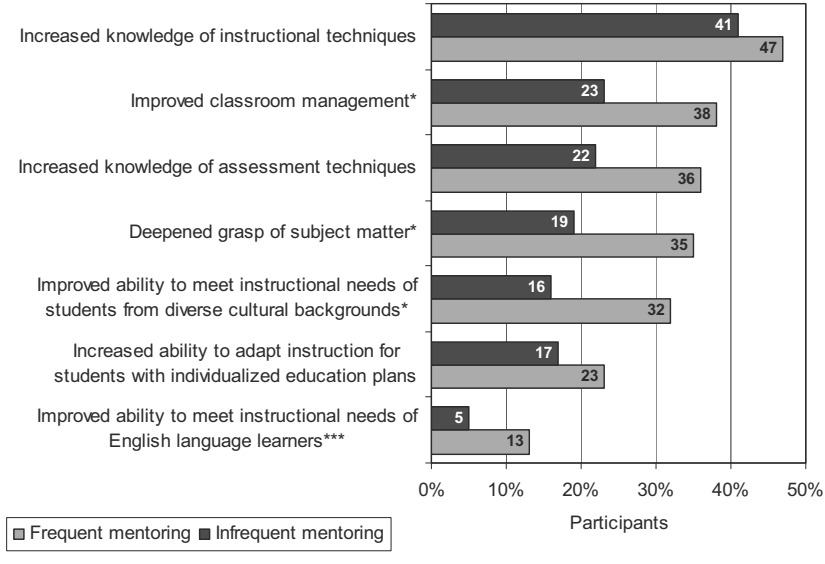



***p < .001.
Source: SRI Survey of Alternative Certification Program Participants (2004).

only 17 percent of participants in challenging contexts reported that their program improved their classroom management a lot (see Exhibit 14).

Despite the bad press that much teacher-preparation coursework receives, there were significant differences in teachers' self-reports of growth between those who identified their coursework as valuable and those who reported their coursework to be of no value (see Exhibit 15). With the exception of improving participants' ability to meet the instructional needs of English-language learners, coursework seemed to make a difference. Teachers who identified their coursework as valuable (compared to those who identified their coursework as not valuable) reported that their program increased their instructional techniques a lot (50% vs. 25%, respectively), increased their knowledge of assessment techniques (42% vs. 15%), and improved their classroom management (43% vs. 18%). On one outcome—increasing teachers' abilities to adapt instruction for students with individualized education plans—coursework was the only input variable to show a difference. Clearly alternative certifica-

**Exhibit 16. Percent of Participants Reporting a Lot of Growth in Various Areas, by Frequency of Mentoring**




***p < .001, *p < .05.
Source: SRI Survey of Alternative Certification Program Participants (2004).

tion participants feel that good coursework is beneficial to their growth.

Despite the heavy emphasis placed on mentoring by many of the programs and by the literature on alternative certification, mentoring impacted fewer self-reported growth outcomes than either school context or coursework. Alternative certification participants with more frequent mentoring reported that their program impacted their subject-matter knowledge, their ability to meet the instructional needs of English-language learners and students from diverse cultural backgrounds, and their classroom management (see Exhibit 16).

Despite the limits of teacher self-reports, we did find strong connections between teacher growth and a variety of program inputs.

*Student learning and alternative certification teachers*

The contribution of alternative certification teachers to their students'

learning is both the most important outcome of an effective alternative certification program and the most difficult to accurately measure. Thus far, there is no definitive research on alternative certification teachers and student achievement. Conducting a large-scale student achievement study was beyond the scope of this study. And, although this study had hoped to draw on existing research of the seven case study programs, we found no solid studies that could adequately address questions about student achievement.

Existing studies of the relationship between a teacher's route into the profession and student achievement gains are the subject of considerable controversy. Although there is solid research showing, for example, that students in secondary mathematics classes learn more from teachers with mathematics certification, studies have not yet shown whether the type of mathematics certification (standard, alternative, emergency) makes a difference (Goldhaber & Brewer, 2000). Several reports reveal no significant differences in student performances by students of teachers with different types of certification (Miller, McKenna, & McKenna, 1998; Stafford & Barrow, 1994). Other studies have found differences. Laczko-Kerr (2002) found that the students of Teach For America (TFA) participants performed similarly to other under-certified teachers yet did not perform as well as the students of certified teachers. Raymond, Fletcher, and Luque (2001) found that TFA participants in Houston produced more positive learning gains, and with greater regularity, than did other new teachers and all other teachers in the district, regardless of years of experience. This study has been criticized on methodological grounds, however (Laczko-Kerr, 2002; National Commission on Teaching and America's Future, 2001).[9] Further, Darling-Hammond, Holtzman, Gatlin, and Heilig (2005) reanalyzed the Houston data and reached the opposite conclusion. They found that certified teachers consistently produced significantly stronger student achievement gains than did uncertified teachers. In addition, they found that alternatively certified teachers, including Teach For America teachers, were generally less effective than certified teachers at raising student achievement. Not surprisingly, that study received sharp criticism from Teach for America proponents.

Another recent study of alternative certification and student achievement employed an experimental design that compared achievement scores of students randomly assigned to either a Teach For America teacher or another novice or veteran teacher in the same elementary school (Decker, Mayer, & Glazerman, 2004). The study found that students of Teach For America teachers outscored the control group of non-Teach For America teachers by three percentile points on the mathematics portion of the Iowa Test of Basic Skills. In addition, students of Teach

For America teachers scored about the same as the control group on the reading portion of the exam. Critics of the study raised concerns about the comparison group and pointed to the low achievement levels of both groups of students, and argued that the study's conclusions should have called into question the efficacy of Teach For America as a strategy to remedy low student achievement (Darling-Hammond et al., 2005; Viadero, 2004). Nonetheless, the study is one of very few that have tracked the student achievement of a program's graduates.

Our study was designed to draw on local program evaluations, but was not designed to collect original data on student achievement. While there were at least three studies of Teach For America (described above), we found no other comparable student achievement studies on the other six programs we examined. However, our examination of alternative certification programs and participants raises serious questions about the value of student achievement studies that try to compare traditional and alternative certification programs, or compare different alternative certification programs. Despite the desire of both researchers and policy-makers to have definitive student achievement studies of alternative and traditional certification, our research suggests that the variation within programs and among participants is so great that the program is probably the wrong unit of analysis. We suspect that until researchers can figure out how to cut down on the variation, we will continue to see student achievement studies that contradict each other or show minor differences. If student achievement studies are to better inform efforts to improve teacher preparation, then the studies will need to understand how the mix of a participant's education, background, experience, preservice coursework, school context, mentoring support, and in-service coursework combines into a path into teaching that is more or less effective at promoting student learning. Simply comparing student achievement of teachers from one program to another wrongly assumes that the program will be implemented as designed, the participants will experience the program in the same ways, and that the participants arrive at the program at the same starting point. Ultimately, the variation within programs is as great as the variation across programs, rendering program-to-program comparisons unhelpful.

While a complex study of teachers' paths into the profession would be a major contribution to the field, the contributions of individual inputs to various outcomes uncovered in our research have implications for improving student achievement. As we pointed out earlier, teacher retention, knowledge for teaching, and teacher efficacy have all been associated with higher student achievement. Thus, our findings suggest that alternative certification programs that can produce new teachers

who will stay in teaching for more than a few years, demonstrate knowledge for teaching, and have strong teacher efficacy are much more likely to produce student achievement gains than those that do not.

Next, we review the results of our paths into teaching analysis and discuss the implications of the findings for the development of effective alternative certification programs.

## SUMMARY OF OUTCOMES

The paths into teaching analysis revealed that each input factor contributed in some way, and that some input factors appeared to contribute a great deal to some positive outcomes. Next, we discuss each of the factors and the implications of each for alternative certification programs. The factors associated with positive outcomes are presented in Exhibit 17.

