



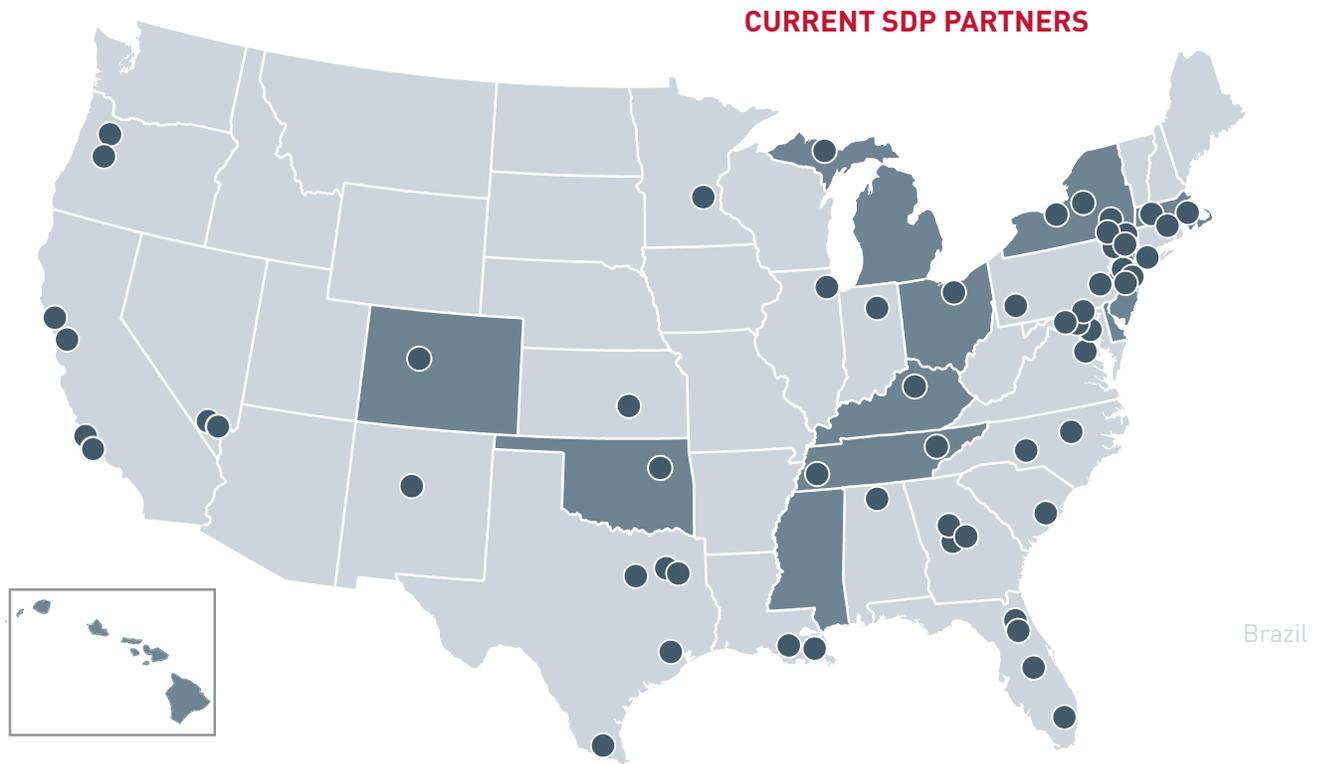
STRATEGIC **DATA** PROJECT

# SDP HUMAN CAPITAL DIAGNOSTIC

New York State Education Department

October 2014





## **THE STRATEGIC DATA PROJECT (SDP)**

Since 2008, SDP has partnered with 75 school districts, charter school networks, state agencies, and nonprofit organizations to bring high-quality research methods and data analysis to bear on strategic management and policy decisions. Our mission is to transform the use of data in education to improve student achievement.

**Part of the Center for Education Policy Research at Harvard University, SDP was formed on two fundamental premises:**

1. Policy and management decisions can directly influence schools' and teachers' ability to improve student achievement.
2. Valid and reliable data analysis significantly improves the quality of decision making.

SDP's theory of action is that if we are able to bring together the right people, assemble the right data, and perform the right analysis, we can help leaders make better decisions—ultimately improving student achievement significantly.

**To make this happen, SDP pursues three strategies:**

1. building a network of top-notch data strategists who serve as fellows for two years with our partners (e.g., school district, charter management organization, nonprofit, or state education agency);
2. conducting rigorous diagnostic analyses of teacher effectiveness and college-going success using agency data; and
3. disseminating our tools, methods, and lessons learned to the education sector broadly.

*The project is supported by the Bill & Melinda Gates Foundation.*

# SDP HUMAN CAPITAL DIAGNOSTIC

## Key Findings

The Strategic Data Project (SDP) partnered with the New York State Education Department (NYSED) in 2012 and 2013 to investigate questions related to teacher preparation, employment, and retention. The key findings from the project are as follows:

- Most graduates of traditional teacher preparation programs at New York colleges and universities do not go on to teach in the state's public schools.<sup>1</sup> Of candidates without prior teaching experience who graduated between 2007 and 2010, 82% received teaching certificates within two years of graduation and 28% were hired to teach in public schools in that same timeframe.
- For graduates of traditional preparation programs, the likelihood of attaining employment as a teacher in New York public schools varied dramatically by certification area. Graduates of elementary and early childhood education programs made up the largest category of certificate recipients but were the least likely to secure teaching assignments in New York public schools. For the 2007 through 2009 cohorts,<sup>2</sup> 16% of elementary and early childhood program graduates without prior teaching experience were hired to teach in that certification area within two years of completing their programs; 12% continued to teach into their second year.
- New teacher candidates who graduated from traditional teacher preparation programs and were certified in NYSED-designated shortage areas, including middle and high school math, science, and special education, were more likely to teach in the state's public and charter schools than those qualified in non-shortage areas. Of middle and secondary math graduates, 49% were employed in New York public schools within two years, as were 56% of science graduates and 62% of middle and secondary special education graduates.
- For new teacher candidates who graduated from traditional elementary and early childhood education programs, holding multiple certificates improved the chances of being hired to teach in New York public schools. Of the 2007 through 2009 cohorts, 21% of elementary and early childhood graduates with one certificate were hired to teach in any subject area within two years, compared with 37% of those with two certificates, and 42% of those with three or more certificates.
- Alternative certification programs were an especially important source of novice teachers in New York City. Of the novices hired by the city's public schools in the 2008 through 2011 school years, one quarter were from alternative programs. Alternatively certified teachers made up 61% of novice middle and secondary special education teachers, 43% of novice science teachers, and 39% of novice math teachers, but only 18% of novice elementary and early childhood teachers.

