

# Retention of and Access to Effective Teachers in DC Public Schools

By Elias Walsh<sup>1</sup>

## Abstract

I describe effective teaching in DC Public Schools (DCPS) as measured by scores from the IMPACT evaluation system, including retention and hiring of effective teachers, and access to effective teachers for low-income students. I ask whether DCPS retained its most effective teachers, how novice teachers compare to returning and veteran teachers, and whether students in high-poverty schools are more or less likely to be taught by effective teachers. I also ask whether teachers' decisions to remain at their school from one year to the next are related to the percentage of students from low-income households at that school. To answer these questions, I examine IMPACT data from the 2010–2011 and 2011–2012 school years. Because the analysis is based on IMPACT scores—the measure of teacher effectiveness used in DCPS to make retention and performance pay decisions—this descriptive analysis provides new insight into the implementation of IMPACT and related policies in DCPS. The analysis also suggests several questions for further analysis.

Note: The text that follows has been excerpted from two reports by the DC Education Consortium for Research and Evaluation (DC-EdCORE). The full reports are available on the website for the Office of the DC Auditor: <http://dcauditor.org/reports/2013>. Contributors to the DC-EdCORE reports included researchers at Policy Studies Associates, American Institutes for Research, George Washington University, and Mathematica Policy Research.

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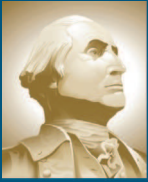
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## **Evaluation of the DC Public Education Reform Amendment Act (PERAA)**

July 15, 2013

The Education Consortium for Research and Evaluation (EdCORE)



THE GEORGE  
WASHINGTON  
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WASHINGTON, DC

*EdCORE*  
The Education Consortium for Research and Evaluation

# Evaluation of the DC Public Education Reform Amendment Act (PERAA)

Report No. 1: School Year 2010-2011  
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Report No. 1: School Year 2010-11  
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The Education Consortium for Research and Evaluation (EdCORE) is led by the Graduate School of Education and Human Development at the George Washington University, in partnership with American Institutes for Research, Mathematica Policy Research, Policy Studies Associates, Quill Research Associates, and RAND.

### **About EdCORE**

EdCORE is a consortium led by the Graduate School of Education and Human Development of the George Washington University in partnership with American Institutes for Research (AIR), Mathematica Policy Research, Inc. (MPR), Policy Studies Associates (PSA), Quill Research Associates, and RAND.

EdCORE was established in 2012, in response to the National Research Council's recommendation for a sustainable program of independent research and evaluation.\* Our mission is to provide objective and reliable evidence to inform continuous improvement of public education, at all levels, in the District of Columbia.

The current EdCORE portfolio, of which this PERAA report series is a part, includes research on changes in special education policies; and science, technology, engineering, and mathematics (STEM) course taking in DC schools. Future studies of teaching, learning, and school governance are planned.

\* See: National Research Council, *A Plan for Evaluation the District of Columbia's Public Schools: From Impressions to Evidence*, Washington: National Academies Press, 2011.

## Foreword

This report is the first in a new series responding to the mandate for independent evaluation included in the District of Columbia's Public Education Reform Amendment Act (PERAA) of 2007. In accordance with a request from the DC Auditor on behalf of the DC government, as specified in its contract with the National Academy of Sciences (NAS), the report pertains primarily to the 2010-2011 school year.

The report was prepared by EdCORE under a subcontract to the NAS, and is organized according to the four broad topics mentioned in PERAA and further refined by the DC Auditor:

- *Business practices and strategies*, including organizational structure and roles, financial management, operations management, facilities and maintenance; resource allocations; public accountability; interagency collaboration; and stakeholder engagement and responsiveness.
- *Human resources operations and human capital strategies*, including the number (and percentage) of highly qualified teachers; retention rate for effective teachers; schools and wards served by effective teachers; length of time principals and administrators serve; types of leadership strategies used; and responsibilities of central office versus school level leadership.
- *Academic plans*, including integration of curriculum and program specific focus into schools and grade progression and credit accumulation.
- *Student achievement*, including a description of student achievement that includes academic growth; proficiency; and other (non-academic) educational outcomes.

The scope of the auditor's information request indicates the variety of ways to evaluate the district's progress. The 2010-2011 snapshot, along with a description of selected indicators of student achievement between 2006-2007 and 2010-2011, though informative, is not sufficient to fully describe PERAA implementation or infer trends or their causes. Because this report is the first of a series, and focuses primarily on a single year of data, we include Questions for Further Analysis.

Subsequent reports will cover other periods: each one will provide a snapshot of selected events and indicators for a given school year along with a trend analysis of one or more of the topics mentioned in PERAA. A summative report that will look across the years covered in this series will be prepared by the NAS Committee for the Five Year (2009-2013) Summative Evaluation of the District of Columbia Public Schools and released in 2014.

Although this report includes achievement data from prior years, it would be imprudent to assume any linear trends or to attribute observed differences between 2007 and 2011 to the enactment and implementation of PERAA. Causal inferences of this sort cannot be established without substantially more information and statistical analysis. The report will emphasize this caution to avoid misunderstandings or premature interpretations.

In addition, it is important to note that as this first report was being drafted, questions arose about the validity and reliability of student achievement test scores in the District, because of alleged breaches of test security. *These questions make it imperative to view results that pertain to student achievement with caution.*

In addition to the direct support of the DC government through the NAS, the work reported here was supported indirectly by funds from a combination of public and private organizations that have helped create and build the EdCORE consortium. The National Science Foundation, an early supporter of the consortium as an innovation in the evaluation of urban education reform, provided a grant for general support and in-depth analysis of STEM course taking (which is not part of the PERAA mandate and is not covered in this report). We are grateful to Janice Earle and her colleagues for their enthusiastic help.