**Exhibit 17. Factors Associated with Positive Outcomes**

| | Undergraduate university selectivity | Previous classroom experience | School context | Coursework | Mentoring |
|---|---|---|---|---|---|
| Teacher knowledge | X | | | | |
| Retention | | | X | | |
| Efficacy | | X | X | X | |
| Reported growth | | | X | X | X |

### *School Context*

Most notably, alternative certification participants working in schools with strong leadership, adequate supplies and materials, and a collegial work environment were more likely to plan to stay in teaching, had more confidence in their teaching skills, and had a stronger sense of professional growth than those working in challenging schools. Clearly, placement matters.

Our case studies underscored this point through powerful, personal stories. We observed and interviewed teachers who were overwhelmed in schools characterized by unruly and undisciplined students, an absence of leadership, dreary facilities, a lack of basic supplies and materials, isolated teachers, and fear and mistrust. Although we did find some examples of alternative certification teachers who were managing in such schools, more often we found individuals who were exhausted, frustrated, and ready to quit. Three of the teachers from the original sample did quit before the year was out, and each was working in a highly

dysfunctional school. Many more who were working in such schools reported that they planned to leave at the end of the school year.

By contrast, in other schools that served similar populations of students, we found alternative certification teachers who were equally exhausted, but positive about their teaching and their decision to pursue an alternative route. These teachers pointed to the help they received from the school leadership and their colleagues, and to the overall school climate. In these schools, the principal presented a clear vision for the school, books and materials were ample, the building was clean and well-maintained even if old, and the interactions between teachers were positive and friendly.

Alternative certification programs are likely to face a big challenge in ensuring that their participants are placed in schools where they have an opportunity to learn and succeed. Many programs exist to ameliorate local teacher shortages. If a program's purpose is to find people to work in hard-to-staff, often dysfunctional, schools, it is unlikely they have much control over placement decisions. But, our findings are quite clear: a good school context is the most pervasive contributor to positive outcomes for teachers. Thus, an effective alternative certification program should make the placement of its participants a primary focus. In the majority of cases studied, treatments were the same for participants in all placements, although the needs were higher for teachers in challenging school environments. When alternative certification programs cannot control placement, accommodating for challenging school environments is of utmost importance. In addition, the importance of school context suggests that policy-makers have an obligation to address the problem of dysfunctional schools with strategies that do more than alleviate teacher shortages.

*Coursework*

Despite some critics' negative assessments of teacher-preparation coursework, coursework made a major contribution to teachers' sense of efficacy and professional growth. Although we did not analyze the content of coursework, our analysis of the course requirements, observations of classes, and interviews with participants suggested that much of the coursework was designed to be relevant to the immediate needs of the participants.

Through the case studies, we found that the value of the coursework was directly tied to other factors in the participants' experiences. Previous teaching experience appeared to provide a framework for understanding and application of the coursework. In addition, school

context appeared to play a role. Teachers in challenging school settings appeared to be at a disadvantage in applying the lessons of the coursework.

Coursework also had its limits. Few alternative certification participants reported that their coursework contributed greatly to their ability to teach special education students and English-language learners. In addition, coursework did not appear to contribute to improvements in knowledge for teaching reading and mathematics or their content knowledge in those areas.

Our evidence suggests that an effective alternative certification program should have a carefully crafted and well-timed sequence of coursework that is relevant to the challenges facing alternative certified teachers. Much more needs to be known about the characteristics of effective coursework and the other factors (classroom experience, school context) that enable the participant to apply the coursework. Coursework should be relevant both to participants with and without classroom experience, and to those in both supportive and challenging environments. Programs also would benefit from more attention to the specific skills and knowledge associated with teaching different subject areas.

*University selectivity and teaching experience*

Other research has demonstrated that a strong educational background can translate into student learning gains (Wayne & Youngs, 2003). And common sense tells us that having well-educated teachers is desirable for many reasons. Our research found that education background does contribute to performance on measures of teacher knowledge. This finding is particularly important as other research suggests that subject knowledge for teaching is related to student achievement (Hill et al., 2005). At the same time, it is notable that educational background did not appear to be a factor in teachers' efficacy, predicted retention, or self-reports of growth. Regardless, effective alternative certification programs should select well-educated individuals or take steps to strengthen candidates' subject-matter knowledge and knowledge about teaching.

In addition, previous teaching experience contributed to teachers' sense of efficacy, a characteristic previously shown to be related to student achievement. Individuals with significant classroom experience bring a set of attitudes and beliefs that may enhance their performance in an alternative certification program. However, participants with previous classroom experience were no more likely to have plans to stay in teaching than participants without previous classroom experience. Further, previous teaching experience did not appear to have an effect

on teacher knowledge. The role of previous teaching experience in preparing teachers in alternative certification programs requires more research. At the very least, our findings suggest that the needs of experienced and inexperienced candidates differ, and effective alternative certification programs recognize their differences.

*Mentoring*

Given the importance that programs place on mentoring, it was unexpected to see somewhat limited contributions of mentoring on the outcome measures. Frequent mentoring was an important factor in teacher-reported growth in various areas of teaching skills and knowledge, but it did not appear to be a factor in the other outcome areas—predicted retention, knowledge for teaching, or efficacy. Although much more needs to be known about mentoring, our hypothesis is that much of the mentoring that participants received was of low quality. Only a small fraction of participants reported that their mentoring was very frequent or provided the kinds of assistance that they most valued. That said, mentoring still remains a key characteristic of an effective alternative certification program. What is missing is a concerted effort by programs to provide the training and resources mentors need to be effective.

## CONCLUSION

Our findings indicate that an effective alternative certification program is careful to place candidates in school settings that feature strong leadership, a collegial atmosphere, and adequate supplies and materials. Only the most exceptional candidates can succeed in dysfunctional schools. Effective alternative certification programs select well-educated individuals or take steps to strengthen candidates' subject-matter knowledge, and recognize that previous classroom experience is an advantage. In addition, effective programs provide carefully constructed and timely coursework that is tailored to candidates' backgrounds and the challenges that candidates face in their schools. Effective programs also provide each candidate with a trained mentor who is given the time and resources to plan lessons with the candidates, share curriculum ideas, demonstrate lessons, and provide feedback after frequent classroom observations.

While our research clearly points to the contributions of each of these characteristics, a simplistic list masks the complexity of preparing teachers through alternative routes. Because of the variation in how individuals experience the same alternative certification program, as well as

the variation in support and training within programs, the creation of effective programs defies simple recipes. In order to effectively prepare teachers, programs need to accurately assess each participant's teaching skills, knowledge, and performance at critical junctures, beginning with their selection and continuing throughout their training. Thus, effective programs also need to collect data on their participants' development through multiple methods (assessments, portfolios of teacher assignments and student work, observations, and interviews). Programs also need to assess each participant's teaching context and determine additional supports that may be necessary. Then, programs need to use all the information to tailor the training and supports to each participant's need. This approach is especially important considering that programs have little control over contextual factors that we have shown to greatly impact teacher development.

Although our research was focused on alternative certification programs, our findings are relevant to all forms of teacher preparation. The blurring of the line between traditional and alternative certification routes and our finding that paths into teaching is the appropriate unit of analysis suggests that educational background, school context, previous teaching experience, coursework, and mentoring all contribute to a new teacher's success.

In addition, our research suggests that the proper mix of candidates' backgrounds, program supports, and school placement can produce new teachers who are effective starting on the first day of school. The conventional wisdom that all new teachers must struggle during their first year is both inaccurate and a disservice to teachers and students. Thus, the final key characteristic of effective alternative certification programs is that they reject the assumption that floundering is a necessary part of new teachers' experiences. Instead, effective programs embrace the unconventional view that new teachers and their students cannot afford a lost year.

Finally, the study's findings point to the need for additional research on alternative certification. Much more needs to be known about the relative contributions of the various components of a path into teaching. Studies that compare the student achievement of alternative certification participants with similar backgrounds, support, and school placements are essential to confirm the findings of our study. Unfortunately, too much of the research in progress attempts to make program-to-program comparisons, a research design that is likely to find minor differences. Our study only began to explore inside the black box of alternative certification. Much more needs to be known about what and how participants in these programs learn, how programs can be tailored to address the

needs of a diverse set of participants, and how program components such as coursework and mentoring can be strengthened.