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## Introduction and Background

In 2012, the Strategic Data Project launched a unique research collaboration with the New York State Education Department. Broadly speaking, the objectives of the partnership were to extend and enhance the state's ongoing research related to teacher preparation, employment, and retention in order to inform policy and practice related to each of these topics.<sup>3</sup> More specifically, the project investigated novice teachers' routes of entry into the profession; the trajectories that graduates of traditional teacher preparation programs follow as they progress along the teacher supply pipeline (i.e., towards formal certification and subsequent employment) and how these pathways differ across teachers' certification areas and teaching assignments; and a subset of similar preparation, certification, and retention analyses in New York City. The findings were intended to inform NYSED's effort to strengthen the quality and cost effectiveness of educator preparation by providing teacher preparation programs with rich data about the extent to which enrollees in their programs go on to graduate, receive certification in high-need subject areas, and secure teaching assignments in hard-to-staff schools. This report highlights the key findings from these analyses.

### Background

NYSED's focus on policies and practices related to educator preparation, performance, and retention are neither new to New York nor uncommon across the country. Rather, they are emblematic of the broader national movement over the past decade, spurred on by federal legislation, to raise student performance in the United States by reforming and monitoring the preparation of American public school teachers. In particular, three pieces of legislation inform NYSED's—and many states'—recent efforts to strengthen teacher preparation. First, Title II of the *Higher Education Act of 1965*, as amended in 2008 as the *Higher Education Opportunity Act*, mandates that states submit and publicize annual reports that highlight key aspects of their teacher preparation systems. It requires that states provide information regarding the number of enrollees in teacher preparation programs who go on to complete their programs, and the proportion of

program completers who enrolled in traditional versus alternative preparation programs.<sup>4</sup> Second, Title II (Part A) of the *Elementary and Secondary Education Act* established a grant funding mechanism to support states' efforts to enhance teacher and principal recruitment, preparation, performance, and retention through partnerships with institutions of higher education that train these educators and with the local education agencies where they go on to work. Lastly, the Race to the Top (RTTT) Fund, part of the broader federal *American Recovery and Reinvestment Act of 2009*, made \$4.35 billion available to states to strengthen their public education systems. To win a competitive RTTT grant (which NYSED did), states were required to demonstrate, among other things, a plan for “monitoring, evaluating, and identifying areas of teacher and principal shortage and for preparing teachers and principals to fill these areas of shortage.”<sup>5</sup>

The provisions of these laws leave little to question about the motivation for, or the value of, this NYSED–SDP research collaboration. To aid NYSED's efforts to both comply with and capitalize on the reform strategies defined in these pieces of legislation, NYSED and SDP agreed on the scope of work described above and began their research collaboration in fall 2012. Below, we begin by describing findings concerning different aspects of the teacher supply system as a whole, including the prevalence of different certification pathways among novice teachers, public school employment outcomes for master's and bachelor's graduates, and public school employment outcomes by teacher preparation sector. Subsequently, we examine public school employment outcomes for candidates certified to teach different grade levels and subject areas. Building off of these findings, we investigate alternative certification programs, focusing on New York City, where most alternatively certified teachers are hired. To conclude, we examine the important policy questions that these findings have raised, as well as the steps being taken to answer them.

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## Analyses: Pathways for New Teachers

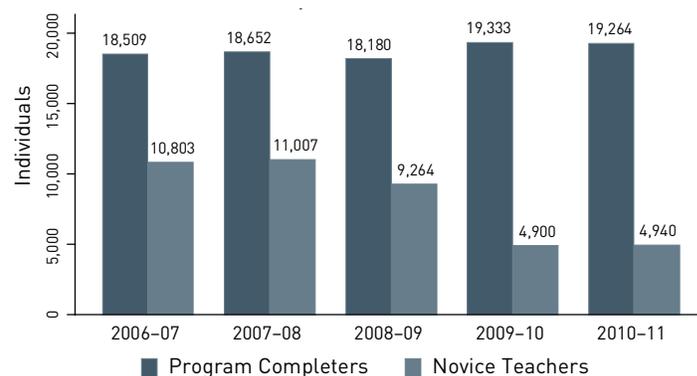
### Pathways for New Teachers

New York state colleges and universities grant degrees to a large number of new teacher candidates every year. Public schools in the state hire many of these graduates as novice teachers.<sup>6</sup> Figure 1 compares the annual number of new teacher candidates completing teacher preparation programs with the annual number of novice teachers hired in the state.<sup>7</sup> Between 2007 and 2011, about 19,000 new teacher candidates completed NYSED-approved teacher preparation programs each year.<sup>8</sup> A smaller number of novice teachers were hired to teach in the state's public schools. For example, in the 2006–07 and 2007–08 school years, there were roughly 11,000 novices hired each year. In 2009–10 and 2010–11, fewer than 5,000 novice teachers were hired each year, a possible result of hiring freezes and the poor economy. Figure 1 demonstrates two important points: First, many of those prepared by the state's teacher supply system do not go on to teach in public schools in New York State. Second, the supply of qualified new teacher candidates is not responsive to changes in demand in the short run.

In New York state, teachers at traditional public schools must hold valid teaching certificates for each of the subjects and age levels that they teach. In New York charter schools, at least 70% of the teaching staff must hold valid certificates. Specific requirements vary by subject, but most certificates require a bachelor's degree, a combination of academic coursework, general and content-specific tests, and student teaching. Since 2004, most new teacher candidates have been granted initial teaching certificates in specific subjects valid for five years, after which they can apply for professional certificates. In addition, some new teacher candidates enter the profession through alternative certification programs. Under the most common alternative program, participants receive a shorter-term "Transitional B" certificate, which can be converted to an initial certificate after completion of a teaching placement and master's coursework. To advance from an initial to a professional-level certificate, all teachers, whether from traditional or alternative pathways, must have three years of teaching experience, must participate in ongoing professional development, and must hold a master's degree.