We also wish to thank GW Vice President for Research, Leo Chalupa, and Provost Steven Lerman, for their institutional support, without which it would not have been possible to fulfill the demands of the PERAA evaluation and related activities. Current and past faculty of the Graduate School of Education and Human Development (GSEHD), including Rebecca Thessin, Sam Steen, Josh Glazer and Marian Robinson provided important input at various stages of the consortium's development. Taunya Nesin has been an extraordinary graduate research assistant.

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We are especially grateful to our colleagues at the NAS – Stuart Elliott, Alix Beatty, and committee co-chairs Lorraine McDonnell, and Carl Cohn – for their confidence in EdCORE to conduct the mandated analyses and for their wise counsel on matters technical and stylistic. Their comments on earlier drafts of the report contributed to its improvement, but EdCORE remains solely responsible for its contents.

Finally we wish to thank DC Auditor Yolanda Branche and Deputy Auditor Lawrence Perry for their consummate professionalism and gracious management of the contracting process.

This report was written by a team from EdCORE. Brenda Turnbull, Principal of Policy Studies Associates, with researchers Erikson Arcaira, Stephen Coleman, Jaclyn MacFarlane, and Andrea Palmiter, led the analysis of business practices and strategies (section 1) and academic plans (section 3). Elias Walsh, Researcher at Mathematica Policy Research, with Steven Glazerman, Senior Fellow, took the lead on human resources operations and human capital strategies (section 2). Umut Ozek and Erin Dunlop, researchers at the AIR/National Center for Analysis of Longitudinal Data in Education Research (CALDER), with Jane Hannaway, Vice President, analyzed the student test data (section 4). Beatrice Birman (AIR) and Jennifer Steele (RAND) provided invaluable commentary and editorial contributions. Maxine Freund and Taunya Nesin (GW) provided technical, logistical, and conceptual support at all phases of the work. The deft handling of contractual matters by Viola Horek (of the NRC) and Christine Tomasik and Charles Maples (of GW) is much appreciated.

We thank the EdCORE partners for their patience, perseverance, and extraordinary contributions of time and energy. They are exemplars of the very finest and most generous traditions of social scientists coming together for the public good.

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## Section II

### **Human Resources Operations and Human Capital Strategies, School Year 2010-2011**

PERAA required periodic reports assessing the Act's impact on DCPS business practices and strategies, human resources and human capital strategies, academic plans, and student achievement. This section describes DCPS's human resources and human capital strategies *during the 2010-2011 school year*, and may be suggestive of the condition of DCPS more generally after PERAA's passage in 2007. But the analysis is neither intended nor adequate as the basis for causal judgments of the specific effects of PERAA on teacher and student outcomes.

Human capital strategies were a prominent component of the reform vision of Mayor Fenty and Chancellor Rhee. These strategies included rewards for top performers and support for weaker performers with a desire to improve. They also included consequences for unsatisfactory performance. In a five-year action plan for DCPS issued in "working draft" form in 2009, the section on human capital acknowledged that one component of the strategy would be to "identify and transition out a significant share of the teaching corps in the next two years" (District of Columbia Public Schools, 2009, p. 36). In addition to offering voluntary buy-outs, DCPS would dismiss teachers with poor performance.

Shortly before the beginning of the 2010-2011 school year, in July 2010, a new contract negotiated with the Washington Teachers Union took effect. It included several provisions that rewarded teachers, along with other provisions that diminished their job security. Among its major provisions were the following:

- a 21.6 percent raise over five years;
- an option for teachers to receive individual performance bonuses in exchange for waiving their rights if they are exceeded;
- new flexibility to dismiss ineffective teachers;
- school system authority over staffing and scheduling decisions;
- collaboration between the school system and the union to improve low performing schools, provide professional development, and improve discipline and safety procedures;
- changes in procedures for excessing due to enrollment, program, or budget changes: rather than guaranteeing excessed teachers other spots in the system based on their seniority, principals will have a choice of whether to accepting teachers who have lost their positions; and
- the opportunity for excessed teachers in good standing to take a \$25,000 buyout, early retirement if they have 20 years of service, or a full year of pay and benefits while looking for another position in the system.

Results of the first round of the IMPACT system for teacher performance evaluation (during the 2009-10 school year) were released in July 2010. A total of 126.5

teachers lost their jobs in the wake of these results (Washington Post, 2010). This included 75 teachers rated ineffective and 51.5 who were rated minimally effective and could not find placements.

In this report, we measure teacher effectiveness using IMPACT data (the box below provides an overview of IMPACT). Although there may be qualities of effective teachers that it does not measure, the IMPACT score was specifically designed to evaluate DCPS teachers.

***IMPACT: a new approach to the evaluation of teachers in DC***

A major policy change for human resources and human capital strategies in DCPS was the creation of the IMPACT system for teacher performance evaluation. Teachers receive annual evaluation scores under IMPACT that are used to make retention and performance pay decisions. The composition of a teacher's IMPACT score is based on the teacher's IMPACT group. For the 2010–2011 school year—the second year of IMPACT—Group 1 consisted of general education teachers of math and reading in grades 4 through 8, the grades for which test score data are needed to calculate teacher “value added”—a measure of teacher effectiveness that seeks to isolate how much a teacher contributes to student achievement from any confounding factors outside the teacher's control (Isenberg & Hock, 2012). Group 2 included all other general education teachers. Groups 3 through 7 included non-general education teachers such as special education and English-language-learner teachers.