Despite the need for additional research, policy-makers should not wait to improve alternative certification. Our research reveals the preliminary roadmap to effective alternative certification programs.

## APPENDIX A: CASE STUDY PROGRAMS

The following descriptions of the seven case study programs are based on data collected between 2003 and 2004. Though the programs may have changed since then, we provide these descriptions because they depict the programs as we researched them.

### *The Teacher Education Institute (TEI) in the Elk Grove, California, Unified School District*

TEI serves about 100 participants annually, and offers certification for all grade levels, K-12, and in all subject areas. Operated as a partnership between the Elk Grove Unified School District in northern California and San Francisco State University, the program aims to meet the district's growing need for credentialed teachers and to increase teacher quality by training teachers specifically in the district's curriculum and instructional practices.

TEI is based on an apprenticeship model and includes a combination of coursework, observations, and student teaching. After attending 80 hours of coursework during the summer, program participants spend the fall semester taking courses three days per week and participating in a student teaching internship for 16 hours per week. Internships are conducted with a "master teacher coach" who guides the intern's development. After an 80-hour intersession course, participants spend the spring in a second internship for four days per week. Both the fall and spring internships include two weeks in which the participant is a sole classroom teacher. Coursework continues in the spring, albeit at the reduced rate of five hours per week.

Entry requirements into TEI include a bachelor's degree and a minimum grade point average of 2.5. The program is funded through participant tuition and fees, which total approximately $9,000 per year.

### *Milwaukee's Metropolitan Multicultural Teacher Education Program (MMTEP)*

A partnership between the University of Wisconsin-Milwaukee's School of Education, the Milwaukee Public Schools, the Milwaukee Teachers'

Education Association, and the University of Wisconsin-Extension, MMTEP is a teacher-preparation program designed specifically for individuals who have been paraprofessionals or teacher's aides in Milwaukee for at least one year. The small program serves around 20 participants per year and offers licensure for teaching grades 1–8. The program aims to provide urban children living in poverty with effective teachers, recruit and prepare African-American and other minorities into the teaching profession, and prepare teachers who will remain in the Milwaukee system.

During a six-week summer session, program participants take university classes and teach in Milwaukee's summer schools. Their continuation in the program depends on a positive evaluation of their ability to relate to children and on their preparedness for assuming full-time teaching responsibilities. During the following school year, participants serve as the teacher of record, supported by a trained mentor who visits the classroom at least weekly throughout the year. Participants also continue to meet weekly for their university courses during this time.

In addition to having been a paraprofessional or teacher aide in Milwaukee for at least 1 year, applicants must have a bachelor's degree, pass interviews and background checks by both the Milwaukee Public Schools and the University of Wisconsin-Milwaukee, and be admissible as post-baccalaureate students to the university's School of Education.

*New Jersey's Provisional Teacher Program*

The New Jersey Provisional Teacher Program, established in 1984, was the first statewide alternative certification program in the country. It was designed to allow career changers and other talented individuals streamlined access to the teaching profession, and to eliminate the need to hire emergency teachers. To enroll in the program, individuals first obtain a certificate of eligibility authorizing them to seek a teaching position. Requirements include a bachelor's degree with a minimum grade point average of 2.75; a major in the discipline which the secondary school candidates teach; and a passing score on the Praxis II subject assessment test or National Teacher Examination (NTE) programs specialty area test. On the individual obtaining the certificate of eligibility and accepting an offer with a school, the hiring district registers the employment with the state's Office of Professional Development, the New Jersey Department of Education issues a provisional license, and the individual is recognized as an alternative-route teacher.

While working under the provisional license, the teacher attends a formal program offered by one of 32 regional training centers. Located

across the state, most training centers are operated by universities, although three are run by district consortia. The employing district or school also provides mentoring, supervision, and three evaluations—two formative and one summative. The alternative-route teachers pay a mentor $450 for full-time support during their initial 20 days of teaching, and an additional $550 for continued support over a 30-week period.

The New Jersey program offers certification in all grades and subject areas. More than 40 percent of New Jersey's teachers attain certification through the Provisional Teacher Program. In 2002–03, 2,700 individuals were part of the program.

*New York City Teaching Fellows Program*

The New York City Teaching Fellows program was created to fill vacancies in some of New York City's lowest-performing schools. Having prepared about 2,600 teachers in 2003, the Teaching Fellows program is one of the largest alternative certification programs in the country.

The Teaching Fellows program is a two-year program in which participants simultaneously work toward certification and a master's degree. Fellows participate in a two-month pre-service training during the summer that includes master's degree coursework; field placement work, in which Fellows observe and assist in classrooms; and Fellow Advisory meetings, in which Fellows meet together with an advisor to share experiences and to learn practical classroom skills and management techniques. In the following two academic years, Fellows serve as teachers of record, and ongoing program components include continued master's degree coursework, school-based mentors, university-based mentors, and meetings with other Fellows. Master's degree coursework is provided by a dozen local public and private colleges and universities.

The New Teacher Project works with the Fellows Program in recruiting and selecting candidates for the program. In addition to meeting the minimal requirements of a bachelor's with a minimum grade point average of 3.0, candidates must participate in an interview event in which they teach a sample lesson, discuss education-related articles, respond to specific classroom issues, and engage in a one-on-one interview.

The program offers certification in all grades and content areas, but is especially dedicated to recruiting applicants eligible for and interested in teaching in a high-need subject area: bilingual education, English, mathematics, science, Spanish, or special education. Fellows receive a stipend during the pre-service training session to help defray living costs. However, they are responsible for $4,000 of tuition costs of their subsidized master's degree program.

*North Carolina's NC TEACH*

Established in 2000, NC TEACH (North Carolina Teachers of Excellence for All Children) was designed to support mid-career professionals who wanted to switch to a career in education. Administered by the University of North Carolina Office of the President in collaboration with the North Carolina Department of Public Instruction, NC TEACH serves more than 350 participants annually, and offers certification in middle grades (mathematics, science, social studies, and language arts), high school (mathematics, science, social studies, and English), and K-12 (Spanish, French, English as a second language add-on, and special populations).

NC TEACH participants attend an orientation followed by a five-week intensive summer institute of full-time coursework. Courses are offered at each of 13 University of North Carolina host campuses. After successfully completing the summer institute, participants teach full-time in a North Carolina public school while continuing to attend NC TEACH licensure classes and seminars. While serving as the teacher of record, each participant is assigned a mentor by the local education agency.

Requirements for admission to NC TEACH include a bachelor's degree; a 2.5 cumulative grade point average or higher for all postsecondary work; a degree with a major in, or relevant to, the desired licensure area; and at least three years of full-time work experience since graduation from college. NC TEACH participants pay regular tuition rates to their host universities' graduate schools.

*Teach For America*

Teach For America (TFA) recruits new college graduates from competitive universities to serve as teachers in hard-to-staff urban and rural districts. The program's overall goals are to close the achievement gap by providing teachers to under-resourced schools and producing future leaders who are committed to closing the achievement gap. Beyond minimal requirements for applications (i.e., 2.5 cumulative grade point average and a bachelor's degree), TFA accepts corps members who have records of achievement, are committed to the TFA mission, accept responsibility for outcomes, demonstrate organizational ability, show respect for others, and possess critical thinking skills.

TFA corps members attend a five-week summer training session, and a one- to two-week orientation in their placement region. Before the session and orientation take place, corps members are expected to complete assigned readings, conduct structured observations of teachers focusing on specific topics covered in those readings, and hold follow-up

conversations with the teachers they observe. After completing the summer training, TFA corps members become the teacher of record in another classroom starting in the fall. During the school year, they receive ongoing support from the TFA regional office, including observations with feedback; content- or grade-specific learning teams that focus on key teaching issues; other workshops on specific instructional issues; discussion groups; and "all corps" meetings. TFA participants are also expected to attend a certification program offered by a local university or other credentialing program.

TFA corps members make a two-year commitment to teaching. In 2003, more than 1,800 corps members worked in 20 regions across the country.