Although new teacher candidates can choose from a number of certification pathways, most newly hired novice teachers come from traditional teacher preparation programs. Figure 2 shows the number of novice teachers hired in public schools in each of the 2007–08 through 2010–11 school years and which certification pathway

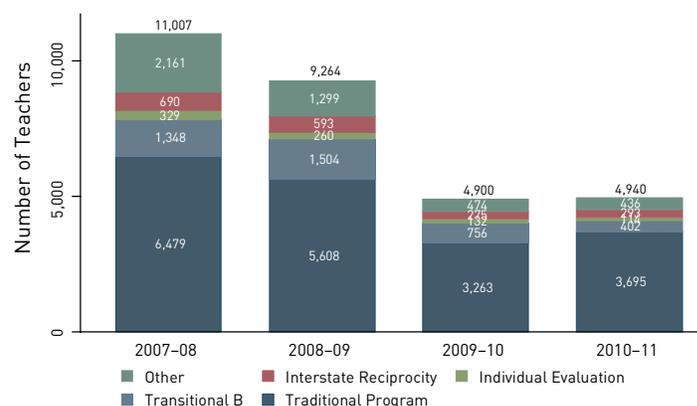
**Figure 1. New Teachers Prepared and Hired (by School Year)**



*Note.* Program completer sample includes individuals who completed teacher preparation programs at New York state institutions of higher education who were not employed as teachers in New York state public or charter schools prior to program completion. Novice teacher sample includes teachers who were in their first teaching year in New York state public or charter schools and reported having zero teaching experience. Data source: NYSED records.

The number of novice teachers hired in New York public schools fell in recent years while the number of new teacher candidates graduating remained steady.

**Figure 2. Novice Teachers (by Earliest Certification Path and School Year)**



*Note.* Sample includes 30,111 novice teachers with teacher job codes in New York state public or charter schools in the 2007–08 to 2010–11 school years. Novice teachers were in their first teaching year in New York state public or charter schools and reported having zero teaching experience. Certification path is based on first initial or Transitional B certificates received before hire and after 2004. Other category includes novices without initial or Transitional B certificates. Data Source: NYSED records.

Traditionally certified graduates made up the largest share of novice teachers.

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## Analyses: Pathways for New Teachers

they used when applying for their first classroom teaching certificate.<sup>9</sup> In 2007–08, there were approximately 11,000 novices hired, making up 5% of the teaching workforce. Of those, nearly 60% graduated from traditional programs while 12% were enrolled in Transitional B programs. Teachers who pursued certification through interstate reciprocity policies or NYSED’s individual evaluation option<sup>10</sup> (which grants certificates based on a review of candidates’ transcripts and other records) combined to make up another 10% of new hires. The remaining 20% of novices had not received either initial or Transitional B certificates. Of these, nearly half did not have teaching certificates, and many of the rest held provisional or internship certificates.<sup>11</sup> By the 2010–11 school year, the number of novices hired had fallen to below 5,000, just 2% of the public school teacher workforce. Initial certificate holders with degrees from traditional programs made up 75% of those hired, while the share of Transitional B novices fell to 8% of the newly hired workforce.

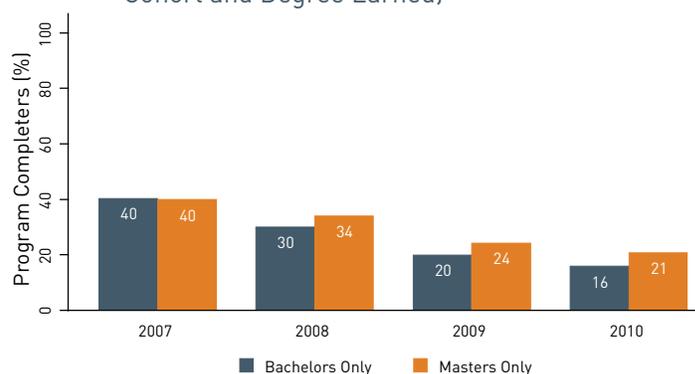
Though the majority of novice teachers graduated from traditional teacher preparation programs, most graduates of traditional programs had not secured teaching assignments in New York public schools within two years of graduation. From 2007 through 2010, roughly 17,000 new teacher candidates completed traditional teacher preparation programs annually. Of these graduates, 82% went on to apply for and be awarded initial teaching certificates within two years, but only 28% were hired to teach in New York public schools within the same two years.<sup>12</sup>

Figure 3 shows public school employment outcomes by year for four cohorts. Since training at both the bachelor’s and master’s levels can be used to satisfy New York state requirements for initial certificates, Figure 3 also examines whether there was a difference in outcomes for bachelor’s and master’s graduates. Among traditional program graduates in 2007 through 2010, there was little difference in public school employment for the two groups. During that time period, 42% of graduates without prior New York public school teaching experience earned bachelor’s degrees, 51% earned master’s degrees, 3% earned both, and 4% earned other credentials. As Figure 3 shows, there was a substantial fall-off in the share of graduates hired in successive cohorts for both bachelor’s and master’s graduates. For the 2007 cohort, 40% of both groups were hired in public schools within two years of graduation;

however, by the time members of the 2010 cohort graduated, masters’ degree holders were slightly more likely to be hired. For this cohort, 21% of master’s degree recipients were hired within two years compared with just 16% of bachelor’s degree recipients.

Though most traditional program graduates came from independent colleges and universities, graduates of public institutions were somewhat more likely to secure teaching assignments in New York public schools. Among graduates of nonprofit colleges in the 2007 through 2009 cohorts who were hired within two years of graduation, 61% were from the independent sector, 29% were from the State University of New York (SUNY) system, and the remaining 10% were from The City University of New York (CUNY) system.<sup>13</sup> Of these cohorts, 30%, 36%, and 33%, respectively, had secured public school teaching assignments. One year later, 26% of the independent sector graduates, 31% of the SUNY graduates, and 29% of the CUNY graduates were still teaching in New York public schools.

**Figure 3.** Program Completers Employed as Teachers Within Two Years (by Program Completion Cohort and Degree Earned)



Note. Sample includes individuals who completed teacher preparation programs at New York state institutions of higher education in 2006–07 to 2009–10 and who were not employed as teachers in New York state public or charter schools prior to program completion. Sample includes 16,921 program completers from the 2007 cohort, 16,914 from the 2008 cohort, 16,650 from the 2009 cohort, and 17,565 from the 2010 cohort. Program completers who received Transitional B or Transitional C certificates are excluded from the analysis. Data Source: NYSED records.

Similar shares of new teacher candidates with bachelor’s and master’s degrees were hired to teach in New York public schools.