Most teachers received an IMPACT evaluation score composed of (1) evaluations by school administrators and third-party trained observers using a classroom observation rubric; (2) an individual value-added (IVA) measure of student achievement growth for Group 1 or an alternative measure based on achievement targets determined by the teacher and principal for most other teachers; (3) a principal-assessed measure of the teacher's collaboration with colleagues and support of school initiatives and programs; (4) a principal-assessed measure of the teacher's attendance, adherence to school policies, and professionalism; and (5) a school value-added score.

The weights for each component in the total score depended on a teacher's IMPACT group. Fifty percent of the total evaluation score for Group 1 teachers was composed of the IVA score in the 2010–2011 school year. For all groups, the total evaluation score ranged from 100 to 400 points. Based on this score, a teacher received one of four possible effectiveness ratings: highly effective (350 to 400 points), effective (250 to 349 points), minimally effective (175 to 249 points), or ineffective (100 to 174 points). Under IMPACT, teachers who earn a highly effective rating receive performance pay, and those who earn an ineffective rating in one year or a minimally effective rating for two consecutive years are dismissed. For the 2010–2011 school year, most teachers were in Group 1 or 2; 14 percent of teachers were in Group 1, and 64 percent of teachers were in Group 2.

Our analysis of DCPS human resources and human capital strategies (the Technical Appendix to Section 2 provides methodological details) addresses research questions under three topic areas, as required by PERAA:

1. **Retention of effective teachers.** Did DCPS retain its most effective teachers – *where effectiveness is measured by IMPACT*? How effective are teachers who are new to DCPS relative to more experienced teachers?
2. **Distribution of effective teachers.** Are students in high-poverty schools more or less likely to be taught by teachers rated as effective by IMPACT? Are teachers’ decisions to remain at their school from one year to the next related to the poverty rate of students at that school?
3. **Tenure and experience of principals.** How many years of experience within DCPS does the typical DCPS principal have? Is principal experience related to the poverty rate of students in the school?

One possible drawback to using IMPACT scores as our measure of teacher effectiveness is that the scores are not necessarily comparable across all teachers because the scores are composed of different components and are combined by using different weights by IMPACT group.

Another limitation arises because DCPS uses IMPACT scores to make significant personnel decisions about teachers, including dismissals. Even if IMPACT scores provide highly accurate measures of teacher effectiveness, no measure can provide a perfect evaluation. Due to misclassification errors in IMPACT, comparisons based on IMPACT may overstate – or understate – improvements in DCPS teacher effectiveness.

**CAUTION**

A particular form of misclassification error arises if some test scores were compromised because of alleged breaches of test security. The individual value-added (IVA) component of the IMPACT score is based on test scores that are used to measure student achievement at baseline—at the end of the previous school year—and at the end of the evaluation year. Test scores that have been identified by DCPS as invalid for security reasons after investigation are excluded from the value added analysis in the following year. Consequently, the IVA score does not hold teachers accountable for the achievement of students with baseline scores known to be compromised.

However, if baseline test scores are not known to be compromised, or if any end-of-year scores are compromised, some teachers may be held accountable for the achievement of students – and the IVA score may measure some teachers’ contributions to student achievement – using compromised test scores from the year of the evaluation. DCPS has stated that they have not found evidence of widespread cheating. However, to the extent that there were test score security breaches, especially any that did not result in test score exclusions, IMPACT scores may be compromised.

For example, it is possible that an effective teacher was misclassified as minimally effective two years in a row, subsequently dismissed, and then replaced by an equally effective teacher. Even though such turnover would not change the overall

effectiveness of DCPS teachers, a comparison of IMPACT scores would suggest that DCPS has improved its teaching staff based on the erroneous rating of minimally effective for the dismissed teacher. A misclassification error in the other direction—a minimally effective teacher misclassified as effective—would also show erroneous improvement because it would appear that DCPS properly retained an effective teacher.

We use principal experience to measure the effectiveness of principals. Whereas previous research has found a relationship between experience and principal effectiveness, experience is not a precise measure of effectiveness.<sup>3</sup> One alternative is to directly measure principals' contributions to student achievement. However principal effectiveness is difficult to distinguish from other school-level contributions to student achievement (Lipscomb, Chiang, & Gill, 2012). A standard approach to measuring principals' contributions to student achievement is to compare the change in student achievement when there is a change in school leadership. It is not possible to apply this strategy to measuring the effectiveness of DCPS principals because nearly all principals lead only a single school for their entire tenure in DCPS.

#### *Retention of DCPS Teachers: Effectiveness and Experience*

**DCPS retained most teachers classified as effective or highly effective by IMPACT.**<sup>4</sup> Overall, 81 percent of 2009–2010 teachers in DCPS were retained for 2010–2011 (first panel of Table 1). DCPS retained 89 percent of teachers in the highly effective category and 83 percent in the next-highest IMPACT category (effective). DCPS retained 70 percent of minimally effective teachers and no ineffective teachers for 2010–2011. The lower retention rates for minimally effective and ineffective teachers are consistent with the DCPS IMPACT policy that teachers in the minimally effective category for two consecutive years or in the ineffective category for a single year are subject to separation.

Although the overall retention rates for Group 1 and non-Group 1 teachers are similar, within each of the four IMPACT effectiveness categories, non-Group 1 teachers were less likely than Group 1 teachers to be retained (second and third panels of Table 1). All but one of the 37 Group 1 teachers—those with an IVA score—in the highly effective category in the 2009–10 school year (97 percent) were retained for 2010–2011. Of the non-Group 1 teachers in the highly effective category in the 2009–10 school year, 89 percent were retained for 2010–2011. The

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<sup>3</sup> Earlier work has shown that more experienced principals make greater contributions to student achievement (Clark, Martorell, & Rockoff, 2009; Branch, Hanushek, & Rivkin, 2012; Dhuey & Smith, 2012b), though some studies have not confirmed a link between experience and principal effectiveness (Buck, 2012; Dhuey & Smith 2012a).