*Texas Region XIII Education Service Center's Educator Certification Program*

The Texas Region XIII Education Service Center's Educator Certification Program aims to recruit mid-career professional and recent college graduates in high-need subject areas. The Texas Region XIII program offers certification in elementary education, elementary/bilingual education, special education, middle education in specific content areas, secondary education in specific content areas, and career and technology.

Before becoming teachers of record, program participants take courses offered online and at the Region XIII training center in the spring. They also participate in a two-week field experience while continuing their coursework. Participants must find employment as an intern in a school by October 1 to continue in the program. The vast majority who find a teaching job become teachers of record. During this intern year, they are supported by school-based mentors who are trained by Region XIII and by program-based field supporters. Coursework also continues during the intern year.

Program applicants must hold a bachelor's degree with an overall grade point average of 2.5 in all courses, or 2.75 in the last 60 semester hours completed; provide evidence of competency in reading, writing, and mathematics through test records, college coursework, or a master's degree; have the required coursework and semester hours for the desired certificate area; participate in an online structured interview; provide professional references; and have daily access to a computer. In 2003, more than 300 participated in the program. Participants must pay tuition, as well as testing and licensure fees, which total nearly $5,000.

## APPENDIX B: QUANTITATIVE STUDY METHODS

*Survey administration, response rate, and weighting*

We administered the survey to participants in each of the seven programs once before the program started (fall 2003) and at the end of their first year of teaching (spring 2004). In programs with less than 500 participants (Texas Region XIII, TEI, MMTEP, and NC TEACH), we surveyed the population. In the NYC Teaching Fellows Program, we surveyed a representative sample of 350 elementary and special education participants. In New Jersey, we surveyed the population of three of the 32 regional training centers. In Teach For America, we surveyed a representative sample of 350 teachers from one summer training institute.

We used mixed methods of survey administration to maximize the survey response rate, which included administration during course time, where possible, and direct mailing to individuals. The survey was mailed to NYC Teaching Fellows directly in both the fall and the spring. Because of varying program schedules, and because of the multiple methods used to collect the survey data, we accepted completed questionnaires between April and December 2003 for the pre-program survey, and between March and August 2004 for the post-program survey. Follow-up, which included mailing surveys and reminders to both home and school addresses and phone calls, was also conducted during this time, with a focus on programs with fewer respondents.

Exhibit B-1 displays the program populations at the time of each survey, as well as how many participants were surveyed, how many responded, the response rate and the range of the weights used in the analyses featured in this paper. In all analyses, participants were assigned weights based on the following characteristics: program, placement (general vs. special education and elementary vs. secondary), and status in the program (whether the participant was in the program in the fall only, the spring only, or both). There are multiple weights for each participant, depending on the analysis completed; the weight range is displayed in Exhibit B-1.

After closing the survey, we conducted a non-response study of the NYC Fellows Program due to the low response rate for this program. We sampled 10 non-respondents who represented a range of schools, based on an official need rating assigned by the New York City Department of Education. Six of the 10 sampled teachers responded to the phone survey in which we asked key survey questions and probed why they did not respond. Several participants expressed that they never received the survey, or that it was sent to a different address, and others said they did not

respond simply because they were very busy in their school placement. Based on these reports and their responses to survey questions (which were consistent with those who responded), we believe that our sample of NYC Fellows respondents does not differ significantly from the population.

**Exhibit B-1. Survey Participants, Respondents, and Weight Ranges, by Program**

| | | Fall survey | Spring survey | Both fall and spring survey |
|---|---|---|---|---|
| Texas Region XIII | Population | 340 | 236 | 216 |
| | Surveyed | 340 | 236 | 216 |
| | Responded | 285 | 229 | 209 |
| | Response Rate | 84% | 97% | 97% |
| | Weight Range | 1.00–2.05 | 1.00–1.09 | 1.00–1.13 |
| Teacher Education Institute | Population | 76 | 69 | 69 |
| | Surveyed | 76 | 69 | 69 |
| | Responded | 71 | 68 | 67 |
| | Response Rate | 93% | 99% | 97% |
| | Weight Range | 1.00–2.33 | 1.00–1.02 | 1.00–1.05 |
| MMTEP | Population | 19 | 17 | 17 |
| | Surveyed | 19 | 17 | 17 |
| | Responded | 17 | 13 | 13 |
| | Response Rate | 89% | 76% | 76% |
| | Weight Range | 1.00–1.13 | 1.31 | 1.31 |
| NC TEACH | Population | 478 | 302 | 296 |
| | Surveyed | 478 | 302 | 296 |
| | Responded | 322 | 143 | 124 |
| | Response Rate | 67% | 47% | 42% |
| | Weight Range | 1.08–4.43 | 1.50–2.33 | 2.35–2.55 |
| NYC Teaching Fellows | Population | 1606 | 1265 | 1265 |
| | Surveyed | 350 | 266 | 266 |
| | Responded | 126 | 61 | 52 |
| | Response Rate | 36% | 23% | 20% |
| | Weight Range | 10.91–18.25 | 19.34–36.40 | 18.3–24.75 |
| Teach For America | Population | 716 | 639 | 625 |
| | Surveyed | 350 | 302 | 302 |
| | Responded | 206 | 138 | 99 |
| | Response Rate | 59% | 46% | 33% |
| | Weight Range | 2.44–5.00 | 3.11–6.81 | 4.64–8.62 |
| New Jersey | Population | 279 | 353 | 261 |
| | Surveyed | 279 | 353 | 261 |
| | Responded | 170 | 217 | 125 |
| | Response Rate | 61% | 61% | 48% |
| | Weight Range | 1.48–3.50 | 1.00–14.00 | 1.91–2.01 |

*Factor analysis*

We conducted factor analyses on all items that we believed were part of a latent factor. We used MPLUS statistical software because of its ability to build models with dichotomous and ordered categorical variables. MPLUS produces sample correlations, eigenvalues, and the following statistics of model fit: (1) chi-square test, which, if significant, indicates a poor model fit; (2) the Root Mean Square Error of Approximation (RMSEA), which indicates satisfactory model fit if below 0.06; and (3) the Root Mean Square Residual (RMR), which indicates satisfactory model fit if below 0.08 (Hu & Bentler, 1999). It is important to note that the chi-square test is sensitive to sample size, with large samples often returning statistically significant chi-square values. For this reason, our analyses paid particular attention to the RMR and RMSEA as indicators of model fit, since neither is sensitive to sample size.

We initially conducted exploratory factor analyses (EFA). Based on the results of the EFA, we selected the items to be included in each factor. In most cases, we chose the factor with which the item loaded most strongly; in a few cases where items had multiple strong loadings, we grouped the item with the factor best fitting conceptually. Next, we discuss how we created each of the factor scores for school context, teacher knowledge, and mentoring.

*School context*

The school context variable is a factor score comprised of three separate factors: supportive administration, availability of materials, and teacher collaboration around instruction. The supportive administration and availability of materials factors were part of a larger set of questions with a four-point Likert scale of agreement on various statements. The four-factor solution of these items, which included factors for teacher trust and teacher stress level, had an RMSEA of 0.06 and an RMR of 0.02, as well as an eigenvalue that indicated a four-factor solution. The teacher collaboration items were part of a single analysis, with an RMSEA of 0.05 and an RMR of 0.02, as well as an eigenvalue that indicated a one-factor solution.

To create the school context factor score, we calculated the z-score of each item comprising the subfactors, using the unweighted mean and standard deviation. We then summed the z-scores of the items that belong in the factor, and calculated a z-score of that sum, producing three separate factor scores. To create the single school context factor, we summed the scores of the three factors and calculated the z-score of the

sum, using the weighted mean and weighted standard deviation of the sum. The result of these score calculations was a single continuous variable, which at the high end of the distribution indicates a supportive school context, as defined by the factors, and at the low end indicates a challenging school context.