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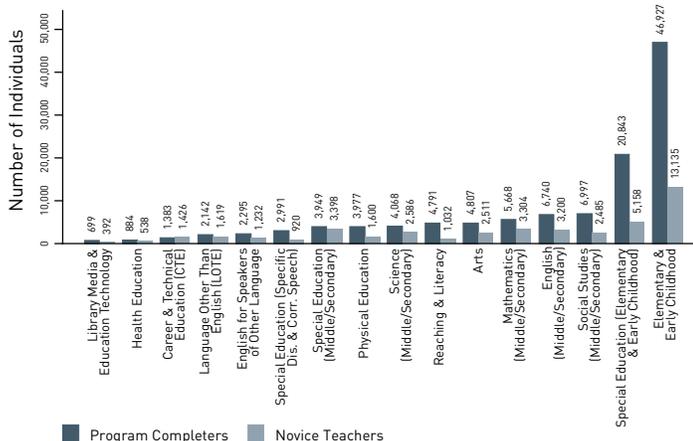
## Analyses: Employment Outcomes by Preparation Area

### Employment Outcomes by Preparation Area

New teacher candidates who were prepared to teach different subjects and grade levels experienced very different public school employment outcomes. Figure 4 compares the number of candidates completing programs in several major preparation areas with the number of newly hired novice teachers assigned to teach in each area in the 2006–07 through 2010–11 school years.<sup>14</sup>

As Figure 4 shows, traditional and alternative teacher preparation programs graduated nearly 47,000 new teacher candidates qualified in elementary and early childhood education. Over the same time period, only 13,000 public school novice teachers were hired and assigned to teach in that area. About 21,000 new teacher candidates were qualified in elementary and early childhood special education, while only 5,000 novices received assignments in that area. In contrast, in many subjects considered by NYSED to be teacher shortage areas, including English as a second language and middle and secondary school math, science, and special education, both the total number of graduates and novices hired and the ratio between them was much smaller. For

**Figure 4.** New Teachers Prepared and Hired in 2006–07 Through 2010–11 (by Subject)

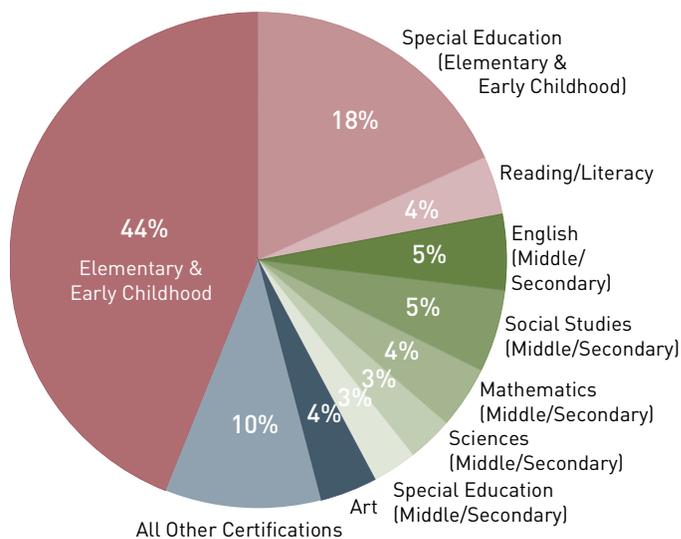


Note. Program completer sample includes individuals who completed teacher preparation programs at New York state institutions of higher education who were not employed as teachers in New York state public or charter schools prior to program completion. Novice teacher sample includes teachers who were in their first teaching year in New York state public or charter schools and reported having zero teaching experience. Data Source: NYSED records.

instance, in middle and secondary school math there were fewer than 6,000 qualified graduates in 2007 through 2011, and about 3,000 novices were hired and assigned to teach in that area. For middle and secondary school science, the comparable figures were 4,000 graduates and 2,500 novices.<sup>15</sup>

Figure 5 reveals that the largest categories of certificates awarded to graduates of traditional programs were in elementary and early childhood education. The data includes about 90,000 initial teaching certificates awarded to approximately 60,000 new teacher candidates who graduated in the 2007 through 2010 cohorts. The single largest category was elementary and early childhood education, at 44%, followed by elementary special education at 18% of all certificates. All major middle and secondary subjects including English, social studies, math, and science, together with middle and secondary special education, combined to make up less than one quarter of the certificates received.

**Figure 5.** Initial Certifications Received by Program Completers (by Subject, 2007–10)



Note. Sample includes certifications received within two years of graduation by teacher preparation program completers from New York state institutions of higher education who were not employed as teachers in New York state public or charter schools prior to program completion, including 88,354 certificates and 57,428 individuals. Program completers who received Transitional B or Transitional C certificates are excluded from the analysis. Data Source: NYSED records.

Approximately 3.5 times more candidates graduated in elementary and early childhood education than were hired as novices in New York public schools.

The greatest percentage of certificates awarded to traditional teacher preparation graduates were for teaching in elementary and early childhood.

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## Analyses: Employment Outcomes by Preparation Area

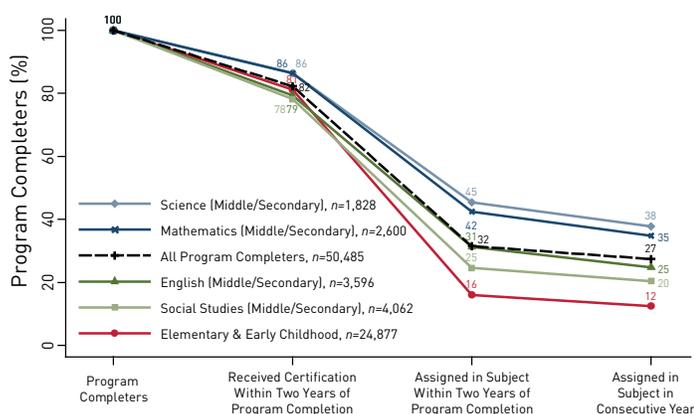
Figure 6 links individual records for new teacher candidates from traditional programs to examine employment outcomes by preparation and certification area. It traces the members of the 2007 through 2009 cohorts through the early stages of their careers—awarding of certification, employment, and retention into a second year of teaching—and compares all graduates with graduates qualified in a number of specific areas. Among all graduates, 82% received initial teaching certificates within two years. These graduates signaled their commitment to pursuing employment as teachers by completing the certification process. A much lower share of all graduates, 32%, were hired as public school teachers within two years while 27% continued teaching into a second year. Across the different preparation areas, roughly similar shares attained certification within their area—86% for math and science, and 78%, 79%, and 81% for social studies, English, and elementary and early childhood, respectively. The shares of graduates who attained certification and then went on to teach in a given area were much lower, ranging from 45% and 42% for science and math to just 16% for elementary and early childhood. Finally, the shares of graduates who continued teaching in the same area for a second year fell to 38% and 35% for science and math and to just 12% for elementary

and early childhood. Fewer than one in eight graduates trained in traditional elementary and early childhood programs were hired within two years and then continued to teach in that area after their novice year.