<sup>4</sup> Retention rates do not distinguish between teachers dismissed under IMPACT and teachers who exited voluntarily; for example, some non-retained teachers may have assumed administrative roles.

retention rates for Group 1 teachers rated effective was 85 percent, and the same rate for non-Group 1 teachers was 83 percent. Similarly, the retention rate for Group 1 teachers rated minimally effective was 76 percent, and the same rate for non-Group 1 teachers was 68 percent. As with Group 1 teachers, DCPS retained no ineffective non-Group 1 teachers for 2010–2011. The average IMPACT score of all Group 1 teachers was 276 points, and the average for retained Group 1 teachers was 283 points. The same averages for Group 2 through 8 teachers were 301 and 307.

The overall retention rates for Group 1 and non-Group 1 teachers—82 versus 81 percent—do not reflect the lower retention rate for non-Group 1 teachers within each effectiveness category because a higher proportion of non-Group 1 teachers were rated as effective or highly effective. For example, 17 percent of non-Group 1 teachers were rated highly effective, whereas only 8 percent of Group 1 teachers received the same rating. The higher proportion of highly-effective non-Group 1 teachers brings up the overall average retention rate for non-Group 1 teachers because these teachers are the most likely to be retained.

The lower retention rates for highly effective non-Group 1 teachers could reflect differences in the construction of the IMPACT scores for these teachers rather than the school system’s failure to retain some of the most effective non-Group 1 teachers. For example, the average IVA score received by a Group 1 teacher was 2.5, but the average score on the component that replaces IVA for non-Group 1 teachers was 2.8 (both on scales of 1.0 to 4.0). Consequently, a higher proportion of non-Group 1 teachers received highly effective ratings.

**Table 1. Retention of Effective Teachers in DCPS, 2010–2011 School Year**

2009–2010 IMPACT Rating	Number of Teachers	Number Retained	Proportion Retained for 2010–2011 School Year
Groups 1 Through 8 (all teachers)			
Highly effective (350 to 400 points)	543	484	89.1%
Effective (250 to 349 points)	2,471	2,057	83.2%
Minimally effective (175 to 249 points)	459	321	69.9%
Ineffective (100 to 174 points)	62	0	0.0%
All IMPACT ratings	3,535	2,862	81.0%
Group 1 (teachers with IVA scores)			
Highly effective (350 to 400 points)	37	36	97.3%
Effective (250 to 349 points)	305	259	84.9%
Minimally effective (175 to 249 points)	124	94	75.8%
Ineffective (100 to 174 points)	10	0	0.0%
All IMPACT ratings	476	389	81.7%
Groups 2 Through 8 (teachers without IVA scores)			
Highly effective (350 to 400 points)	506	448	88.5%
Effective (250 to 349 points)	2,166	1,798	83.0%
Minimally effective (175 to 249 points)	335	227	67.8%
Ineffective (100 to 174 points)	52	0	0.0%
All IMPACT ratings	3,059	2,473	80.8%

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes all 3,535 Group 1 through 8 teachers in the 2009–2010 school year. Teachers are considered to have exited DCPS if they do not receive an IMPACT score in Groups 1 through 7 in the 2010–2011 school year. IMPACT classified teachers into eight groups in the 2009–2010 school year, and seven in 2010–2011.

### Teacher experience and IMPACT scores

**More experienced DCPS teachers received higher IMPACT scores on average, than less experienced teachers.** Note, however, that most teachers new to DCPS were rated effective or highly effective. During the 2010–2011 school year, about 18 percent of teachers were new to DCPS, and about 27 percent of teachers were in their second year of teaching in DCPS.<sup>5</sup>

In Table 2, we show the proportions of novice—separately for new and second-year teachers—and more experienced teachers in each of the four IMPACT effectiveness categories. Novice teachers—those in their first two years of teaching—were less likely to earn ratings of highly effective and more likely to earn ratings of minimally effective or ineffective. Eight percent of new teachers, 13 percent of second-year

<sup>5</sup> Earlier research has demonstrated that teachers tend to improve in their first few years of teaching (Rockoff, 2004; Hanushek et al., 2005; Harris & Sass, 2010).

teachers, and 17 percent of other returning teachers achieved ratings of highly effective in the 2010–2011 school year.

**Table 2. Effectiveness of New and Returning Teachers to DCPS, 2010–2011 School Year**

2010–2011 IMPACT Rating	New Teachers		Second-Year Teachers		All Other Returning Teachers	
	Number of Teachers	Proportion of All New Teachers	Number of Teachers	Proportion of All Second-Year Teachers	Number of Teachers	Proportion of All Other Returning Teachers
Highly effective (350 to 400 points)	48	7.7%	118	12.5%	322	16.8%
Effective (250 to 349 points)	440	71.0%	640	68.0%	1,348	70.2%
Minimally effective (175 to 249 points)	115	18.5%	157	16.7%	228	11.9%
Ineffective (100 to 174 points)	17	2.7%	26	2.8%	22	1.1%
All Teachers	620	100%	941	100%	1,920	100%

**Source:** Mathematica calculations based on administrative data from DCPS.

**Notes:** The table includes all 3,481 Group 1 through 8 teachers in the 2010–2011 school year. New teachers in the 2010–2011 school year did not teach during the 2009–10 school year. Second-year teachers taught during the 2009–10 school year, but not in the previous year. All other returning teachers taught during both the 2008–09 and 2009–10 school years.