*Frequency of mentoring*

The frequency of mentoring variable was created by completing a factor analysis on items with a five-point Likert scale of frequency of various mentoring activities. Exploratory factor analyses found three separate factors: (1) classroom visitation and feedback, (2) instructional planning and provision of materials, and (3) observations of the mentor's teaching. This model produced an RMSEA of 0.06 and an RMR of 0.02. In order to create a factor score, we calculated the z-score of each item comprising the subfactors, using the unweighted mean and standard deviation. We then summed the z-scores of the items that belong in the factor, and calculated a z-score of that sum. These calculations produced three separate factor scores. To create the single frequency of mentoring factor, we summed the scores of the three factors and calculated the z-score of the sum, using the weighted mean and weighted standard deviation. The result of these score calculations was a single continuous variable, which at the high end of the distribution indicates frequent mentoring and at the low end indicates infrequent mentoring.

*Knowledge for teaching*

The teacher knowledge analysis was completed by conducting a factor analysis on 56 dichotomous variables (with correct or incorrect answers). A missing data analysis was conducted, and only those respondents who answered over 80 percent of the questions in both the reading and math sections were included. In addition, respondents who answered "don't know" to over 75 percent of the knowledge questions were omitted. All others were included, and missing responses were treated as incorrect answers. Before conducting the factor analysis, items were grouped into 16 testlets, or groups of similar questions. Exploratory factor analyses of these testlets found three separate factors: content knowledge (in both reading and math), knowledge for teaching reading, and knowledge for teaching mathematics. This model produced an RMSEA of 0.01 and an RMR of 0.04. We also found a satisfactory one-factor solution, which produced an RMSEA of 0.06 and an RMR of 0.06.

Because we were concerned with being able to make comparisons

between fall and spring score, we used the spring weighted means and weighted standard deviations to create both the fall and spring factor scores. We calculated the z-score of each item comprising the subfactors, using the unweighted mean and standard deviation. We then summed the z-scores of the items that belonged in the factor, and calculated a z-score of that sum. To calculate growth scores, we subtracted the fall z-score from the spring z-score, then calculated the z-score of the difference, using the weighted mean and standard deviation of the fall score. This analysis only included elementary school teachers, which notably decreased our sample size, as well as eliminating from analysis NC TEACH, which only trains secondary teachers.

These calculations produced three separate factor scores and a one-factor solution that encompassed all three. The result of these score calculations was a single continuous variable, which at the high end of the distribution indicates high achievement on the measure of teacher knowledge and at the low end indicates a poor achievement. Note that in conducting our exploratory regression analysis (discussed briefly below) we used the teacher knowledge factor scores. However, all teacher knowledge analyses discussed in the body of this report used a simple average variable of the percent correct in each of the domains identified by our exploratory factor analysis.

*Outcome analysis*

In our analysis of paths into teaching, we were ultimately interested in which of the possible teacher characteristic and program treatment variables made an impact on specific outcomes. Toward this end, our preliminary analysis of the data used each of the outcome variables (teacher knowledge, teacher efficacy, predicted retention, and teacher-reported growth) as dependent variables in multiple regression analyses with the following as independent variables: school context, coursework, frequency of mentoring, classroom experience, and university selectivity, as well as program and placement variables, which were included in select analyses. Our strategy was to conduct stepwise regression analyses to study the relationships between program components, context, and outcomes, in order to examine the amount of variance in outcomes that is explained by each of the inputs. Once we identified the key inputs for each outcome variable, we completed the cross-tabulations presented in the body of this paper. Regression results are available by request from the authors. We now turn to a discussion of each of the components of the analyses featured in this report.

*School context.* The school context factor score is a continuous vari-

able, with a low score indicating challenging school context and a high score indicating a good school context. In the analyses represented in the body of the report, respondents were divided into weighted quartiles, with those in the top quartile considered to be in a "good" context and those in the bottom quartile considered to be in a "challenging" context. Note that these quartiles are not exactly even, due to response clustering. These two groups of participants are, indeed, teaching in quite different situations. For example, 83 percent of participants in good contexts reported that they have the instructional materials they need without purchasing them, compared to only 6 percent in challenging contexts. Similarly, 76 percent of participants in good contexts talk at least weekly with colleagues about instruction, compared to only 30 percent of those in challenging school contexts. Finally, 88 percent of participants in good contexts reported that their administrator is trusted by teachers, compared to less than 5 percent of those in schools with a challenging context. See Exhibit B-2 for the number of participants in each category.

*Coursework.* We asked about the importance of coursework both before and during the school year. In the body of the report, we considered those who reported they received moderately or very important coursework at either point to have had valuable coursework, while all others (including those who did not receive coursework) were considered to have received poor coursework. See Exhibit B-2 for the number of participants in each category.

*Frequency of mentoring.* The mentoring factor score is a continuous variable, with a low score indicating low-frequency mentoring and a high score indicating high-frequency mentoring. In the analyses represented in the body of the report, respondents were divided into quartiles, with those in the top quartile considered to have received high-frequency mentoring and those in the bottom quartile considered to have received low-frequency mentoring. Note that these quartiles are not exactly even, due to response clustering. Those in the high quartile received much more mentoring support; for example, 43 percent of those in the top quartile reported having planned lessons with their mentor at least monthly, while over 90 percent of those in the bottom quartile never participated in this activity. It is important to understand, however, that even in the top quartile of mentoring frequency, over half of participants received such support less than a few times over an entire year. See Exhibit B-2 for the number of participants in each category.

*Classroom experience.* In the body of the report, we considered participants experienced if they had nine months or more of classroom experience and inexperienced if they had none. See Exhibit B-2 for the number of participants in each category.

*University selectivity.* We used the Barron's 6-point scale university ranking, with a low score indicating the least competitive university and a high score indicating the most competitive university. In the analysis presented in the body of the report, levels 5 and 6 are considered competitive and levels 1 and 2 are considered less competitive universities. See Exhibit B-2 for the number of participants in each category.

Exhibit B-2 displays the number of participants (both weighted and unweighted) that fall into each category of the paths into teaching variables. Note, however, that numbers associated with exhibits in the body of the report may differ, based on individual item responses.

**Exhibit B-2. Number of Participants in Each Paths into Teaching Category**

| | Unweighted Number | Weighted Number |
|---|---|---|
| Good school context | 316 | 718.77 |
| Challenging school context | 110 | 702.45 |
| Frequent mentoring | 265 | 654.58 |
| Infrequent mentoring | 182 | 642.09 |
| Classroom experience | 461 | 1141.57 |
| No classroom experience | 311 | 1368.99 |
| Competitive university | 386 | 1086.26 |
| Less competitive university | 180 | 437.48 |
| Valuable coursework | 659 | 1833.98 |
| Poor coursework | 190 | 952.03 |

## TECHNICAL INFORMATION FOR EXHIBITS

**Exhibit 1. Percent of Participants Reporting that Their Coursework Was a Moderate to Very Important Source of Professional Support**

| | | All 7 programs | Teacher Education Institute | New Jersey | Texas Region XIII | MMTEP | NC TEACH | Teach For America | NYC Teaching Fellows |
|---|---|---|---|---|---|---|---|---|---|
| Moderately Important | % | 26.12 | 20.55 | 32.38 | 33.10 | 23.08 | 31.95 | 30.79 | 20.44 |
| | (SE) | (2.64) | (0.57) | (4.07) | (0.55) | (5.90) | (2.88) | (4.04) | (5.26) |
| Very Important | % | 27.32 | 59.07 | 39.48 | 36.84 | 46.15 | 34.59 | 14.64 | 23.72 |
| | (SE) | (2.76) | (0.62) | (2.49) | (0.53) | (6.98) | (2.94) | (3.23) | (5.67) |
| Unweighted Number | | 823 | 68 | 207 | 227 | 13 | 134 | 113 | 61 |
| Weighted Number | | 2682.18 | 68.90 | 326.17 | 234.28 | 17.03 | 283.57 | 492.19 | 1260.04 |

Chi-Square: 1539.16; P-value: <0.001. Additional response options were "not important" and "somewhat important." Those who answered "did not receive" were omitted.