There was a similarly dramatic difference in hiring outcomes by school level for new special education candidates. As Figure 7 shows, traditional program graduates qualified in middle and secondary special education were about twice as likely to find jobs in their area within two years as graduates qualified in elementary and early childhood special education. Roughly two fifths of middle and secondary candidates were hired compared with roughly one fifth of elementary and early childhood candidates.

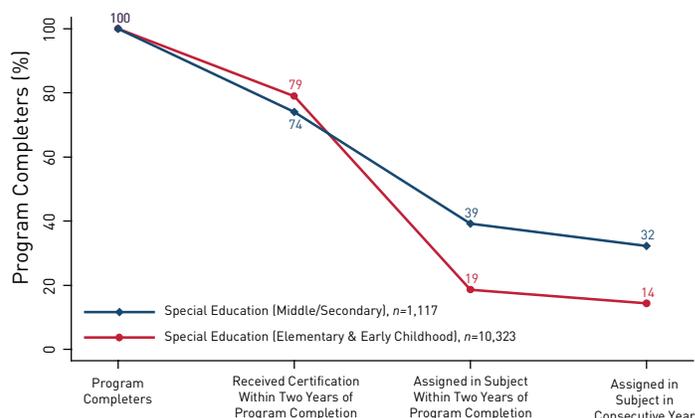
Since teachers can be certified in multiple areas and can also teach in multiple areas, restricting employment trajectories to candidates who were prepared, certified, assigned, and retained in one area may understate total public school employment for graduates prepared in a given area. Figure 8 shows the share of 2007 through 2010 graduates prepared and certified in each area who were hired to teach in that same area, as well as the share who were hired to teach in any other area. As Figure 8 shows, teacher candidates who received certifications

**Figure 6.** Teacher Preparation Trajectory (2007–09 Cohorts, by Subject)



Note. Each category includes individuals who completed New York state teacher preparation programs in 2006–07 through 2008–09 and were not employed as New York state public or charter school teachers prior to program completion. Assignments for all program completers category can be in any subject. Program completers who received Transitional B or Transitional C certificates are excluded from the analysis. Data Source: NYSED records.

**Figure 7.** Teacher Preparation Trajectory (by Special Education Level)



Note. Each subject category sample includes individuals who completed New York state teacher preparation programs in the subject in 2006–07 through 2008–09 and were not employed as New York state public or charter school teachers prior to program completion. Program completers who received Transitional B or Transitional C certificates are excluded from the analysis. Data Source: NYSED records.

Among major program categories, elementary education graduates were least likely to gain employment as teachers in New York public schools.

In special education, middle/secondary candidates were more likely to be hired and assigned than elementary candidates.

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## Analyses: Employment Outcomes by Preparation Area

in elementary and early childhood were the least likely to secure public school teaching assignments, even accounting for hiring in multiple areas. Only 17% of certified elementary and early childhood graduates found elementary and early childhood teaching jobs in public schools within two years while an additional 9% found teaching jobs in other areas. Many elementary education candidates were also certified in elementary special education. Of elementary and early childhood special education candidates, 35% found teaching jobs within two years, 22% in elementary special education and 13% in other areas. Similarly, the majority of graduates qualified as reading and literacy teachers were also qualified in elementary and early childhood education. Of those candidates, 15% held teaching assignments in reading and literacy and 32% in other areas.

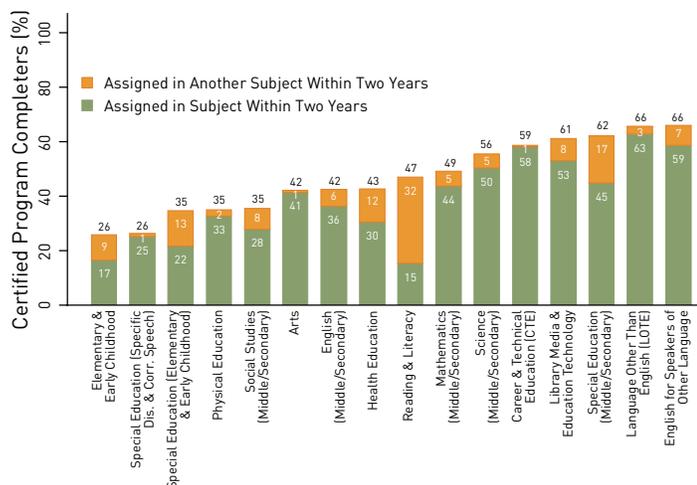
In contrast, the likelihood of being hired to teach in public schools was higher for candidates prepared in subjects typically considered to be shortage areas. Two thirds of candidates certified in English as a Second Language and foreign languages were hired within two years, as were the majority of middle and secondary special education, library, and vocational education candidates. Roughly half

of certified math and science candidates were able to find teaching jobs in public schools within two years.

One response of NYSED to the low share of elementary education graduates hired to teach in the state's public schools has been to encourage colleges and universities to have their students pursue multiple qualifications in order to increase their marketability. Overall, in the 2007 through 2010 cohorts, 25% of graduates received two certificates within two years of graduation while an additional 10% received three or more. The remainder held only one teaching certificate. The most common multiple certificate combinations were in the areas of elementary and early childhood education and elementary special education.

Figure 9 illustrates NYSED's reasoning in encouraging this elementary and early childhood certification policy. There were significant differences in hiring and retention outcomes for elementary and early childhood program graduates holding single and multiple certificates. Of elementary and early childhood graduates who went on to receive teaching certificates, 42% of those with three or more certificates were hired within two years compared with 37% of those with two certificates and only 21% of those with one certificate.

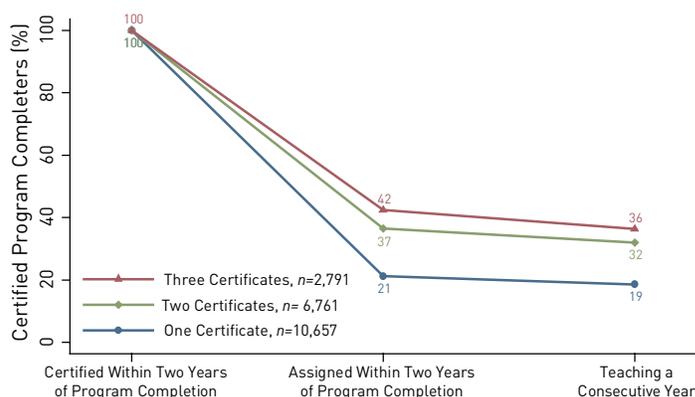
**Figure 8. Hiring (by Assignment Subject)**



Note. Each subject category sample includes certificate-holding new teacher candidates who completed New York state teacher preparation programs in the subject in 2006-07 through 2009-10 and were not employed as New York state public or charter school teachers prior to program completion. Full sample includes 67,199 program completer-subject pairings. Program completers who received Transitional B or Transitional C certificates are excluded from the analysis. Data Source: NYSED records.

