TAKING STOCK
An Examination of Alternative Certification

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Who Goes into Early-Entry Programs?

Karen Hammerness and Michelle Reininger

The demographics of teachers—who they are and who people think they should be—rests at the center of many of the debates about early-entry certification. In response to concerns that teachers’ qualifications have been diminishing, some educators argue that early-entry certification programs can recruit more academically successful people into the profession. Others, concerned about the lack of diversity in the teaching population, have argued that early-entry certification programs might attract teachers with more varied ethnic and racial backgrounds.¹ Still others, who point to the need for teachers with greater content-area knowledge, have also argued that these programs can attract into teaching mid-career professionals who have expertise in high-need subject areas, such as science and mathematics.²

In short, many hopes and expectations surround the kind of teachers early-entry certification could potentially attract. However, we need to know much more about the nature of the demographics of early-entry certification teachers. To what extent do they fit the expectations, hopes, and ideas of those who have argued that such a
pathway will attract a new kind of candidate for teaching? Are these early-entry-certified teachers more racially diverse, professionally experienced, and academically strong? Or do they, instead, fulfill the concerns of those worried about the lack of qualification and experience of those entering through early-entry pathways? While early-entry certification is not a new phenomenon, the proliferation of these programs has occurred at a surprising rate in the past ten years (see chapter 1 of this volume, “The Development of Alternative Certification Policies and Programs in the United States”). Not surprisingly, research on who enters these programs is still relatively new and, given the rapid growth of early-entry programs, studies conducted even a few years ago can seem out-of-date.

In this chapter, we review research on who uses early-entry certification pathways for becoming a teacher. We focus on the most current research in this area, but we also include research from the recent past. In addition, while much of the research we share has been conducted nationally, we also provide data from our own work studying teacher-preparation pathways in New York City. A focus upon a particular setting for early-entry programs—and the candidates in specific programs—can help illuminate some of the questions and challenges surrounding the qualifications of teachers in these programs. Our sample includes twenty-six traditional programs and the two largest early-entry programs supplying teachers to New York City. In this way we provide a lens into the demographics of teachers for one particular urban school environment, to help shed light upon some of the ways in which a particular context can contribute to understanding variations and similarities across state and national levels. In addition, we are able to compare survey responses from the participants in the two early-entry programs as well as compare responses across traditional and early-entry programs.
Current research on teacher-preparation programs suggests that preparation programs are not monolithic, and comparing within and across all programs—early-entry and traditional—is essential in order to get a comprehensive picture of the differences between programs and pathways. Much of the expansion in early-entry certification in the past ten years has been seen in specialized programs, designed to attract a very specific population to teaching or to meet the staffing needs of a particular state, district, or even school.

The chapter is organized around four questions:

- What are the demographics of early-entry candidates?
- What do they bring to teaching?
- What factors led them to select an early-entry route?; and
- Where are they choosing to teach?

**DEMOGRAPHICS OF EARLY-ENTRY CANDIDATES**

Proponents of early-entry certification routes argue that creating these new pathways is an important way to diversify the demographics of the teacher workforce. These new entry routes may appeal to individuals who do not have a “typical” teacher profile. Nationally, the teacher labor force is made up of predominantly white females: Three out of four elementary and secondary school teachers are women, and eight out of ten are white.\(^5\) While no national study of all early-entry certification routes exists, many empirical studies provide insight into the types of candidates some early-entry programs are attracting.

**Gender**

Women have made up the overwhelming majority of the teacher workforce over the past half century. One hope of early-entry routes
is that they may attract more men into the profession. Recent research indicates that assignment to a same-gender teacher significantly improves the achievement of boys and girls. Some recent empirical studies confirm that, in fact, early-entry programs are attracting more men into teaching. For instance, Feistritzer conducted a survey of 2,647 teachers entering teaching through early-entry routes in Florida and Texas, as well as a sample of candidates in the Troops to Teachers program (TTT), the Milwaukee Teacher Education Center program (MTEC), and the New York City Teaching Fellows (NYCTF) program. In her survey, Feistritzer found that 37 percent of the early-entry candidate population was male, well above the national average of 25 percent. It is possible that the low overall survey response rate and the inclusion of the TTT program in her sample, however, affect the averages she reports.

Research on individuals preparing for teaching in the New York City area by pathway and by program also found more men entering through early-entry routes. Of the participants in the two early-entry programs surveyed in NYC, Teach for America (TFA) and New York City Teaching Fellows (NYCTF), men made up 30 and 31 percent of the candidates, respectively, as compared to 22 percent in the traditional graduate programs, and only 7 percent in the traditional undergraduate programs.

On the other hand, not all data from recent empirical studies find more men entering through early-entry routes. Humphrey and Wechsler studied a sample of participants in seven early-entry certification programs and found that, on average, these programs attract the same proportion of males and females as currently exist in the national labor market: “about three-quarters of participants are women, a number consistent with the national average for all teachers.” However, they also call attention to the substantial variation by program. TFA, for instance, tends to attract more male participants, and Humphrey and Wechsler note that men account
for up to 43 percent of the participants in the New Jersey Provisional Teacher Program. On the other hand, they find that only 34 percent of those in the Texas Region XIII program are male.

Data collected almost fifteen years ago suggests a similar finding. In her analysis of the 1993–94 Schools and Staffing Survey (SASS), Shen also finds little difference in gender between traditionally and early-entry-certified teachers. According to Shen, 24 percent of traditionally certified teachers were male, while men made up 26 percent of the early-entry-certified teachers.\(^\text{12}\)

In sum, the research does not consistently suggest that there are more male teachers in early-entry pathways. While some recent evidence suggests that there are more men, other research calls attention to significant variation across programs. However, because there are still few studies that examine the gender of entrants across many different pathways, as well as within early-entry programs, it is difficult to draw firm conclusions as to whether early-entry programs are attracting more men into teaching.