The combined ratings of minimally effective and ineffective characterized 21 percent of new teachers, 19 percent of second-year teachers, and 13 percent of other returning teachers. The IMPACT scores also reflected the relationship between IMPACT ratings and experience; the average new teacher received an IMPACT score of 283 points, and the same averages were 291 points for second-year teachers and 303 for other returning teachers.

Novice teachers may be less effective than veteran teachers, but they could nonetheless become more effective over time. The higher effectiveness of second-year teachers relative to new teachers could reflect the growth in effectiveness attributable to experience, differences in the quality of the two cohorts of new hires, or both. Even if less experienced teachers become more effective over time, they were less effective on average during the 2010–2011 school year.

Our findings on the relationships between teacher retention, experience, and effectiveness are consistent with progress on the IMPACT system’s primary goal: to improve the effectiveness of DCPS teachers. For teachers identified by IMPACT as



the most effective, DCPS retains them at a higher rate than it does less effective teachers.

However, to the extent that IMPACT misclassifies teachers—no measure of teacher effectiveness is perfect—the teachers retained by IMPACT may be less effective than our results indicate, and dismissed teachers may be more effective than our results indicate. Additionally, the IVA component of some teachers' IMPACT scores may be affected by compromised test scores, though DCPS has stated that they have not found evidence of widespread cheating.

We also found that most new teachers hired to replace ineffective teachers earned ratings of effective or highly effective. However, even though most new teachers to DCPS receive high IMPACT ratings, these teachers are on average less effective than their more experienced colleagues based on IMPACT scores. The district's success in improving teacher effectiveness may depend on whether and how much new teachers improve over time.

## *2. Distribution of Effective DCPS Teachers*

Access to effective teachers in DCPS may be related to individual student or school-level poverty. Recent work has shown evidence of gaps in the effectiveness of teachers based on student poverty (Tennessee Department of Education, 2007; Hahnel & Jackson, 2012), although some studies have shown mixed results, depending on districts or grade levels studied (Sass et al., 2010; Glazerman & Max, 2011).

To the extent that unequal access to effective teachers poses a challenge in DCPS, IMPACT may help equalize access over time. For example, through IMPACT, DCPS offers monetary incentives that may induce highly effective teachers to teach in high-poverty schools at the same time it dismisses ineffective teachers. Such incentives could improve the average quality of teachers overall in DCPS as well as the quality of teachers in high-poverty schools. If teacher effectiveness was related to school poverty before IMPACT, then high-poverty schools—those with the highest concentrations of ineffective teachers—may see the most teacher turnover as a result of IMPACT.

**On average, teachers in high-poverty schools received lower IMPACT scores than teachers in low-poverty schools.** We found that, on average, teachers in low-poverty schools were more likely to earn ratings of highly effective and receive higher IMPACT scores. Whereas 28 percent of teachers in low-poverty schools received highly effective ratings, only 10 percent in medium-poverty schools and 7 percent in high-poverty schools (first row of Table 3) achieved ratings of highly effective. The average teacher in a low-poverty school received an IMPACT score of 320 points (second panel of Table 3) in contrast to a score that was 31 points lower for teachers in medium-poverty schools and 33 points lower for teachers in high-



poverty schools. Each of the individual components used to calculate IMPACT scores also reflected the higher score for teachers in low-poverty schools. The components are scored on a scale of 1.0 through 4.0, except for the Core Professionalism component, which is scored on a scale of 0 (best) to -40 (worst).

**Teachers in high-poverty schools were more likely than teachers in medium- or low-poverty schools to leave DCPS.** Teachers in high-poverty schools were less likely to remain in the same school between the 2009–10 and 2010–2011 school years. In the top panel of Table 4, we show the proportion of teachers in low-, medium-, and high-poverty schools who remained in the same school (“stayers”), moved between two schools (“movers”), and left DCPS between these years (“leavers”). Whereas 83 percent of teachers in low- and medium-poverty schools remained in the same school from one year to the next, only 62 percent of teachers in high-poverty schools did so (first row of Table 4). The difference primarily reflects a higher proportion of teachers in high-poverty schools leaving DCPS (third row of Table 4).

**Table 3. Teacher Effectiveness by School Poverty in DCPS, 2010–2011 School Year**

	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
Percentage of Teachers with a 2010-2011 IMPACT Rating of:				
Highly effective (350 to 400 points)	28.4%	9.6%	7.2%	13.4%
Effective (250 to 349 points)	64.3%	71.9%	72.4%	70.2%
Minimally effective (175 to 249 points)	6.2%	16.3%	18.5%	14.6%
Ineffective (100 to 174 points)	1.1%	2.2%	1.8%	1.8%
Total	100.0%	100.0%	100.0%	100.0%
Average 2010–2011 IMPACT Score	320	289	287	296
Average Score by Component:				
Teaching and Learning Framework	3.2	3.0	2.9	3.0
Commitment to the School Community	3.4	3.2	3.2	3.2
Individual Value Added	2.9	2.4	2.4	2.5
School Value Added	3.0	2.4	2.4	2.6
Teacher-Assessed Student Achievement Data	3.3	2.9	3.0	3.0
Average Core Professionalism Penalty	-2.5	-4.0	-3.6	-3.5
Number of Teachers	818	1,492	1,091	3,401

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes the 3,401 Group 1 through 8 teachers in the 2010–2011 school year teaching in a school for which school poverty rates were available. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible. Average scores for IMPACT components include only teachers with a valid score on the component.

**Teachers in high-poverty schools who left were less effective on average than teachers who left medium- or low-poverty schools.** The higher proportion of leavers in high-poverty schools could reflect an effort to dismiss the least effective teachers; as shown in Table 3, high-poverty schools tend to have less effective teachers. We show in the second panel of Table 4 that the teachers who left DCPS from high-poverty schools had an average IMPACT score of 260. By comparison, leavers from medium-poverty schools had an average score of 278, and leavers from low-poverty schools had an average score of 304. Not all exits from low-poverty schools, however, result from dismissals; a score of 260 is still 11 points above the threshold rating of an effective teacher rather than a minimally effective teacher.