The likelihood of attaining employment in New York public schools varied by certification subject.

**Figure 9. Elementary & Early Childhood Certification Trajectory (2007-09 Cohorts by Number of Initial Certificates Received)**



Note. Sample includes certificate-holding individuals who completed elementary & early childhood teacher preparation programs at New York state institutions of higher education in 2006-07 to 2008-09 and who were not employed as teachers in New York state public or charter schools prior to program completion. Program completers who received Transitional B or Transitional C certificates are excluded from the analysis. Data Source: NYSED records.

Elementary education graduates with multiple certificates were more likely to find teaching jobs.

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## Analyses: Alternative Certification Programs

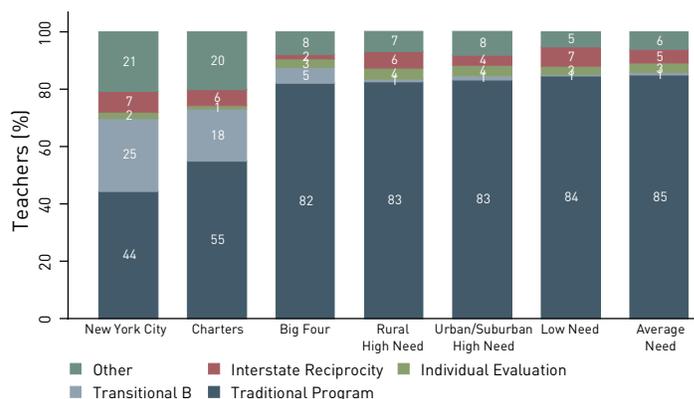
### Alternative Certification Programs in New York City

Between 1999 and 2003, the New York State Board of Regents raised teacher preparation standards, introduced new certification standards, and discontinued issuing temporary licenses. Alternative certification programs developed and expanded during this time as a way to meet the pressing need for certified teachers in specific geographic and subject areas. Unlike traditional programs, alternative programs typically provide training in only a limited number of certification areas. They are intended for new teacher candidates who already hold bachelor's or higher degrees in their teaching subjects but lack education training and coursework. Offered by colleges and universities in partnership with local school districts or charter schools, they feature an accelerated introductory component followed by the award of an alternative certificate, usually a Transitional B certificate.<sup>16</sup> After being placed into a teaching assignment, participants receive mentoring and take additional courses toward an education degree. Participants can apply to convert Transitional B certificates into initial teaching certificates after they complete their teaching requirement and other program commitments.

Alternatively certified teachers make up an especially large share of novice teachers in New York City, which has a roughly 30% share of the state's students and teachers overall. In the spring of 2002, more than 12,000 of New York City's 68,000 teachers had temporary licenses, the largest share of any district in the state. To meet the demand for certified teachers, programs such as New York City Teaching Fellows and Teach for America partnered with local colleges to place career changers and recent graduates in city schools. Since then, alternative programs have continued to supply a substantial share of New York City's novice teachers. The remainder of this section describes the distribution of alternatively certified novices and their prevalence in various teaching areas in New York City, and also examines retention for one cohort of traditionally and alternatively certified novices.

Figure 10 shows the share of novice teachers hired in the 2007–08 through 2010–11 school years who held alternative certifications in each of NYSED's school need categories, which combine geographic and poverty factors. One quarter of novices hired by the New York City public school district had Transitional B certifications, as did

**Figure 10.** Novice Teachers (by Earliest Certification Path and School Need Index)



*Note.* Sample includes 29,028 novice teachers with teacher job codes in New York state public or charter schools in the 2007–08 to 2010–11 school years. Novice teachers were in their first teaching year in New York state public or charter schools and reported having zero teaching experience. Certification path is based on first initial or Transitional B certificates received before hire and after 2004. Other category includes novices without initial or Transitional B certificates. Data Source: NYSED records.

Alternatively certified teachers made up a quarter of novice teachers in New York City.

nearly a fifth of charter school novices.<sup>17</sup> In the next four largest urban districts—Buffalo, Rochester, Yonkers, and Syracuse—5% of novices were alternatively certified, compared with only 1% of novices elsewhere in the state.

Transitional B novices tended to be concentrated in subjects that New York City education officials had identified as difficult-to-staff shortage areas. These included special education, bilingual education, mathematics, and the sciences.<sup>18</sup> Figure 11 shows which certification pathway New York City novice teachers used when applying for their first classroom teaching certificates in various subjects. The majority of middle and secondary special education teachers, 61%, were alternatively certified. Transitional B novices also made up a disproportionate share of science and math teachers, at 43% and 39% respectively. Transitional B novices were much less prevalent in areas of oversupply for traditional program graduates. For example, only 18% of elementary and early childhood novices came from Transitional B programs.

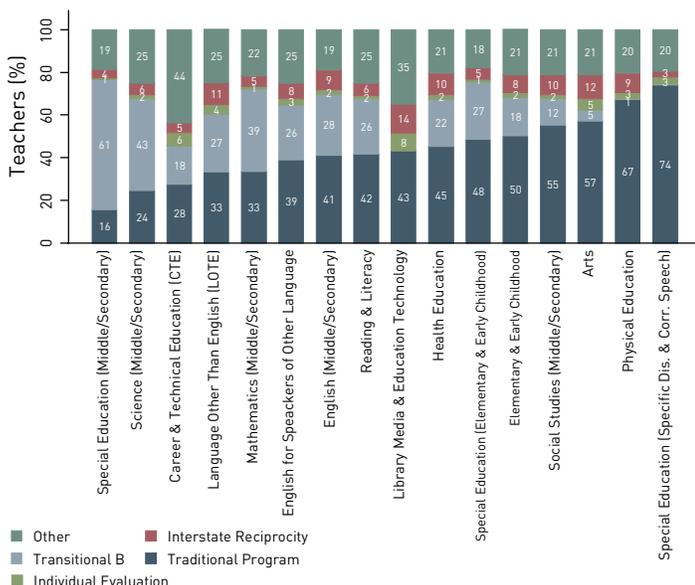
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## Analyses: Alternative Certification Programs

Examining retention for one cohort of novices hired in New York City in the 2007–08 school year, Figure 12 shows that long-term retention for Transitional B novices was somewhat lower than retention for traditional graduates. After one year, 95% of the Transitional B novices, who typically had committed to a two-year program, were still teaching in New York City. This share was somewhat higher than the 89% of traditional program graduates who were still teaching. By the third year, retention rates for the two groups had converged, at 83% for Transitional B novices and 84% for traditional program graduates. After the third year, retention was lower for the alternatively certified teachers, at 69% compared with 77% for traditional program graduates.