**Race and Ethnicity**

The racial and ethnic composition of the teacher workforce is quite different than that of the student population. While only 17 percent of teachers are nonwhite, over 40 percent of elementary and secondary students are nonwhite.\(^\text{13}\) This lack of minority teachers may have important consequences for minority student learning. Using data from the Tennessee STAR class-size experiment, Thomas Dee finds that random assignment to a racially similar teacher improved the test scores of both black and white students.\(^\text{14}\) Educators interested in diversifying the workforce to help address the lack of minority teachers have argued that early-entry routes may appeal in particular to teachers of color who may wish to enter the classroom more rapidly, as well as earn a salary during preparation.
Some research does suggest that early-entry programs do attract a greater proportion of teachers of color. For instance, in New York City, while the majority of all participants in teacher-preparation programs in 2003–04 were white, the early-entry pathways did have higher percentages of teachers of color. In both TFA and the NYCTF, slightly over half of the candidates were white (58 percent and 56 percent, respectively), while 67 and 63 percent (respectively) of traditional undergraduate and graduate certification candidates were white. In the NYCTF program, 15 percent of participants were African American, and 12 percent were Hispanic. And, in TFA, 8 percent were African American, 10 percent Hispanic, and 25 percent “other.” Feistritzer also found in her sample that 32 percent of early-entry certification candidates were nonwhite, and even more (37%) of the candidates in her sample of Troops to Teachers were teachers of color. In her TTT sample, she found that almost one-quarter of the teachers were black and 9 percent were Hispanic.

Similarly, Humphrey and Wechsler found that for all seven early-entry programs they studied, minority teachers made up 40 percent of participants. However, Humphrey and Wechsler also call attention again to variations that exist across the programs, suggesting that the differences may reflect the local teacher labor market. For example,

. . . about 36 percent of the Texas Region XIII participants are African American or Hispanic. Although higher than the national average, that percentage is just slightly more than the 29 percent of teachers in Austin (the largest district served by the Region XIII program) who are African American or Hispanic.

They also mention that one program, Milwaukee’s Metropolitan Multicultural Teacher Education Program (MMTEP), stood out, with 80 percent of participants who are people of color. They
explain that not only was this the highest percentage of the seven programs they studied, but it was also substantially higher than the proportion of teachers of color in the Milwaukee Public Schools. This may be explained, they say, by the fact that one of the program’s primary goals was to recruit and prepare teachers of color.

The existing evidence supports the claim that early-entry certification may increase the aggregate percentage of racial minorities who enter the teacher workforce, and programs aimed specifically at minority recruitment, like the MMTEP, can be very successful. Even in the cases where the composition of the local labor market has an above-average percentage of minority teachers, the profile of those candidates coming from the early-entry pathways mirrors, if not exceeds, the local conditions. However, as with gender, the evidence also suggests variation by program and labor market, in that some programs in some state contexts stood out as having many more candidates of color than others.

Age

Another belief about early-entry routes is that they may attract older individuals into teaching, hence bringing a level of maturity, sense of responsibility, and commitment that younger individuals may not yet have. Data from the 1999–2000 and the 2003–04 SASS indicates that the average age of beginning teachers in the U.S. is twenty-nine years old. Given that more and more young adults expect to have more than one career in their lifetime, some have argued that older adults who may now be seeking a second career represent a promising population from which to recruit new teachers.

Some reports on early-entry certification candidates do suggest that early-entry candidates are indeed slightly older than the average beginning teacher. Feistritzer found that of the early-entry pro-
gram participants she surveyed, 72 percent were age thirty or older, 47 percent were forty and older, and 20 percent were older than fifty. However, Feistritzer does not provide an analysis of the age breakdown by program, and other studies suggest that there may be significant variation in age across different early-entry certification programs.

Humphrey and Wechsler found that the participants in the seven early-entry certification programs they studied were, on average, approximately thirty-two years of age. However, they also noted that participants’ ages varied greatly across programs. Participants in TFA, for example, were substantially younger than the national average, while participants in other programs, such as North Carolina’s NC TEACH and MMTEP, were older. They attribute the variation in age, in part, to program recruiting practices: “TFA targets recent college graduates from selective universities, whereas MMTEP focuses on applicants with classroom experience and admits only those who have at least one year of experience as a teacher’s assistant.”

In New York City, the results confirm such variation among early-entry certification programs. However, the results also suggest, surprisingly, that early-entry pathways do not necessarily attract candidates older than those in traditional teaching programs. For instance, in an analysis of our survey of 2,048 participants from traditional programs and from Teach for America and the New York City Teaching Fellows during the 2003–04 academic year, we found that participants in Teach For America were, in fact, the youngest of all the participants, averaging twenty-two years. Surprisingly, TFA candidates were even younger than students in the traditional undergraduate programs, whose average age was twenty-three. The New York City Teaching Fellows were older than TFA candidates, averaging twenty-eight years of age. However, also unexpectedly, we found that the oldest students in our sample were
not those in early-entry pathways, but rather the students in traditional graduate programs, whose average age was thirty.

Research from the past seems consistent with some of the current findings that suggest early-entry pathways may not attract an older population. In her analysis of the 1993–94 SASS survey, Shen found a larger number of younger teachers in the early-entry-certified sample, while there were more teachers over age fifty in the traditionally certified sample. Shen concludes, in fact, that early-entry certification programs were unsuccessful in meeting their goal of bringing older teachers into the workforce.

In sum, the results do not consistently suggest that participants in early-entry certification programs are older. Rather, the age of candidates seems to vary by program, and actually, some results across the last fifteen years suggest that traditional programs, not early-entry programs, may attract older participants. This may, however, be due to the fact that a number of alternative programs—particularly the well-known or national ones, such as TFA—specifically target recent college graduates. So it may not be that older individuals prefer traditional programs, but, rather, that many of the alternative programs are not designed to recruit them.

At the same time, it is important to note that whether older candidates represent a preferable population from which to recruit remains an empirical question. While some argue that older candidates may bring maturity, responsibility, and commitment to the field, others have noted that older candidates could just as well be less reliable and responsible, having left prior careers for new ones. Furthermore, whether older individuals bring an increased level of experience, expertise, and content knowledge also remains underexplored.
BUNDLES OF CHARACTERISTICS OR CATEGORIES

While it is useful to examine specific aspects of early-entry candidates, such as age or gender or race, it is also possible that there are other ways of characterizing these participants that move beyond discrete descriptive data. Some research has focused upon developing “profiles” of early-entry candidates that will shed light upon sets of features that seem to characterize groups of participants, in order to better understand the motivations, perceptions of teaching, and plans for the future that these groups might bring to teaching.27