Even so, 37 percent of leavers from high-poverty schools were minimally effective or effective, whereas 22 percent of leavers from medium-poverty schools and 10 percent of leavers from low-poverty schools were minimally effective or effective. Many of the most effective teachers who were not retained in DCPS exited from low-poverty schools; of the highly effective teachers not retained, 45 percent exited from low-poverty schools.

**Teachers who stayed at their schools were more effective on average than teachers who left.** In all types of schools, stayers had higher average IMPACT scores than movers or leavers. For example, teachers who remained in their low-poverty schools achieved an average IMPACT score of 327, which was higher than the average score of 296 for movers from these schools and higher than the average score of 304 for teachers who left DCPS from these schools (first column of second panel of Table 4). The stayers in medium- and low-poverty schools were also more effective on average than movers and leavers, although all averages were lower for teachers in these schools.

Dismissals of minimally effective or ineffective teachers alone cannot explain the difference in the rate of leavers between medium- and high-poverty schools. Whereas medium-poverty schools retained more of their teachers, teachers in medium-poverty schools are not substantively more effective than those in low-poverty schools (Table 3). One possibility is that teachers in high-poverty schools may be more likely to leave DCPS because of challenging working conditions in their schools.

**Table 4. Amount of Teacher Turnover and Effectiveness of Teachers by Mobility Category and School Poverty in DCPS, 2010–2011 School Year**

	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
Percentage				
Stayers	83.0%	83.3%	61.6%	74.9%
Movers	3.8%	7.5%	6.0%	6.0%
Leavers	13.2%	9.2%	32.4%	19.1%
Total	100.0%	100.0%	100.0%	100.0%
Average 2009–2010 IMPACT Score				
Stayers	327	299	294	304
Movers	296	283	289	287
Leavers	304	278	260	270
Number of Teachers	802	1,312	1,327	3,441

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes the 3,416 Group 1 through 8 teachers in the 2009–2010 school year teaching in a school for which school poverty rates were available. Teachers in the “stayers” category continue teaching at the same school, “movers” transfer to a different school within the district, and “leavers” leave teaching in the district. These categories are based on changes in teaching assignments between the 2009–2010 and 2010–2011 school years. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible.

Evidence suggests that DCPS has room to improve if an equitable distribution of teacher effectiveness, as measured by IMPACT, is a goal for the district. On average, teachers in high-poverty schools received lower IMPACT scores than teachers in low-poverty schools, and teachers in high-poverty schools were more likely to leave DCPS. Over time, IMPACT may help distribute teachers more equitably across schools as ineffective teachers in high-poverty schools are dismissed or replaced and highly effective teachers take advantage of incentives to remain in DCPS. In the meantime, high-poverty schools have fewer highly effective teachers and experience the most turnover. Additionally, some effective teachers leave high-poverty schools by moving to other DCPS schools.

### 3. Principal Experience and Tenure

**Most principals had 3 or fewer years of experience in DCPS.** Of the 113 principals leading a DCPS school in 2010–2011, 27 percent had one year of experience, and 37 percent had 2 or 3 years of experience in DCPS (Table 5). The remaining 36 percent had 4 or more years of experience. Of the most experienced

principals, 10 had led schools in DCPS for 10 or more years.<sup>6</sup> Principals did not typically move between schools. Only 2 of the 113 DCPS principals in 2010–2011 taught in more than one school between the 2000–2001 and 2010–2011 school years.

**Table 5. Principal Experience in DCPS, 2010–2011 School Year**

Years of Experience in DCPS	Number of Principals	Number as Proportion of All DCPS Principals
1 year	31	27.4%
2 to 3 years	42	37.2%
4 to 6 years	22	19.5%
More than 6 years	18	15.9%
All Principals	113	100%

**Source:** Mathematica calculations based on administrative data from DCPS.

**Note:** Experience in DCPS is the number of years the principal led any DCPS school, including the 2010–2011 school year.

**Principals in high-poverty schools were more likely to have the least experience in DCPS than principals in medium- or high-poverty schools.**

Whereas 5 percent of principals in low-poverty schools were first-year principals in DCPS, 32 percent of principals in medium-poverty schools and 33 percent in high-poverty schools were first-year DCPS principals (Table 6). The higher proportion of first-year principals in high-poverty schools reflects a lower proportion of principals with moderate levels of experience.

**Principals in medium- and high-poverty schools were less likely than principals in low-poverty schools to have between four and six years of experience.** Forty-three percent of principals in low-poverty schools had four to six years of experience in DCPS compared to 14 percent of principals in medium-poverty schools and 16 percent of principals in low-poverty schools.

In contrast, the proportions of principals with more than six years of experience were similar across the three groups of schools. Of principals in low-poverty schools, 14 percent had more than six years of experience, as did 18 percent of principals in medium-poverty schools and 13 percent of principals in high-poverty schools.

<sup>6</sup> The distribution of experience in DCPS is consistent with principal experience in other urban districts such as New York City (Clark, Martotell, & Rockoff, 2009), and in the state of North Carolina (Dhuey & Smith, 2012b), although principals in Texas are more experienced on average (Branch, Hanushek, & Rivkin, 2012).