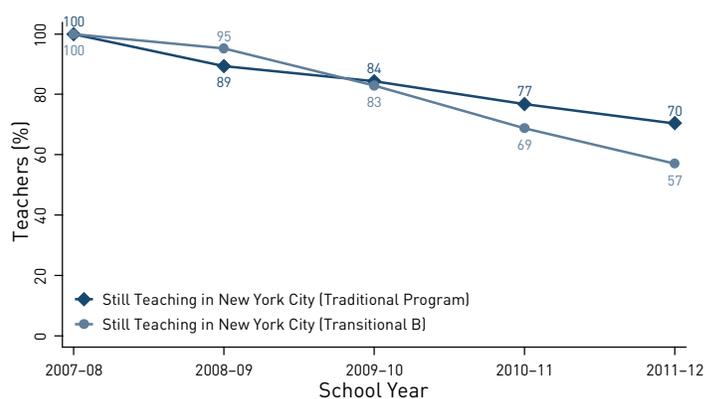
Four years after their novice year in the 2011–12 school year, the majority of teachers in both groups were still teaching in New York City, but only 57% of the original group of Transitional B novices remained, compared with 70% of the traditional program graduates. Transitional B teachers typically started their careers in smaller, higher poverty schools with lower achievement test scores than traditional program graduates.<sup>19</sup> Nonetheless, the retention gap between Transitional B and traditional program teachers persisted even after statistically adjusting for school characteristics.<sup>20</sup>

**Figure 11.** Certification Paths for Novice Teachers in New York City (by Assignment Subjects)



Note. Sample includes novice teachers with teacher job codes in New York City public schools in the 2007–08 to 2010–11 school years. Novice teachers were in their first teaching year in New York state public or charter schools and reported having zero teaching experience. Full sample includes 15,740 teacher-assignment pairs. Certification path is based on first initial or Transitional B certificates received before hire and after 2004. Other category includes novices without initial or Transitional B certificates. Data Source: NYSED records.

**Figure 12.** Retention Trajectory for Novice Teachers in New York City (by Certification Path)



Note. Sample includes 3,488 novice teachers with teacher job codes hired in New York City public schools in the 2007–08 school year. Novice teachers were in their first teaching year in New York state public or charter schools and reported having zero teaching experience. Certification path is based on first initial or Transitional B certificates received before hire and after 2004. Data Source: NYSED records.

In New York City, alternatively certified novice teachers tended to teach in shortage subject areas.

Alternatively certified novices were less likely than traditional graduates to continue teaching in New York City.

# SDP HUMAN CAPITAL DIAGNOSTIC

## Conclusion

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By describing the teacher preparation and certification landscape, this diagnostic helps raise important questions for NYSED to explore. SDP's descriptive diagnostics, by design, raise more questions than they answer, and this SDP-NYSED research collaboration is no exception. What accounts for the vast discrepancy between the number of individuals who graduate from teacher preparation programs and the number of new teachers who are hired across the state each year? How many of those who do not secure assignments in public schools choose to teach in private schools or in other positions in the broader education sector (e.g., preprimary education, curriculum development, educational research, etc.)? In this concluding section, we describe how this diagnostic research collaboration has helped NYSED understand key aspects of the state's teacher preparation and certification pipeline, built capacity within NYSED to execute this analytical work moving forward, raised important policy questions for the state to consider, and informed some of the concrete steps the state will take in its efforts to provide institutions of higher education with information about their graduates' performance.

A number of key findings emerge from this work. First, traditional preparation programs across the state produce many graduates who do not receive formal certification credentials and many more who, although certified, do not secure public school teaching assignments within two years of having graduated. This is particularly true of individuals who enroll in elementary and early childhood programs. As Figure 6 depicts, of graduates from these programs, 81% received certification within two years of having completed their programs and 16% secured teaching assignments in New York state public schools. Many of these graduates attend independent institutions of higher education, which may make it more difficult for NYSED to use financial and legislative policy levers to influence teacher supply and demand. At the same time, there are plenty of graduates of SUNY and CUNY preparation programs who do not go on to secure certification and teaching assignments. As a result, there is an opportunity within the public higher education sector to attempt to more closely match teacher supply with demand. Second, these analyses revealed that, while there are far fewer graduates of preparation programs in shortage areas, such as science, math, and

middle and secondary special education, graduates from these programs are more likely, on average, to receive certification and secure teaching assignments in New York state public schools, as shown in Figures 6 and 7. Third, there is some evidence that receiving certifications in multiple subjects is associated with higher rates of employment and retention. As seen in Figure 9, this is the case for individuals who enroll in elementary and early childhood programs. By contrast, across preparation programs in all areas, graduating from a master's program was associated with only slightly higher rates of employment than graduating from a baccalaureate program, as seen in Figure 3. Lastly, we find evidence that New York City's alternative certification programs are working as intended with regard to supplying teachers in subject shortage areas.

These analyses have also raised important questions for NYSED analysts and the research community alike to investigate next. For example:

- Most generally, where are the graduates of preparation programs who receive certifications but who do not secure teaching assignments and why? How many choose to teach in neighboring states? How many pursue employment outside of the educational sector?
- Using, in part, Race to the Top funds, institutions of higher education across the state have created new, clinically rich teacher preparation programs designed to help prospective teachers gain practical preservice training in challenging school environments. How do the certification, employment, and retention trajectories of graduates from these programs compare to those described here?
- Outside of New York City, how do the retention rates of graduates from alternative certification programs across the state compare to those of their traditional program counterparts? To what extent are any observed differences in their respective retention rates the result of alternatively certified teachers securing assignments in more challenging school environments and/or receiving certifications in subjects (e.g., math and science) associated with greater employment opportunities outside of the education sector?

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- How should policymakers and practitioners in the New York City public school system weigh the costs and benefits of the higher rates of turnover among those who pursue alternative certification, given that these teachers are more likely to secure assignments in high need schools and subject shortage areas?

Securing answers to these and other important questions will require additional rigorous research and the time and funds needed to support such efforts. However, this SDP–NYSED research partnership has bolstered NYSED’s ability to conduct research of this nature by cleaning and linking the state’s preparation, certification, and employment datasets to enable state analysts to trace the trajectories of new teacher candidates.