For instance, Crow, Levine, and Nager examined patterns among teachers’ perceptions of teaching, beliefs about their past work, and the degree to which the candidates still identified with that prior work.28 They found that three patterns seemed to characterize their participants. They named the first group *homecomers*, arguing that for them, the term “career changer” seemed a bit inaccurate, as they had not necessarily pursued a true “career” prior to becoming a teacher. However, these teachers felt as if they had always dreamed of being a teacher, and for them, teaching represented a kind of psychological homecoming. The second group, which they call *the converted*, consisted of participants who did not seriously consider teaching “until some pivotal event or confluence of factors caused them to reconsider professional plans.” They labeled the last group *the unconverted*, describing them as having achieved high status (like the converted) in other occupations, but who did not feel, after having tried teaching, that it was the right occupation for them; this group did not plan to remain in teaching. This study was conducted with a small sample of individuals in one teacher-education program designed for mid-career entrants, and understanding more about the degree to which different early-entry candidates may fall into these categories would be useful for recruitment and preparation.
ATTITUDES ABOUT THE PROFESSION AND THE WORK OF TEACHING

Chin and Young characterized early-entry teachers by their perspective on teaching and professional careers. They described the teachers they studied not by specific demographic features, but rather by the broader categories that seemed to capture their approaches to work and to teaching. They found that their sample of early-entry teachers fell into six groups, which they termed: career changers, socially committed, compatible life-stylists, working-class activists, romantic idealists, and career explorers. To some degree, the composition of these groups differed by race, gender, and ethnicity, suggesting that these kinds of groupings could be useful in understanding these types of teacher candidates, as well as understanding their motivations and beliefs about teaching. This knowledge could be particularly valuable in recruiting a more-diverse pool of teachers.

Similarly, Johnson and her colleagues draw upon data from interviews and surveys with fifty new teachers (both mid-career and first-career entrants) who entered teaching through early-entry and traditional certification pathways. They identify two orientations toward the profession, expressed by teachers in both pathways. One group, whom they termed explorers, was not sure about whether or not they would stay in teaching (although they might, given good conditions and appropriate rewards). The second, whom they termed contributors, saw teaching as one, but not the only, way to make a contribution to society. The researchers emphasize that these groups of teachers did not consider teaching a trivial pursuit and intended to teach with passion, commitment, and serious effort—but planned to do so only for a short time. Understanding more about which populations of teachers take these approaches to the teaching profession could be particularly useful in designing targeted recruitment or induction programs.
Another, broader category that often comes up in discussions of early-entry certification is that of “mid-career entrant” or “career changer.” Some educators and policymakers have argued that there is a population of professionals eager to teach but who may be dissuaded from actually becoming a teacher by the burdensome requirements of traditional teacher education; and that early-entry programs represent an attractive alternative that would appeal to such candidates. These candidates would use early-entry certification programs to switch from a professional career such as law or engineering into teaching, bringing with them the strong content-area knowledge accumulated in their previous careers. Yet it is important to know whether in fact substantial numbers of these candidates exist and whether they should remain a central focus of policy efforts to recruit them.

Some researchers have argued that there is a fair amount of evidence that early-entry programs do bring more mid-career entrants into teaching. In the recent past, Shen concluded that there were more candidates entering as mid-career entrants in early-entry programs than in traditional programs. Others who studied this phenomenon seem to agree: Ruenzel, who looked at statewide data in California, and Chin, Young, and Floyd, who studied an early-entry program in California, found entrants in the program to have an average age of thirty-five. Feistritzer’s data also showed that 72 percent of entrants were over thirty. Johnson argues that there are a growing number of older or mid-career entrants choosing teaching as a profession, and that they should be considered in policy discussions.

However, while these researchers do provide evidence of a growing number of older entrants, they do not have data on the prior occupations of these entrants; therefore, we cannot assume these candidates come from professional careers. Furthermore, they can
only infer that these mid-career entrants come through early-entry routes, as they do not have data providing evidence of the type of preparation these teachers selected. Finally, it is important to note that this data infers entrants are “career changers” based upon their age of entry, and a high age may, in fact, simply indicate a longer undergraduate career, or that candidates have pursued different positions or careers, or an absence from paid work in the labor market. In that case, it may not be appropriate to term these candidates “career changers,” and may be more useful to categorize them in some other way that might better capture their previous work history.

Indeed, a recent review of the literature on older entrants into teaching raises questions about the notion of the “mid-career” or “second-career” teacher, and in particular, points to assumptions regarding age and work experience in much research on older entrants. Hammerness found that it is not entirely clear how many true mid-career entrants exist, nor whether early-entry programs adequately recruit such candidates. While this review found a number of studies that suggested older candidates are entering teaching through alternative routes, little evidence exists to suggest that large numbers of these candidates are in fact professionals seeking a true “second career.” Rather, the candidates seemed to fall into three categories: The first consisted of fairly recent graduates, some even still in their mid-twenties, who have not yet settled on a career but did not enter teaching right out of college/university. The second consisted of candidates in their thirties and forties. Within this group, some are well-trained men and women who have pursued a prior career, such as law, medicine, or engineering, and have chosen to pursue teaching as a second career. However, others have pursued more than one occupation before settling upon teaching. Still others may have had an administrative or clerical position, but not a professional position for which prior train-
ing or graduate preparation was required. For some of the candidates in this group, teaching may in fact represent an increase in salary and professional status as opposed to a step down.

The third group represents those candidates in their fifties or sixties who may be at the end of a career, and are seeking a new position in retirement. However, research has not yet been able to determine with certainty how many of these different candidates exist, which might be most desirable in teaching, nor their motivations and plans for teaching. The notion of the mid-career candidate needs far greater elaboration and understanding.

Indeed, Humphrey and Wechsler note that in their sample of early-entry candidates, even though there were many mid-career changers in their sample,

relatively few participants switched from careers in mathematics and science to teaching (about 5 percent). Only 2 percent came from the legal profession, and 6 percent 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 early entry certification program.

And, although they note that many advocates of mid-career entrants argue that there are those willing to take pay cuts to become teachers, they found few in their sample who actually took such cuts, reporting that “59 percent of participants in fact received a pay raise by becoming teachers.”

In our New York sample, we, too, found that the early-entry pathways did not necessarily attract a sample of teachers who had substantial professional experience outside of education. In fact, the mean experience in a professional position outside of education was almost exactly the same for both traditional graduate participants and for the Teaching Fellows, with the traditional graduates actually reporting slightly more experience.
In sum, examining early-entry candidates’ profiles and backgrounds may be a particularly important development in research on early-entry pathways. Understanding the kinds of motivations, beliefs about teaching, and plans for the future could be especially useful in designing appropriate incentives, preparation, and support that could attract different populations of potential teachers. However, much more research needs to be conducted in this area—particularly in order to move beyond designations such as “mid-career entrant” that still do not fully capture the range of backgrounds, work experiences, and motivations of different groups of candidates for teaching.