**Table 6. Principal Experience by School Poverty, 2010–2011 School Year**

Years of Experience in DCPS	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
1 year	4.8%	31.8%	33.3%	27.3%
2 to 3 years	38.1%	36.4%	37.8%	37.3%
4 to 6 years	42.8%	13.6%	15.6%	20.0%
More than 6 years	14.3%	18.2%	13.3%	15.4%
Total	100.0%	100.0%	100.0%	100.0%
Number of Principals	21	44	45	110

Source: Mathematica calculations based on administrative data from DCPS.

Notes: Experience in DCPS is the number of years the principal led any DCPS school.

School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible. The table excludes principals in three schools for which FRPL eligibility was not available.

Evidence for the distribution of experienced principals across schools is similar to our results for the distribution of effective teachers. Principals in high-poverty schools were more likely to be those with the least experience in DCPS. If the most experienced principals are also the most effective, then more of the most effective principals in DCPS are leading low-poverty schools. Our conclusions are limited, however, because principal experience is not a precise measure of effectiveness.

### ***Questions for Further Analysis***

The use of IMPACT raises a number of important questions.

With respect to teachers:

- What is the estimated extent of misclassification, i.e., the degree to which teachers retained based on IMPACT may be less effective than predicted and the degree to which teachers dismissed based on IMPACT would have been effective in reality?
- To what extent does IMPACT measure teacher *improvement* over time? Are there differences across schools in how much teachers hired since IMPACT improve with experience?
- What are the possible reasons that teachers in high-poverty schools received lower IMPACT scores than teachers in low-poverty schools, and that teachers in high-poverty schools appear to be more mobile?
- As DCPS hires more effective teachers (as measured by IMPACT) into low-poverty schools, do retention rates in these schools increase?
- Have the gaps in teacher effectiveness (as measured by IMPACT) between schools widened or narrowed since the development and implementation of this particular approach to measuring teacher effectiveness?
- What policies and practices influence teachers with different degrees of effectiveness (as measured by IMPACT) to work in high-poverty schools?
- Are results consistent across different measures of teacher effectiveness, including those not included in IMPACT?

With respect to principals:

- What are likely reasons for the observation that most principals in 2010–2011 had three or fewer years of experience in DCPS, nearly all principals had led only one DCPS school, and principals in high-poverty schools were more likely to be those with the least experience in DCPS?

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## **Technical Appendix to Section II: Data and Analysis**

We relied on data provided by DCPS that include (1) IMPACT scores and effectiveness categories for all DCPS teachers in the 2009–2010 and 2010–2011 school years, (2) a list of teachers teaching in the 2008–2009 school year, (3) principals’ school assignments for the 2000–2001 through 2010–2011 school years, and (4) individual student background characteristics.

We calculated teacher experience and retention rates by linking teachers across years in the IMPACT data to the 2008–2009 teacher list. The IMPACT data include all teachers in IMPACT Groups 1 through 8. If a teacher was not listed in consecutive IMPACT files, we assumed that the teacher was not retained for the second year. These files include teachers only; that is, teachers not retained for the second year may include some who assumed administrative roles. We distinguished new teachers and second-year teachers from all other returning teachers by linking teachers across consecutive years in the data.

New teachers in the 2010–2011 school year were those not teaching during the 2009–2010 school year. Second-year teachers taught during the 2009–2010 school year, but not during the previous year. All other returning teachers taught during both the 2008–2009 and 2009–2010 school years.

Our approach reflects the best data available to us, yet we recognize that teachers on leave for the 2009–2010 or 2008–2009 school years are misclassified as new or second-year teachers.

We defined low-, medium-, and high-poverty schools based on the proportion of students eligible for free or reduced-price lunch (FRPL) within the school. We used student background characteristics for the 2010–2011 school year to calculate students’ poverty status. We classified schools with less than 60 percent of students with FRPL status as low-poverty schools and those with more than 80 percent of students with FRPL status as high-poverty schools. According to these definitions, 22 percent of DCPS schools are classified as low poverty, 40 percent as medium poverty, and 38 percent as high poverty.

Alternatively, 26 percent of DCPS students attend low-poverty schools, 41 percent attend medium-poverty schools, and 33 percent attend high-poverty schools. Some DCPS schools—called Provision 2 schools—did not collect FRPL eligibility for individual students in the 2010–2011 school year. In such cases, we used the FRPL status of students from a previous year in which FRPL status was collected, typically the 2009–2010 school year. If a student’s FRPL status was unknown in the 2009–2010 year, we retained the student’s 2010–2011 status as reported in the background data, although the status from that year may not reflect the student’s actual status.

We calculated principal experience and tenure in a school by using the data on principal school assignments. In several cases, two schools were combined into a single school as a result of school closures. In these cases, we treated both schools in the pair as the same school. Consequently, if a principal led a school that was combined and continued to lead the combined school in 2010–2011, then the principal's tenure in the combined school includes the school years before the year in which the schools were combined.

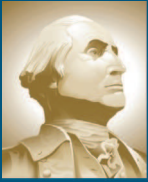
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## **Evaluation of the DC Public Education Reform Amendment Act (PERAA)**

September 9, 2013

The Education Consortium for Research and Evaluation (EdCORE)



THE GEORGE  
WASHINGTON  
UNIVERSITY  
WASHINGTON, DC

*EdCORE*  
The Education Consortium for Research and Evaluation

# Evaluation of the DC Public Education Reform Amendment Act (PERAA)

Report No. 2: School Year 2011-2012  
Submitted to the DC Auditor  
September 6, 2013

Report No. 1: School Year 2010-11  
July 1, 2013

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## **About EdCORE**

EdCORE is a consortium led by the Graduate School of Education and Human Development of the George Washington University in partnership with American Institutes for Research (AIR), Mathematica Policy Research, Inc. (MPR), Policy Studies Associates (PSA), Quill Research Associates, and RAND.