To aid NYSED’s efforts to update these analyses in the future, as additional years of data become available, SDP provided its linked analysis files to the state. NYSED analysts can use these same analysis files to facilitate “deeper dives” into the analytic questions that emerged from this initial collaboration. SDP has also given NYSED the programming code used to clean the data, build the analysis files, and carry out the analyses. This will enable NYSED to refine these analyses in response to changing policies, such as the development of new certification categories. To assist with NYSED’s efforts to incorporate these resources into their broader research agenda, SDP led a one-day training in Albany in December 2013. The goal of this training was to familiarize NYSED staff with the analysis files and programming code developed during the human capital and college-going diagnostics. Members of a newly formed NYSED metrics team attended along with SDP fellows and other NYSED analysts. The training included an introduction to Stata programming, reviews of analysis file structure and content, a review of programming code, and analytic exercises.

As NYSED analysts prepare to extend and enhance the analytical work begun as part of this diagnostic research collaboration, NYSED policymakers are using the findings from these analyses to help facilitate discussions about potential policy reforms related to teacher preparation and certification. For example, NYSED administrators are immersed in discussions about how they can work constructively with institutions of higher education across the independent and public (city and state) sectors to more closely match teacher supply and demand. Beyond providing institutions of higher education with summary information about their graduates’ certification, employment, and retention outcomes, what can NYSED policymakers do to compel them to produce talented new teachers who are prepared to work in the subjects and schools where they are most needed? Simultaneously, NYSED policymakers are considering how they might communicate directly with prospective teachers using the state’s certification website to convey information about the likelihood of hire associated with different certification subject areas and geographic regions. In addition to providing this critical information, state policymakers are contemplating which incentives might compel more prospective teachers who enroll in independent traditional preparation programs to pursue certification in subject shortage areas and assignments in high need schools across the state.

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## Endnotes

- 1 Throughout this report, the term “public schools” refers to both traditional public schools and charter schools.
- 2 Cohort is defined as the year in which new teacher candidates complete their preparation programs and receive their degrees.
- 3 SDP’s diagnostic research effort drew on earlier work, including reports developed by Boyd et al. (2009), which reviewed hiring outcomes by preparation area for a number of teacher preparation programs. NYSED’s (2012) Teacher Supply and Demand 2010-11 Report, which grouped certifications into major categories, was also a critical resource.
- 4 United States Department of Education [USDOE], 2013.
- 5 USDOE, 2009, and NYSED, 2010.
- 6 Novice teachers are those teachers who were in their first year of teaching and who reported having no prior teaching experience in New York public schools or elsewhere.
- 7 Information in Figure 1 about new teacher candidates is from Title II reports provided to NYSED by state-approved teacher preparation programs. Figure 1 does not include candidates who used other certification pathways to satisfy state requirements, including preparation in other than pre-approved programs or out of state. Information about novice teacher hiring is from annual NYSED employment surveys which provide a snapshot of employment in early October of each school year. Thus Figure 1 does not include novice hiring by private or out of state schools. Both new teacher candidates and experienced teachers can pursue education degrees for initial training or professional development. The sample of new teacher candidates described in Figure 1 and elsewhere in this report consists of those who had no prior public school teaching experience in the school years before their graduation year, based on New York state records dating back to 1998.
- 8 Analyses in this report which describe overall hiring or teacher preparation by school year use data from 2007–11. Analyses which track individual program graduates through certification and hiring focus on the 2007–10 graduating cohorts, while analyses which track individual graduates who are retained into a second year of teaching focus on the 2007–09 cohorts.
- 9 Teachers who went on to gain additional certificates, before or after being hired, may have used other pathways for later applications.
- 10 Changes to NYSED’s individual evaluation program are described at D’Agati, 2014.
- 11 NYSED changed its certification categories in 2004, but certificates granted earlier continued to be valid for teaching until they expired. As shown in Figure 2, this transition contributed to the share of novices in the “other” category falling over time. The share of novice teachers holding provisional certificates as their first teaching certificate fell from nearly 4% in 2008 to less than 1% in 2011. Other non-initial and Transitional B certificate categories declined as well, as did the share of novices without certificates. For consistency with other NYSED reports, most of the analyses in this report focus on novice teachers who held initial or Transitional B certificates. See NYSED Office of Teaching Initiatives, 2013.
- 12 Transitional B candidates were also affiliated with NYSED-approved programs at New York colleges and universities, but are not included in this and similar calculations because they followed a different pathway to employment. Transitional B candidates were placed into teaching assignments by their programs and pursued education degrees part-time while teaching.
- 13 Graduates of proprietary (for-profit) institutions of higher education are not included in this report.
- 14 This section groups specific NYSED-approved teacher preparation programs, initial teaching certificates, and public school teaching assignments into a consistent set of major subject and grade-level areas based on NYSED, 2012. Note that these areas are not mutually exclusive. Teachers can be prepared, certified, and assigned to teach in multiple areas.
- 15 This report uses information about actual hires, rather than vacancies, though NYSED has expressed interest in supplementing this report using vacancy information.
- 16 The analyses in this section focus on Transitional B alternative certificates, which made up 94% of alternative certificates awarded by NYSED between 2004 and 2011. A small number of Transitional A certificates were awarded in some career and technical education fields while Transitional C certificates are available to holders of professional and graduate degrees.
- 17 Students issued a Transitional B certificate had demonstrated their expertise in the content area and, beginning in May 2014, were also required to take the Educating All Students (EAS) exam prior to obtaining a Transitional B certificate.
- 18 NYSED Office of College and University Evaluation, 2013.
- 19 These findings are consistent with Boyd et al. (2009). Marinell (2011) finds that teacher turnover is higher in smaller, higher poverty New York City middle schools with lower achievement test scores.
- 20 Pallas & Buckley (2012) found a gap between New York City teaching fellows and traditionally certified teachers in thoughts about leaving teaching, controlling for teacher and school characteristics. Boyd et al. (2012) found that New York City teaching fellows with more than two years of experience were approximately twice as likely to leave teaching as were traditionally certified teachers with the same amount of experience, controlling for school fixed effects. In contrast, Kane, Rockoff, & Staiger (2008) did not find appreciable differences in retention rates between teaching fellows and traditionally certified novices in New York City, controlling for teacher age and cohort.

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Strategic Data Project, Center for Education Policy Research at Harvard University  
[cepr.harvard.edu/sdp](http://cepr.harvard.edu/sdp) | [sdp@gse.harvard.edu](mailto:sdp@gse.harvard.edu) | @HarvardCEPR  
50 Church Street | Floor 4 | Cambridge, MA 02138  
P: 617-496-1563 | F: 617-495-3814