**Exhibit 2. Frequency of Observations and Feedback from Program Staff and University Supervisors**

| | | All 7 programs | MMTEP | Teacher Education Institute | New Jersey | Texas Region XIII | NC TEACH | Teach For America | NYC Teaching Fellows |
|---|---|---|---|---|---|---|---|---|---|
| At least monthly | % | 34.13 | 84.62 | 55.88 | 43.60 | 39.97 | 34.06 | 27.10 | 24.54 |
| | (SE) | (2.82) | (5.05) | (0.74) | (1.75) | (0.55) | (5.98) | (3.73) | (2.72) |
| At least once | % | 53.88 | 15.38 | 44.12 | 51.43 | 59.58 | 46.50 | 72.90 | 49.91 |
| | (SE) | (2.94) | (5.05) | (0.74) | (1.78) | (0.55) | (6.25) | (3.73) | (3.11) |
| Unweighted Number | | 855 | 13 | 68 | 213 | 227 | 61 | 137 | 136 |
| Weighted Number | | 2807.06 | 17.03 | 68.90 | 347.16 | 234.28 | 1260.04 | 592.73 | 286.92 |

Chi-Square: 588.07, P-value: <0.001. "At least monthly" includes those answering "about monthly" or "at least weekly;" "at least once" includes those answering "once" or "a few times." "Never" was an additional response option.

**Exhibit 3. Frequency of Observations and Feedback from In-School Mentors**

| | | All 7 programs | Teacher Eduation Institute | NYC Teaching Fellows | Region MMTEP | Texas NC XIII | TEACH | New Jersey | Teach For America |
|---|---|---|---|---|---|---|---|---|---|
| At least monthly | % | 69.06 | 86.76 | 82.61 | 76.92 | 73.09 | 57.14 | 55.92 | 50.09 |
| | (SE) | (2.42) | (0.50) | (4.85) | (5.90) | (0.52) | (3.08) | (4.24) | (4.10) |
| At least once | % | 23.52 | 11.79 | 14.48 | 23.08 | 25.16 | 26.06 | 32.83 | 36.67 |
| | (SE) | (2.29) | (0.50) | (4.58) | (5.90) | (0.51) | (2.74) | (4.20) | (4.01) |
| Unweighted Number | | 860 | 68 | 61 | 13 | 227 | 138 | 215 | 138 |
| Weighted Number | | 2817.53 | 68.90 | 1260.04 | 17.03 | 234.28 | 291.10 | 350.34 | 595.84 |

Chi-Square: 727.34; P-value: <0.001. "At least monthly" includes those answering "about monthly" or "at least weekly;" "at least once" includes those answering "once" or "a few times." "Never" was an additional response option.

**Exhibit 4. Percent of Participants Reporting Receiving the Most Valued Mentoring Activities at Least Monthly**

| | | All 7 programs | Teacher Education Institute | MMTEP | Texas Region XIII | New Jersey | NC TEACH | NYC Teaching Fellows | Teach For America |
|---|---|---|---|---|---|---|---|---|---|
| Demonstrated lessons *(Chi-Square: 6344.59, P-value: <0.001)* | % | 13.85 | 72.81 | 30.77 | 15.15 | 17.88 | 6.71 | 14.54 | 4.4 |
| | (SE) | (2.29) | (0.61) | (6.46) | (0.42) | (4.10) | (1.69) | (4.81) | (1.91) |
| | $N_U$ | 803 | 66 | 13 | 225 | 205 | 122 | 57 | 11 |
| | $N_W$ | 2590.57 | 66.86 | 17.03 | 232.31 | 322.77 | 256.46 | 1181.93 | 513.21 |
| Jointly planned lessons *(Chi-Square: 3122.74, P-value: <0.001)* | % | 12.53 | 60.75 | 30.77 | 21.94 | 20.28 | 9.64 | 7.77 | 8.89 |
| | (SE) | (1.64) | (0.67) | (6.46) | (0.51) | (4.09) | (1.93) | (3.18) | (2.62) |
| | $N_U$ | 805 | 66 | 13 | 225 | 206 | 122 | 57 | 116 |
| | $N_W$ | 2595.16 | 66.86 | 17.03 | 232.31 | 324.25 | 256.46 | 1181.93 | 516.32 |
| Talked about specific students' needs *(Chi-Square: 2975.89, P-value: <0.001)* | % | 36.17 | 78.94 | 53.85 | 42.15 | 32.21 | 27.81 | 42.04 | 20.56 |
| | (SE) | (3.16) | (0.43) | (6.98) | (0.56) | (4.08) | (2.96) | (6.64) | (3.66) |
| | $N_U$ | 805 | 66 | 13 | 225 | 206 | 122 | 57 | 116 |
| | $N_W$ | 2595.27 | 66.86 | 17.03 | 232.31 | 324.36 | 256.46 | 1181.93 | 516.32 |
| Provided materials *(Chi-Square: 5549.8, P-value: <0.001)* | % | 28.10 | 83.37 | 61.54 | 38.27 | 32.79 | 26.90 | 24.77 | 20.44 |
| | (SE) | (2.81) | (0.52) | (6.81) | (0.56) | (4.14) | (2.93) | (5.86) | (3.57) |
| | $N_U$ | 801 | 66 | 13 | 225 | 203 | 122 | 56 | 116 |
| | $N_W$ | 2572.50 | 66.86 | 17.03 | 232.31 | 319.96 | 256.46 | 1163.56 | 516.32 |

"At least monthly" includes those answering "about monthly" or "at least weekly." Additional response options were "never," "once" and "a few times." $N_U$ = Unweighted Number, $N_W$ = Weighted Number.

**Exhibit 5. Participants' Teaching Plans After 1 Year in the Program, by School Context**

| | | Good School Context | Challenging School Context |
|---|---|---|---|
| 10 years or more | % | 40.53 | 26.82 |
| | (SE) | (4.07) | (6.61) |
| 3-9 years | % | 35.82 | 15.51 |
| | (SE) | (5.84) | (4.98) |
| 2 years or fewer | % | 2.29 | 11.06 |
| | (SE) | (1.03) | (3.22) |
| Undecided | % | 21.36 | 46.61 |
| | (SE) | (5.29) | (7.35) |
| Unweighted Number | | 315 | 109 |
| Weighted Number | | 717.77 | 700.75 |

Chi-Square: 18.19; P-value: 0.006.

**Exhibit 6. Teaching Plans of Participants Who Were Undecided in the Fall After 1 Year in the Program, by School Context**

| | | Good School Context | Challenging School Context |
|---|---|---|---|
| 10 years or more | % | 39.79 | 9.65 |
| | (SE) | (15.96) | (7.94) |
| 3-9 years | % | 40.37 | 5.20 |
| | (SE) | (16.22) | (3.71) |
| 2 years or fewer | % | 2.62 | 4.02 |
| | (SE) | (2.39) | (2.65) |
| Undecided | % | 17.22 | 81.13 |
| | (SE) | (6.69) | (9.23) |
| Unweighted Number | | 47 | 21 |
| Weighted Number | | 176.81 | 230.98 |

Chi-Square: 117.65; P-value: <0.001.

**Exhibit 7. Percentiles of Fall Teaching Knowledge Scores, by University Selectivity**

| Percentile: | Competitive University | Less Competitive University |
|---|---|---|
| Overall *(Wald F: 10.93, P-value: <0.001)* | 64 | 29 |
| Content *(Wald F: 8.84, P-value: <0.001)* | 64 | 35 |
| Reading *(Wald F: 5.02, P-value: 0.007)* | 54 | 38 |
| Mathematics *(Wald F: 6.76, P-value: 0.001)* | 66 | 39 |
| Unweighted Number | 161 | 48 |
| Weighted Number | 638.84 | 187.66 |

The average raw score for each group was translated into a percentile rank. By request of SII researchers, we do not report raw scores or the statistics associated with them, with the exception of tests of significance, which were conducted using means of raw scores. This analysis is cross-sectional (all fall respondents are included).

**Exhibit 8. Percentiles of Spring Teaching Knowledge Scores, by University Selectivity**

| Percentile: | Competitive University | Less Competitive University |
|---|---|---|
| Content *(Wald F: 4.81, P-value: 0.008)* | 73 | 57 |
| Reading *(Wald F: 1.44, P-value: 0.237)* | 65 | 65 |
| Mathematics *(Wald F: 1.08, P-value: 0.341)* | 66 | 66 |
| Unweighted Number | 117 | 41 |
| Weighted Number | 593.53 | 130.94 |

The average raw score for each group was translated into a percentile rank (using the fall scale). By request of SII researchers, we do not report raw scores or the statistics associated with them, with the exception of tests of significance, which were conducted using means of raw scores. This analysis is cross-sectional (all spring respondents are included).