WHAT QUALIFICATIONS DO EARLY ENTRANTS BRING TO TEACHING?

Another key policy question concerns the kind of qualifications and previous experiences early-entry teachers bring to teaching. Some have argued that early-entry candidates bring subject-area expertise and strong content knowledge, while others suggest that this may not be the case. In this section, we shed light upon what is known about the kinds of qualifications—the academic backgrounds, the subject-area expertise, previous work experiences and experiences with children, and additional knowledge of languages—that these individuals may bring to teaching, and how they may differ from those of teachers who come to teaching through more traditional pathways.

Academic Background

Advocates of early-entry certification have frequently argued that these pathways and programs could attract an academically better-prepared population, who might otherwise be discouraged by
the lower status of education courses and schools and the perception of such programs as less academically engaging. Such arguments also emphasize the notion that those who have previously completed bachelor’s degrees in fields other than education may not be willing to put time or effort into additional training, and that early-entry pathways may be of particular appeal to those potential teachers. A number of common measures are used to capture the academic effectiveness of teachers, including: highest level of education, selectivity of undergraduate institution, and content knowledge as measured by college subject-area majors. However, empirical research demonstrates that only some of these characteristics have been linked to effective teaching. In a review of the literature, Loeb and Reininger highlight a number of studies that have found student achievement improves more in classes in which the teachers have higher test scores or have attended selective undergraduate institutions. Other studies have found that greater content knowledge for high school teachers also improves student outcomes. Interestingly, even though nearly half of all teachers have earned master’s degrees, there is no evidence that having a master’s degree improves a teacher’s ability in the classroom.

In Humphrey and Wechsler’s study of seven early-entry certification programs, they did find that, overall, early-entry-route teachers are more likely to have graduated from competitive institutions of higher education than from noncompetitive ones. However, they also found substantial variation in the selectivity of the colleges attended by the program participants. For instance, in their sample, the percentage of early-entry certification participants attending a competitive college ranged from 79 percent (TFA participants) to 6 percent (MMTEP participants). Given that Teach for America directly targets recruitment efforts at graduates from the most competitive colleges across the country, this is not surpris-
Feistritzer looked at two measures of academic achievement of the early-entry-certified participants in her sample: highest degree earned and area of college major. She found that the percentage of early-entry-certified teachers with a bachelor’s degree in a field other than education was quite high, 57 percent, compared with those with a bachelor’s degree in education, only 3 percent. She also reports that those with a master’s degree made up 37 percent of the sample (of which 19 percent had a master’s in education and 18 percent in fields outside of education). While she does not provide data by program, in another study she reports that of the Troops to Teachers sample, 62 percent held a master’s degree or higher. She found that, of the 2,554 respondents to the question, 23 have a law degree, 8 a medical degree, 27 a doctorate in a field other than education, 5 a doctorate in education, and 86 hold a bachelor’s degree in education as their highest academic degree.

Surveys of teacher candidates in New York City reveal that early-entry-certified teachers have had more math preparation in high school than traditionally certified candidates, but also reveal substantial variation between early-entry programs. Fifty-eight percent of TFA and 42 percent of Teaching Fellows participants had taken calculus in high school, while only 31 and 25 percent of traditionally certified graduate students and undergraduate students respectively had taken calculus in high school. However, limiting the sample to those teachers who are specifically preparing to be mathematics teachers, the two early-entry programs revealed a substantial range when it came to those who had taken calculus in high school: over 90 percent of TFA participants as compared to only 54 percent of Teaching Fellows participants. And, of traditionally certified teachers in our sample who were preparing to teach math,
43 percent of undergraduates and 42 percent of graduates had taken calculus.

Another indicator of educational background is parents’ highest degree. In the New York City sample of early-entry and traditionally certified, we found more differences between programs than within pathways. For example, an equal percentage of participants (about 10 percent in each program) in the New York City Teaching Fellows program, traditional undergraduates, and traditional graduates reported the highest level of parent education was a high school degree. However, TFA participants stood out as outliers in this respect: Only 2 percent of TFA participants reported having parents with high school education as their highest degree.

It does appear that some early-entry pathways are attracting a more highly academically credentialed pool of teachers, but overall the existing research suggests that the bulk of the variation in a teacher’s academic background exists between programs, and is not completely differentiated along pathway distinctions. Somewhat surprisingly, given the emphasis upon the subject-area expertise possessed by early-entry candidates—and older entrants in particular—there are no studies of early-entry mid-career candidates’ content knowledge or subject backgrounds.46

**Previous Work Experience and Work with Children**

Of the many reasons for policymakers and educators’ interest in attracting early-entry candidates into teaching, the perception that these candidates may have important skills and work experiences remains one of the most important. For instance, Johnson et al., who studied a sample of mid-career and first-career teachers in Massachusetts, found that their sample of twenty-four mid-career teachers—many of whom entered through early-entry programs—did have substantial work experiences.47 They note that their sample
brought with them a familiarity with large and small organizations, for-profit and non-profit enterprises, entrepreneurial and bureaucratic settings. Some had worked for multiple supervisors, whereas others had been supervisors themselves. They worked freelance or led teams. Some experienced well-defined, progressive on the job training, and some devised training for other employees.

On the other hand, other recent research has found few early-entry candidates with degrees in law or business, and with professional experience. Furthermore, several studies found that a number of early-entry candidates received a pay raise when moving into teaching. This finding underscores the fact that the assumption that all early-entry candidates come from high-paying, high-status professional experiences may be mistaken—given that some candidates, in fact, had prior positions that paid less than a teaching salary. Of course, it is worth noting that at least some of these participants in the Humphrey and Wechsler study had been teachers’ aides and support staff in schools and were entering from paraprofessional programs. Past research confirms that early-entry candidates vary in terms of the nature of their prior work, some candidates coming from clerical or support positions as opposed to professional positions.

Then again, although Feistritzer suggests that fewer in her sample may have been in professional positions, her research also suggests that more of those candidates had classroom experience. While she found that about 20 percent were in what she referred to as a “professional” occupation, 27 percent had been in a teaching-related job (such as a substitute teacher, or preschool teacher). Indeed, critics of poor-quality early-entry routes to teaching often point to candidates’ lack of prior classroom experience and background in child development as shortcomings that result in under-prepared teachers. However, Johnson and colleagues contend that
older entrants potentially have more firsthand understanding of children’s development due to the experience of having had their own children.\textsuperscript{52}

Despite the potential importance candidates’ experience in schools and with children could have for teaching, only a few studies exist that directly examine the level of experience early-entry candidates have had in schools and with children. Of those, Humphrey and Wechsler found that many of their early-entry certification teachers had experience in classrooms before beginning the certification programs.\textsuperscript{53} More than one-third of the participants in three of the programs they studied had worked as classroom teachers, substitutes, or teacher’s aides at some time in their careers. They also add that, in five of the seven programs, more than 60 percent of their participants report some previous classroom experience. Again, the experience varied by program, yet across all programs, participants seemed to have had more experiences with children and in classrooms than expected. They report:

New Jersey’s Provisional Teacher Program attracted the largest number of participants with prior teaching experience. Half of the participants had an average of 39 months of teaching experience. For some, the duration of their prior experience may be related to the timing of their participation in the program. Specifically, some participants had started teaching, but could not attend program classes because of paperwork delays at the New Jersey State Department of Education. Further, while only 14 percent of New York City Teaching Fellows had prior experience as a classroom teacher, those participants had an average of 40 months of teaching experience.\textsuperscript{54}

When the New York City Pathways study researchers gathered information from candidates about their previous work experiences, they surveyed both early-entry candidates and traditional candidates, allowing for a comparison between the two groups. In
terms of previous teaching experience, the results show that those in traditional programs were more likely to have previous teaching experience (such as a full-time teacher, preschool teacher, or a substitute teacher) than the early-entry candidates. However, those within the early-entry programs did indicate they had more experience working with low-income children in urban settings prior to beginning their certification program than those in the traditional programs. The participants in the traditional graduate and Teaching Fellows programs had, on average, more experience working in professional positions both within and outside of the field of education than the younger undergraduate and TFA candidates, which may likely be a result of their older age.

In contradiction to many critics who worry that early-entry certification teachers are inexperienced and untrained with regard to children and schools, several of these large studies do suggest that these teachers bring some previous classroom experience with children. However, few of the studies looked specifically at the nature of the student populations with which the candidates worked. Given a recent study by Public Agenda which found that 64 percent of new teachers from early-entry pathways (as compared to 41 percent of traditionally trained new entrants) felt they were placed in schools with children who were described as “the hardest to reach,” knowing whether the candidates have any past experience with such children could be extremely useful.

In sum, it seems possible that early entrants may have more experience in schools and with children than has been assumed. On the other hand, more research needs to be pursued in order to understand the nature of the experiences these entrants have had in education, and with particular populations of students, as well as what role their own experiences (if any) as parents may play.
Knowledge of Languages

Accompanying the growing racial and ethnic diversity of the student population is the rapid expansion of the number of students who are classified as English-language learners (ELLs). Teachers who are fluent in languages other than English may have the advantage of being able to talk with students and their families in the native language of the family as well as acting as a resource for their schools. By bringing in teachers with more language diversity, early-entry routes may be helping to fill an unmet need of many students, families, and schools.

Natriello and Zumwalt found that early-entry certification candidates in New Jersey were more likely to speak a language other than English. Similarly, more recent survey results from teacher candidates in NYC suggest that early-entry pathways are increasing the language diversity of teachers. Preservice teacher candidates were asked if they spoke another language besides English fluently, and 41 percent of those in TFA and 35 percent of NYC Teaching Fellows indicated they did. Of the candidates in traditional certification programs, 32 percent of undergraduates and only one-quarter of candidates in the graduate programs indicated they spoke another language fluently. While these studies suggest that early-entry pathways could be bringing in individuals with more language and racial diversity, more work in this area needs to be pursued.

WHAT FACTORS LED CANDIDATES TO CONSIDER AN EARLY-ENTRY ROUTE?

Proponents claim key factors that attract candidates into early-entry programs include shortened preparation time, quick entry into the classroom, and convenience of the program. But the question remains as to whether candidates themselves report those factors as being important. Or are other factors, including the ability to earn
an income while attending school, at play? In this section, we address these questions as well as the key issue: whether these entrants might have used a more traditional pathway if these early-entry programs did not exist.

When asked about the factors that were most important in selecting an early-entry certification program, data from multiple studies suggest that individuals emphasize the importance of financial cost, length of time, and convenience. For example, in a report specifically focused upon early-entry certification programs and participants in four states (Connecticut, Massachusetts, California, and Louisiana), Johnson and her colleagues found that a similar series of characteristics appealed to the participants. Data interviews with eighty participants in these programs suggested that they appreciated the fact that the programs offered “faster, less expensive, more practical, and more convenient training, sometimes with the promise of job placement.”

Feistritzer reports similar findings. She finds that variables respondents rated as very important in choosing an alternate route to teacher certification included: receiving a teacher’s salary and benefits (76%); being able to teach while getting certified (73%); out-of-pocket costs (57%); and length of program (57%). Interestingly, the variables that ranked highest in the not at all important category in Feistritzer’s survey were: being able to get a master’s degree (26%); guidance from college faculty (21%); and being able to go through the program in a cohort (17%).

Our results from NYC echo these sentiments as well. Candidates in early-entry certification pathways place high importance on ease of transition into teaching, low cost of the program, and ability to sustain a steady income; however, a more detailed look at the responses reveals interesting variation between pathways. On a survey in which traditional and early-entry respondents were asked to indicate the top three reasons, from a list of twenty-four, that
were most important for the selection of their teacher-education program, significant differences were found to exist between those in the TFA program and the NYC Teaching Fellows programs. The top reasons reported by those in the NYCTF program include ease of transition from a non-teaching career, ability to sustain a steady income, and low tuition, while the top reasons given by TFA respondents include program’s mission, program reputation, and intellectual challenge. Comparing across early-entry and traditional pathways shows that those in the traditional programs rank items similar to those in the Teaching Fellows program as the most important for their program choice, including low tuition, ease of transition from a non-teaching career, and flexibility of classes. Clearly, however, the population of candidates who select a program such as Teach for America may find different factors important—and the importance of program aims and goals, reputation, and intellectual challenge is a set of factors not often recognized in the design of early-entry programs.