**Exhibit 9. Percent Improvement in Knowledge Questions Correct: Teacher Education Institute vs. All Other Programs**

| Percent Improvement: | Teacher Education Institute | Other Programs |
|---|---|---|
| Overall (*Wald F: 28.01, P-value: <0.001)* | 14.93 | 7.89 |
| Content *(Wald F: 44.36, P-value: <0.001)* | 19.88 | 8.88 |
| Reading *(Wald F: 5.35, P-value: 0.021)* | 14.37 | 8.11 |
| Mathematics *(Wald F: 10.75, P-value: 0.001)* | 12.00 | 6.40 |
| Unweighted Number | 44 | 300 |
| Weighted Number | 46.20 | 1573.65 |

To calculate percent improvement, we divided the average of the individual growth scores by the total number of items in each test group. By request of SII researchers, we do not report raw scores or the statistics associated with them, with the exception of tests of significance, which were conducted using means of raw growth scores.

**Exhibit 10. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Fall, by Experience**

| | | Classroom Experience | No Classroom Experience |
|---|---|---|---|
| I feel confident in my ability to handle a range of classroom management and discipline situations *(Chi-Square: 11.35, P-value: 0.004)* | % | 79.43 | 66.62 |
| | (SE) | (2.18) | (3.09) |
| | $N_U$ | 607 | 441 |
| | $N_W$ | 1340.04 | 1694.82 |
| I feel confident in my ability to address the needs of English-language learners *(Chi-Square: 7.37, P-value: 0.025)* | % | 57.86 | 45.68 |
| | (SE) | (2.90) | (3.25) |
| | $N_U$ | 606 | 439 |
| | $N_W$ | 1338.54 | 1676.84 |
| I currently have the necessary knowledge and skills to teach effectively *(Chi-Square: 32.99, P-value: <0.001)* | % | 57.50 | 32.99 |
| | (SE) | (2.84) | (3.20) |
| | $N_U$ | 607 | 441 |
| | $N_W$ | 1340.04 | 1694.82 |

Response options were "strongly disagree," "disagree," "agree," and "strongly agree." $N_{U/W}$ = Unweighted/Weighted Number.

**Exhibit 11. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Spring, by Experience**

| | | Classroom Experience | No Classroom Experience |
|---|---|---|---|
| I feel confident in my ability to address the needs of special education students *(Chi-Square: 7.01, P-value: 0.031)* | % | 61.59 | 44.94 |
| | (SE) | (3.88) | (4.40) |
| | $N_U$ | 456 | 309 |
| | $N_W$ | 1121.29 | 1364.57 |
| I feel confident in my ability to address the needs of English-language learners *(Chi-Square: 6.69, P-value: 0.036)* | % | 62.57 | 47.49 |
| | (SE) | (3.97) | (4.54) |
| | $N_U$ | 453 | 306 |
| | $N_W$ | 1109.52 | 1356.65 |
| I feel confident in my ability to handle a range of classroom management and discipline situations *(Chi-Square: 3.34, P-value: 0.189)* | % | 87.63 | 78.22 |
| | (SE) | (3.04) | (4.13) |
| | $N_U$ | 455 | 306 |
| | $N_W$ | 1132.70 | 1358.76 |
| I currently have the necessary knowledge and skills to teach effectively *(Chi-Square: 10.33, P-value: 0.006)* | % | 86.61 | 68.23 |
| | (SE) | (3.15) | (4.73) |
| | $N_U$ | 415 | 248 |
| | $N_W$ | 961.31 | 924.97 |

Response options were "strongly disagree," "disagree," "agree," and "strongly agree." $N_{U/W}$ = Unweighted/Weighted Number.

**Exhibit 12. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Spring, by School Context**

| | | Good School Context | Challenging School Context |
|---|---|---|---|
| I feel confident in my ability to address the needs of special education students *(Chi-Square: 24.14, P-value: <0.001)* | % | 74.05 | 33.22 |
| | (SE) | (4.71) | (6.42) |
| | $N_U$ | 313 | 109 |
| | $N_W$ | 701.68 | 701.40 |
| I feel confident in my ability to address the needs of English-language learners *(Chi-Square: 28.90, P-value: <0.001)* | % | 69.63 | 29.95 |
| | (SE) | (3.86) | (5.78) |
| | $N_U$ | 311 | 108 |
| | $N_W$ | 697.57 | 698.29 |
| I feel confident in my ability to handle a range of classroom management and discipline situations *(Chi-Square: 18.36, P-value: <0.001)* | % | 93.36 | 57.42 |
| | (SE) | (3.37) | (7.11) |
| | $N_U$ | 313 | 108 |
| | $N_W$ | 713.93 | 700.40 |
| I currently have the necessary knowledge and skills to teach effectively *(Chi-Square: 17.43, P-value: <0.001)* | % | 83.55 | 47.05 |
| | (SE) | (4.83) | (6.88) |
| | $N_U$ | 313 | 108 |
| | $N_W$ | 713.93 | 694.59 |

Response options were "strongly disagree," "disagree," "agree," and "strongly agree." $N_{U/W}$ = Unweighted/Weighted Number.

**Exhibit 13. Percent of Participants Agreeing with Various Statements about Self-Efficacy in the Spring, by Value of Coursework**

| | | Valuable Coursework | Poor Coursework |
|---|---|---|---|
| I feel confident in my ability to address the needs of special education students *(Chi-Square: 11.88, P-value: 0.001)* | % | 59.41 | 36.79 |
| | (SE) | (3.15) | (5.19) |
| | $N_U$ | 655 | 190 |
| | $N_W$ | 1827.70 | 952.03 |
| I feel confident in my ability to address the needs of English-language learners *(Chi-Square: 4.80, P-value: 0.029)* | % | 56.85 | 41.47 |
| | (SE) | (3.52) | (5.76) |
| | $N_U$ | 651 | 186 |
| | $N_W$ | 1816.83 | 940.12 |
| I feel confident in my ability to handle a range of classroom management and discipline situations *(Chi-Square: 4.72, P-value: 0.030)* | % | 85.01 | 70.79 |
| | (SE) | (2.72) | (5.76) |
| | $N_U$ | 656 | 186 |
| | $N_W$ | 1828.75 | 945.87 |
| I currently have the necessary knowledge and skills to teach effectively *(Chi-Square: 8.76, P-value: 0.003)* | % | 81.41 | 59.99 |
| | (SE) | (3.24) | (5.99) |
| | $N_U$ | 652 | 190 |
| | $N_W$ | 1795.12 | 952.03 |

Response options were "strongly disagree," "disagree," "agree," and "strongly agree." $N_{U/W}$ = Unweighted/Weighted Number.