A few studies have looked at the role of these particular factors in alternative teachers’ decisionmaking in more depth. For instance, in light of policymakers’ attempts to address candidates’ potential concerns about salary loss or other financial issues, some studies have examined the role that monetary incentives—such as signing bonuses, grants, and stipends—play in candidates’ decisionmaking. Two studies have examined the impact of signing bonuses offered by the Massachusetts Initiative for New Teachers (MINT) program, which included an unprecedented $20,000 signing bonus.60 In their study of thirteen individuals entering teaching through this program, Johnson and Liu found that the chance to avoid the “opportunity costs” of loss of income coupled with the potential out-of-pocket costs for tuition, was much more important to the participants than the signing bonus.61 While this may seem surprising, Johnson and Liu argue that in fact, the opportu-
nity costs could have greatly exceeded the $20,000 amount they received as a bonus. As they contend, “the bonus money itself was a relatively weak incentive. A much more powerful extrinsic incentive, according to virtually all participants, was the program’s accelerated route to certification.” Indeed, they found that while the bonuses helped make some teachers’ transitions to teaching easier, ultimately, they played “virtually no role” in teachers’ decisions about whether or not to remain in the profession. Rather, the single most important influence was the “intrinsic rewards of teaching and the respondents’ success in realizing them.” Relatedly, a recent survey conducted by Public Agenda with new teachers from three alternative routes (Teach for America, the New Teachers Project, and Troops to Teachers) suggested that the majority (71%) of new teachers from alternative routes surveyed “say they would rather work in a school where ‘administrators gave strong backing and support’ compared with a school where they could earn more.”

Finally, one key critique of early-entry route programs is that they are diverting individuals who would otherwise obtain more substantial and thorough preparation through traditional pathways. Few large studies have attempted to determine whether this is in fact the case or if these early-entry routes are actually attracting individuals who would not otherwise have chosen to enter teaching. In our survey of teacher-preparation candidates in NYC, we find that very few of the early-entry candidates—only 8 percent of TFA candidates and 8 percent of NYCTF candidates—had also applied to traditional teacher-preparation programs, suggesting that the early-entry routes are attracting a different pool of teachers. We found that approximately one-fifth of individuals in traditional programs had also applied to early-entry programs, suggesting that there is a larger pool of traditional candidates who would have liked to attend the alternative routes but were not accepted.
Feistritzer suggests that nearly half, 47 percent, would not have chosen to teach if they had not had an early-entry route available to them, and 25 percent of her sample indicated that they were not sure.\textsuperscript{65} Less than one-quarter of her sample said they would have gone back to college and completed a traditional teacher-education program, and 6 percent would have found a job in a private school or in a setting in which they would not have to be certified.

Feistritzer also reports differences in this response by age, gender, and race. She suggests that the older one is, the less likely one is to enter teaching if an early-entry route is not available—lending credence to the argument that early-entry routes may be particularly appealing to older candidates:

Nearly six out of 10 of those surveyed who were in their 50s or older when they entered an alternate route say they would not have become a teacher if an alternate route had not been available. Half of those in their 40s, 46 percent of those in their 30s and 45 percent of those in their 20s report they would not have become teachers if an alternate route had not been available. More than half of men entering teaching through alternate routes, compared to 45 percent of women, say they would not have become a teacher if an alternate route had not been available.\textsuperscript{66}

She also reports that more candidates of color suggest they would not enter teaching if it were not for the opportunity to pursue a credential through an alternative route, noting that 53 percent of Hispanic teachers say they would not have become a teacher if an alternate route had not been available, compared to 48 percent of whites and 43 percent of African Americans. This finding suggests that early-entry pathways may attract a more diverse candidate into teaching than traditional pathways.

These studies do suggest a distinct attraction to early-entry programs for particular candidates. In addition, the appeal of alterna-
tive routes seems to rest upon convenience, ease of transition into teaching, and low costs. However, it is also important to note exceptions such as the TFA candidates in New York who were more persuaded by the reputation, program goals, and the potential for intellectual challenge, again suggesting the range of differences in populations of early-entry teachers. In addition, some studies suggest that bonuses are less important to some candidates than the opportunity to defray the costs of tuition and loss of salary. Finally, the current research also indicates that most early-entry candidates would not have chosen traditional routes, suggesting that the concern that these new routes into teaching pull candidates away from traditional programs may be unfounded.

WHERE ARE EARLY-ENTRY CANDIDATES CHOOSING TO TEACH?

According to the National Center for Education Statistics, of the twenty-two states that collect data on the types of communities where their early-entry participants teach, five states report that over 50 percent of their early-entry certification candidates teach in inner-city communities (California, District of Columbia, Maryland, Missouri, New York, Texas, and Utah). Four states report that over 30 percent of their participants teach in small towns (Montana, Oklahoma, Oregon, and Texas). Only two states reported that over 30 percent of graduates teach in rural areas: Wyoming (100%) and Montana (50%). However, the remaining states did report a range of 2 to 21 percent of graduates choosing to teach in rural areas. Interestingly, eight states reported more than 30 percent of their graduates from early-entry programs were in suburban communities: Connecticut, Delaware, Maryland, Mississippi, Oklahoma, Oregon, Utah, and Vermont.
Feistritzer’s study finds that many of the early-entry route respondents are teaching in large cities. Half of survey respondents report they are teaching in a large city, 16 percent in a medium-sized city, 10 percent in a suburban area outside a central city, 10 percent in a small city, 8 percent in a rural area, and 6 percent in a small town. Feistritzer suggests that early-entry certification candidates are much more likely to teach in a big city, noting:

These results are compared to 14 percent of all teachers who teach in a large city and 15 percent who teach in a medium city, 15 percent in the suburbs, 13 percent in a small city, 17 percent in a small town and 26 percent in a rural area, according to survey now under way by the National Center for Education Information.

She also reports that early-entry respondents in her sample are somewhat more willing to move within their state to a place where the demand for teaching is the greatest:

Individuals entering teaching through alternate routes are slightly more inclined to move within state to teach where the demand for jobs is greatest than they are to move out of state. Thirty-one percent say that it is very likely or somewhat likely that they would move to a rural area within the state if demand for teachers were great; 36 percent say it is very likely or somewhat likely that they would move to a large metropolitan area within the state. Thirty-one percent indicate they would be very or somewhat likely to move to a metropolitan area out of state and 22 percent say they would be very or somewhat likely to move to a rural area out of state if the demand for teachers warranted such a move.

With regard to TTT, Feistritzer reports that more than half of them are teaching in large cities (55%) or medium cities (31%).
On the other hand, not all studies find that early-entry candidates end up teaching in the communities that need those teachers the most. For instance, Fowler, who studied the MINT program, found that less than half of the two thousand candidates recruited chose to teach in the thirteen high-needs districts targeted by the state. He concluded that the program did not meet its goals of recruiting and retaining highly qualified teachers for the high-needs communities.

Recent research suggests that geography matters to new teachers, and this finding has important implications for recruiting early entrants as well as to where they may choose to teach after completing their programs. These studies have helped illuminate the role that geography can play in teachers’ choices of where to teach. Work by Boyd, Lankford, Loeb, and Wyckoff reveals that most teachers in New York State take jobs very close to their hometowns (the towns in which they attended high school). They found that 61 percent of teachers entering teaching from 1999–2002 took a job within only fifteen miles of their hometown. Eighty-five percent took jobs within forty miles of their hometowns. These findings held true for both older teachers (born before 1963) and younger teachers (84.6% and 84.8% respectively). Similarly, Reininger finds that these patterns are not unique to New York and hold up on a national level as well. Relatedly, Johnson and colleagues found that one of the major draws candidates described regarding early-entry programs was the relative convenience of the program—the degree to which the program was designed to be close to where candidates lived and worked. However, not all studies consistently find that teachers prefer to remain close to their roots. For instance, Feistritzer found that nearly two-thirds of the candidates in her sample were not teaching within 150 miles of where they were born.
CONCLUSIONS AND POLICY IMPLICATIONS

This review of the current literature on early-entry candidates and programs suggests that early entrants are a different population than those entering through traditional pathways. Indeed, it seems that many candidates who selected early-entry programs may have not entered teaching had early-entry programs not been available. These findings are particularly important in that they allay concerns that early-entry pathways could be pulling candidates away from traditional routes into teaching.

This review also suggests that in some key ways, early-entry pathways have been able to recruit the kinds of individuals into teaching that they have been designed to attract. For instance, current research suggests that these candidates are not only more diverse, but may also be slightly more likely to be male, than those candidates who enter teaching through more-traditional programs and pathways. Two studies also suggested that these candidates bring more linguistic diversity than traditional candidates; however, this characteristic has rarely been examined in research on early entrants. The research also suggests that these candidates may also be more likely to bring some unexpected and useful qualifications in terms of specific teaching and classroom experiences, than has been previously assumed.

On the other hand, our review does not suggest that early-entry programs consistently attract a more highly academically prepared individual. Nor is it clear that these candidates bring stronger subject-matter background or more substantial work experience (although research on these candidates’ subject-matter knowledge and background is particularly thin). Thus, while early-entry programs are attracting some candidates with some highly sought qualifications, in some substantial ways they have failed to attract candidates with the most desirable mix of academic preparation, prior skills, work experience, expertise, and content knowledge.
However, some important exceptions exist. Programs that aim to recruit specific populations of teachers seem particularly effective in obtaining particular kinds of individuals. For instance, programs that were designed to appeal to elite, high-achieving students from strong academic institutions (such as Teach for America) did obtain candidates with such backgrounds. Programs such as MMTEP aimed at paraprofessionals who were already working within the public school system obtained candidates who had experience in the local school system, and planned to remain teaching in the system. Indeed, targeting populations of candidates seems to represent an effective strategy for such programs. However, research done by Johnson and her colleagues found that not all early-entry programs are as purposeful in their recruitment, and hence, the candidates in their programs may represent a much broader range in terms of their commitments, background, and prior educational preparation.

Our review suggests that the economics of preparation and teaching are key factors in candidates’ decision to enter through an early-entry program. Efforts to keep tuition low and to alleviate some of the opportunity costs of teaching are particularly important features that appealed to many candidates. Interestingly, some of the research suggests that signing bonuses and other one-time incentives may be less important to candidates than assistance with the costs of preparation, such as tuition fees and the loss of salary (as well as the loss of future salary increases). However, some candidates expressed very different factors in their decisionmaking—for instance, the TFA candidates in New York described choosing the program based on its reputation, goals, and intellectual challenge—again underscoring the differences within the population of early-entry teachers.

In sum, our research suggests that early-entry programs have not been completely successful in recruiting the kind of individ-
uals most hoped for to these programs. While the programs do seem to attract a slightly more diverse population, it seems possible that early-entry programs could be more purposeful in this regard. And, while some programs attract highly academically prepared candidates, not all do so as successfully. And finally, not all programs seem as effective in appealing to true mid-career, professional candidates.

This suggests several implications for those teacher educators who are responsible for early-entry programs, and for policymakers interested in those programs. Because programs that are clear about the kinds of candidates they seek seem to be able to get them, this research suggests that in order to be more effective, early-entry programs should design targeted recruitment efforts. To capitalize upon the interests of new teachers in entering nearby programs and teaching close to home, early-entry programs should factor in teacher’s preferences for geographic proximity when considering where to recruit and prepare candidates. Furthermore, if teacher educators were to assess the needs of nearby districts, in terms of the specific populations of teachers they seek (such as special education teachers, math or science teachers), teacher educators could more purposefully match local needs. Such directed efforts can assist in much more strategic development and maintenance of local teaching labor markets.

In turn, teacher educators may be able to make use of the recent research on profiles of early-entry candidates that move beyond discrete characteristics, in order to identify potential candidates. Understanding more about the motivations, perceptions of teaching, and future plans of different candidates may be particularly important in developing these more-effective and specific recruitment efforts. For instance, knowing that the population of young college graduates that applies to TFA is heavily influenced by program mission and by the potential intellectual experience
they might have, could help programs that may wish to attract more of such candidates. And, given that TFA reports that it receives 18,000 applications for only 2,900 positions, this pool of candidates may represent a potentially rich source of candidates who could be attracted to other early-entry programs with similar aims and goals.\textsuperscript{81}

Policymakers should help guide teacher educators’ recruitment efforts by supporting schools and districts in determining their specific needs. Furthermore, given that early-entry candidates are in no way a monolithic group, they should help develop and support a broader range of incentives that may appeal to different populations. While they should continue to fund early-entry programs that are low-cost, they could also consider a wider array of incentives, ranging from tuition reimbursement or waivers for younger early-entrant candidates who might be recent college graduates, to assistance with child-care costs or salary loss for those who might be career changers or older entrants with families. Supporting the development of some programs that have strong missions and goals, as well as rich educational content, may also help appeal to the large population of recent graduates who may be considering teaching as a first career. Such efforts may more effectively and purposefully support a broad range of early-entry candidates, helping them address key concerns and giving them a sense of certainty when they choose teaching as a profession.