**Exhibit 14. Percent of Participants Reporting a Lot of Growth in Various Areas, by School Context**

| | | Good School Context | Challenging School Context |
|---|---|---|---|
| Increased knowledge of instructional ltechniques *(Chi-Square: 27.14, P-value: <0.001)* | % | 61.02 | 18.80 |
| | (SE) | (5.81) | (4.69) |
| | $N_U$ | 310 | 108 |
| | $N_W$ | 709.62 | 679.08 |
| Improved classroom management *(Chi-Square: 33.05, P-value: <0.001)* | % | 59.34 | 16.93 |
| | (SE) | (4.83) | (5.06) |
| | $N_U$ | 312 | 109 |
| | $N_W$ | 712.95 | 684.08 |
| Increased knowledge of assessment techniques *(Chi-Square: 6.69, P-value: 0.036)* | % | 49.88 | 27.27 |
| | (SE) | (5.63) | (6.73) |
| | $N_U$ | 311 | 108 |
| | $N_W$ | 711.95 | 682.49 |
| Deepened grasp of subject matter *(Chi-Square: 9.40, P-value: 0.009)* | % | 36.40 | 14.57 |
| | (SE) | (5.10) | (4.93) |
| | $N_U$ | 311 | 109 |
| | $N_W$ | 698.95 | 684.08 |
| Improved ability to meet instructional needs of students from diverse cultural backgrounds *(Chi-Square: 16.73, P-value: <0.001)* | % | 30.43 | 9.47 |
| | (SE) | (3.83) | (3.11) |
| | $N_U$ | 310 | 109 |
| | $N_W$ | 697.36 | 684.08 |
| Increased ability to adapt instruction for students with individualized education plans *(Chi-Square: 5.74, P-value: 0.057)* | % | 26.04 | 12.15 |
| | (SE) | (3.62) | (4.46) |
| | $N_U$ | 308 | 109 |
| | $N_W$ | 693.25 | 684.08 |
| Increased ability to meet instructional needs of English-language learners *(Chi-Square: 15.93, P-value: <0.001)* | % | 18.28 | 1.29 |
| | (SE) | (4.04) | (0.35) |
| | $N_U$ | 305 | 105 |
| | $N_W$ | 688.57 | 646.59 |

Additional response options were "not at all," "a little," and "somewhat." $N_{U/W}$ = Unweighted/Weighted Number.

**Exhibit 15. Percent of Participants Reporting a Lot of Growth in Various Areas, by Value of Coursework**

| | | Valuable Coursework | Poor Coursework |
|---|---|---|---|
| Increased knowledge of instructional techniques *(Chi-Square: 15.54, P-value: <0.001)* | % | 50.21 | 25.38 |
| | (SE) | (3.32) | (4.94) |
| | $N_U$ | 650 | 186 |
| | $N_W$ | 1817.19 | 929.24 |
| Improved classroom management *(Chi-Square: 16.77, P-value: <0.001)* | % | 42.54 | 18.01 |
| | (SE) | (3.21) | (4.36) |
| | $N_U$ | 652 | 185 |
| | $N_W$ | 1823.19 | 928.24 |
| Increased knowledge of assessment techniques *(Chi-Square: 25.46, P-value: <0.001)* | % | 41.63 | 14.93 |
| | (SE) | (3.31) | (3.82) |
| | $N_U$ | 651 | 186 |
| | $N_W$ | 1822.93 | 929.24 |
| Deepened grasp of subject matter *(Chi-Square: 30.70, P-value: <0.001)* | % | 32.64 | 8.41 |
| | (SE) | (3.04) | (3.05) |
| | $N_U$ | 653 | 186 |
| | $N_W$ | 1825.52 | 929.24 |
| Improved ability to meet instructional needs of students from diverse cultural backgrounds *(Chi-Square: 43.28, P-value: <0.001)* | % | 29.94 | 5.06 |
| | (SE) | (3.13) | (1.17) |
| | $N_U$ | 651 | 185 |
| | $N_W$ | 1821.60 | 927.65 |
| Increased ability to adapt instruction for students with individualized education plans *(Chi-Square: 48.22, P-value: <0.001)* | % | 24.54 | 2.36 |
| | (SE) | (2.74) | (0.57) |
| | $N_U$ | 649 | 183 |
| | $N_W$ | 1817.49 | 919.53 |
| Increased ability to meet instructional needs of English-language learners *(Chi-Square: 0.02, P-value: 0.878)* | % | 10.0 | 10.7 |
| | (SE) | (1.22) | (4.21) |
| | $N_U$ | 641 | 179 |
| | $N_W$ | 1800.95 | 885.67 |

Additional response options were "not at all," "a little," and "somewhat." $N_{U/W}$ = Unweighted/Weighted Number.

**Exhibit 16. Percent of Participants Reporting a Lot of Growth in Various Areas, by Frequency of Mentoring**

| | | Frequent Mentoring | Infrequent Mentoring |
|---|---|---|---|
| Increased knowledge of instructional techniques *(Chi-Square: 0.55, P-value: 0.760)* | % | 46.58 | 40.83 |
| | (SE) | (5.68) | (5.51) |
| | $N_U$ | 263 | 181 |
| | $N_W$ | 651.25 | 637.09 |
| Improved classroom management *(Chi-Square: 6.04, P-value: 0.049)* | % | 38.27 | 22.91 |
| | (SE) | (4.73) | (3.96) |
| | $N_U$ | 265 | 181 |
| | $N_W$ | 654.58 | 639.76 |
| Increased knowledge of assessment techniques *(Chi-Square: 4.50, P-value: 0.106)* | % | 35.79 | 22.42 |
| | (SE) | (4.88) | (4.09) |
| | $N_U$ | 264 | 181 |
| | $N_W$ | 653.58 | 640.50 |
| Deepened grasp of subject matter *(Chi-Square: 6.97, P-value: 0.031)* | % | 35.13 | 18.46 |
| | (SE) | (4.83) | (4.72) |
| | $N_U$ | 265 | 182 |
| | $N_W$ | 654.58 | 642.09 |
| Improved ability to meet instructional needs of students from diverse cultural backgrounds *(Chi-Square: 6.07, P-value: 0.049)* | % | 32.24 | 16.07 |
| | (SE) | (5.40) | (3.95) |
| | $N_U$ | 264 | 181 |
| | $N_W$ | 652.99 | 639.76 |
| Increased ability to adapt instruction for students with individualized education plans *(Chi-Square: 1.68, P-value: 0.433)* | % | 23.38 | 16.52 |
| | (SE) | (3.80) | (3.80) |
| | $N_U$ | 264 | 180 |
| | $N_W$ | 652.99 | 632.95 |
| Increased ability to meet instructional needs of English-language learners *(Chi-Square: 18.22, P-value: <0.001)* | % | 13.23 | 4.86 |
| | (SE) | (1.69) | (0.95) |
| | $N_U$ | 259 | 179 |
| | $N_W$ | 622.91 | 631.36 |

Additional response options were "not at all," "a little," and "somewhat." $N_{U/W}$ = Unweighted/Weighted Number.

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*Notes*

1. *Insights Into Alternative Certification: Initial Findings from a National Study* (Humphrey & Wechsler, 2005), was published by Teachers College Record and is available online at http://www.sri.com/policy/cep/pubs/teachers/AltCert_TCR_article.pdf

2 This article is the culmination of a three-year study sponsored by the Carnegie Corporation of New York, and is the third of three reports on the subject. The first report (Humphrey, Wechsler, Bosetti, Wayne, & Adelman, 2002) reviewed the existing research on alternative certification, posited a theoretical framework for the overall study, and presented the study design. The second report (Humphrey & Wechsler, 2005) examined the myths surrounding alternative certification's participants and programs.

3 Our survey methodology is elaborated in Appendix B.

4 Note that university selectivity is defined differently in this paper than in the previous report (Humphrey & Wechsler, 2005). The categories were altered for the analyses featured in this paper to create more distinct groups than the previous variable allowed.

5 Some of the teaching experience reported by New Jersey teachers may have been caused by delays in their paperwork. The *Newark Star-Ledger* (Teachers held up by state logjam, October 5, 2004) reported more than 1,000 new teachers had experienced delays in receiving their teaching certificates. Presumably, some of these new teachers were in the alternative certification programs.

6 For further information on the analysis, including factor loadings, fit statistics, and factor score calculations, see Appendix B.

7 Note that the factors we identified differ somewhat from the factors identified by the item developers at the University of Michigan.

8 In order to observe growth between fall and spring, the average scores on the spring survey were compared to the percentile rankings for the fall survey.

9 The National Commission on Teaching and America's Future (2001) criticized the study on a number of factors including the "extraordinarily unqualified group of new hires" (p. 2) against which the TFA candidates were compared. All of the TFA teachers were col-

lege graduates while in only one of the five years of the study did all of the other new teachers possess college degrees (they ranged from 65% to 94%). Additionally, all of the TFA teachers were enrolled in the alternative certification program but it is unknown how many of the non-TFA teachers participated in an alternative certification program. Furthermore, it is unknown how many non-TFA teachers had received certification prior to starting in the district. Laczko-Kerr (2002) recommends dismissing this TFA study due to lack of scientific rigor as the data are not available for independent verification.

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