The authors contributed equally to this chapter.
of teacher education would accept are different, but the support for multiple pathways cuts across the political spectrum.

52. There is also a belief by some that the continued existence of both early-entry and college-recommending pathways into teaching will lead to an effect on college and university programs of including more school-based experiences and an effect on early-entry experiences of including more professional education knowledge in their curricula.


54. See, for example, Linda Darling-Hammond, *Powerful Teacher Education* (San Francisco: Jossey-Bass, 2006).

55. Zeichner and Paige, “The Current Status and Possible Future for ‘Traditional’ College- and University-Based Teacher Education Programs in the U.S.”

56. In 2007 the federal government underfunded “No Child Left Behind” by $15.8 billion and Title 1 by $12.2 billion (available online at http://www.nea.org).

CHAPTER 2

WHO GOES INTO EARLY-ENTRY PROGRAMS?

Karen Hammerness and Michelle Reininger


3. Early-entry pathways and programs designed to attract different populations of teachers have, in fact, been around for more than forty years. For instance, in the 1960s, an early-entry teacher-education program called the Teacher Corps was legislated with the intention of improving the education of “dis-


7. Altogether across all populations, the survey of 2,647 teachers had a response rate of 35 percent. Emily Feistritzer, Profile of Alternative Route Teachers (Washington, DC: National Center for Education Information, 2005).

8. Feistritzer, Profile of Troops to Teachers, focuses on data from the TTT cohort. She notes that 82 percent of the sample are male. The Troops to Teachers sample size was 1,434, with a response rate of 48.4 percent.


10. The programs included in their study were the following: the Teacher Education Institute in Elk Grove (CA) Unified School District, Milwaukee’s Metropolitan Multicultural Teacher Education Program (MMTEP), North Carolina’s NC TEACH, the New Jersey Provisional Teacher Program, the New York City Teaching Fellows Program, Teach for America, and the Texas Region XIII Education Service Center’s Educator Certification Program. It is worth noting that one of the programs, MMTEP, is designed for paraprofessionals, which typically draws upon a different population than other early-entry programs. Daniel C. Humphrey and Marjorie E. Wechsler, “Insights into Alternative Certification: Initial Findings from a National Study,” Teachers College Record, 109, No. 3 (2007): 483–530.


15. “Other” category includes Native American or Alaskan Native, Asian, Native Hawaiian, or multiracial.


19. However, it is important to note that there is no evidence linking a teacher’s age to effective teaching. Age is rather seen as providing insight into the career stage, amount of previous experience, and possible remaining years of employment in the workforce of an individual.


22. Feistritzer, *Profile of Alternative Route Teachers*.

23. Feistritzer, *Profile of Alternative Route Teachers*, conducted an additional analysis of just the Troops to Teachers sample, and found that, in that sample, nine out of ten teachers were over forty years old. Since the TTT teachers made up 16 percent of her overall sample, they may have contributed to a higher overall average.


26. Shen, “Has the Alternative Certification Policy Materialized its Promise? A Comparison between Traditionally and Alternatively Certified Teachers in Public Schools.”


29. Chin and Young, “A Person-Oriented Approach to Characterizing Beginning Teachers in Alternative Certification Programs.”


33. Shen, “Has the Alternative Certification Policy Materialized its Promise? A Comparison between Traditionally and Alternatively Certified Teachers in Public Schools.”


35. Feistritzer, Profile of Alternative Route Teachers.


37. Johnson, Finders and Keepers: Helping New Teachers Survive and Thrive in Our Schools, notes that random sample surveys conducted in 2001–2002 by Project on the Next Generation of Teachers showed an “unexpectedly high proportion of mid-career entrants to teaching: 47 percent in California, 46 percent in Massachusetts, 32 percent in Florida, and 28 percent in Michigan.” However, she also notes that it is not clear whether these high propor-
tions of mid-career entrants are the result of early-entry certification policies or not. On the other hand, the states with larger numbers of mid-career candidates also are states that have given considerable policy efforts to recruit mid-career candidates. Thus, programs especially designed to bring older entrants into teaching, such as the Massachusetts Initiative for New Teachers (MINT), the California Math and Science Teacher Initiative in California, and the Provisional Teacher Program in New Jersey, may have contributed at least in part to increases in older entrants in these states.

40. Finn and Madigan, “Removing the Barriers for Teacher Candidates.”
44. Feistritzer, Profile of Alternative Route Teachers.
45. Feistritzer, Profile of Troops to Teachers.
46. Hammerness, “A First Look at Second Career Teachers.”
48. Feistritzer, Profile of Alternative Route Teachers; Humphrey and Wechsler, “Insights into Alternative Certification: Initial Findings from a National Study.”
51. Feistritzer, Profile of Alternative Route Teachers.
NOTES

57. Feistritzer, Profile of Alternative Route Teachers; Susan Moore Johnson, Finders and Keepers: Helping New Teachers Survive and Thrive in Our Schools.
58. Feistritzer, Profile of Alternative Route Teachers, p. 27.
59. Feistritzer, Profile of Alternative Route Teachers.
65. Feistritzer, Profile of Alternative Route Teachers.
66. Feistritzer, Profile of Alternative Route Teachers, p. 20.
68. Feistritzer, Profile of Alternative Route Teachers.
69. Feistritzer, Profile of Alternative Route Teachers, p. 11.
70. Feistritzer, Profile of Alternative Route Teachers, p. 11.
71. Feistritzer, Profile of Alternative Route Teachers, p. 52.
72. Feistritzer, *Profile of Troops to Teachers*.
76. Reininger, “Teachers’ Location Preferences and the Implications for Schools with Different Student Populations.”
78. Feistritzer, *Profile of Alternative Route Teachers*.

**CHAPTER 3**

**GETTING BEYOND THE LABEL: WHAT CHARACTERIZES ALTERNATIVE CERTIFICATION PROGRAMS?**

*Daniel C. Humphrey and Marjorie E. Wechsler*

3. Items measuring pedagogical content knowledge in reading/language arts and mathematics were drawn from a bank of items developed for the Study of Instructional Improvement being conducted by researchers at the University of Michigan (Deborah Ball, David Cohen, and Brian Rowan, principal