EdCORE was established in 2012, in response to the National Research Council's recommendation for a sustainable program of independent research and evaluation.\* Our mission is to provide objective and reliable evidence to inform continuous improvement of public education, at all levels, in the District of Columbia.

The current EdCORE portfolio, of which this PERAA report series is a part, includes research on changes in special education policies; and science, technology, engineering, and mathematics (STEM) course taking in DC schools. Future studies of teaching, learning, and school governance are planned.

\* See: National Research Council, *A Plan for Evaluation the District of Columbia's Public Schools: From Impressions to Evidence*, Washington: National Academies Press, 2011.

## Foreword

This EdCORE report is the second in a series responding to the mandate for independent evaluation included in the District of Columbia's Public Education Reform Amendment Act (PERAA) of 2007. It includes selected "snapshot" data from the school year 2011-2012 and more comprehensive information about Academic Plans during the period since PERAA's enactment.

These reports are prepared by EdCORE under a subcontract to the National Academy of Sciences (NAS), which will use the information in preparing a final evaluation report due to be issued in Fall 2014. The summative report will be written by the NAS Committee for the Five Year (2008-2013) Summative Evaluation of the District of Columbia Public Schools.

As explained in our first report, each one in this series provides an annual snapshot of selected events and indicators along with a trend analysis of one or more of the four broad topics mentioned in PERAA and further refined by the DC Auditor:

- *Business practices and strategies*, including organizational structure and roles, financial management, operations management, facilities and maintenance; resource allocations; public accountability; interagency collaboration; and stakeholder engagement and responsiveness.
- *Human resources operations and human capital strategies*, including the number (and percentage) of highly qualified teachers; retention rate for effective teachers; schools and wards served by effective teachers; length of time principals and administrators serve; types of leadership strategies used; and responsibilities of central office versus school level leadership.
- *Academic plans*, including integration of curriculum and program specific focus into schools and grade progression and credit accumulation.
- *Student achievement*, including a description of student achievement that includes academic growth; proficiency; and other (non-academic) educational outcomes.

In accordance with a request from the DC Auditor on behalf of the DC government, as specified in its contract with the National Academy of Sciences (NAS), this second report pertains primarily to the 2011-2012 school year and provides trend analysis focused on **Academic Plans**.

We repeat the caution expressed in the first report: though informative, the data presented here are not sufficient to fully describe PERAA implementation or infer trends or their causes. In other words, it would be imprudent to assume any linear trends or to attribute observed differences between 2007 and 2012 to the enactment and implementation of PERAA. Causal inferences of this sort cannot be established without substantially more

information and statistical analysis. As a further reminder, we note that questions concerning the integrity of test score data during the period 2008-2012 make it imperative to view results that pertain to student achievement with caution. A more thorough analysis of the student test data is planned for a subsequent report in this series.

In addition to the direct support of the DC government through the NAS, the work reported here was supported indirectly by funds from a combination of public and private organizations that have helped create and build the EdCORE consortium. The National Science Foundation, an early supporter of the consortium as an innovation in the evaluation of urban education reform, provided a grant for general support and in-depth analysis of STEM course taking (which is not part of the PERAA mandate and is not covered in this series of reports). We are grateful to Janice Earle and her colleagues for their enthusiastic help.

We also wish to thank GW Vice President for Research, Leo Chalupa, and Provost Steven Lerman, for their institutional support, without which it would not have been possible to fulfill the demands of the PERAA evaluation and related activities. Current and past faculty of the Graduate School of Education and Human Development (GSEHD), including Rebecca Thessin, Sam Steen, Josh Glazer and Marian Robinson provided important input at various stages of the consortium's development. Taunya Nesin has been an extraordinary graduate research assistant.

In addition, we thank the American Institutes for Research (AIR), and David Myers, its President, for continued support—through grants and in-kind contributions. Former AIR President Sol Pelavin was an enthusiastic supporter of the concept and early work of the National Research Council study, for which we continue to be thankful. We wish to acknowledge also Katherine Bradley (CityBridge Foundation), and Judy and Peter Kovler for their generous financial support. Other members of the GSEHD National Council, in particular Elizabeth Perry, Ed Vest, and Gene Rotberg, are avid supporters of all our work.

We are especially grateful to our colleagues at the NAS – Stuart Elliott, Alix Beatty, committee co-chairs Lorraine McDonnell and Carl Cohn along with the members of their committee – for their confidence in EdCORE and for their wise counsel on matters technical and stylistic. Their comments on earlier drafts of the report contributed to its improvement, but EdCORE remains solely responsible for its contents.

Finally we wish to thank DC Auditor Yolanda Branche and Deputy Auditor Lawrence Perry for their consummate professionalism and gracious management of the contracting process.

This report was written by a team from EdCORE. Brenda Turnbull, Principal of Policy Studies Associates, with researchers Erikson Arcaira, Stephen Coleman, Jaclyn MacFarlane, and Andrea Palmiter, led the analysis of business practices and strategies (section 1) and academic plans (section 3). Elias Walsh, Researcher at Mathematica Policy Research, with Steven Glazerman, Senior Fellow, took the lead on human resources operations and human



capital strategies (section 2). Umut Ozek and Erin Dunlop, researchers at the AIR/National Center for Analysis of Longitudinal Data in Education Research (CALDER), with Jane Hannaway, Vice President, analyzed the student test data (section 4). Beatrice Birman (AIR) and Jennifer Steele (RAND) provided invaluable commentary and editorial contributions. Maxine Freund and Taunya Nesis (GW) provided technical, logistical, and conceptual support at all phases of the work. The deft handling of contractual matters by Viola Horek (of the NRC) and Christine Tomasik and Charles Maples (of GW) is much appreciated.

We thank the EdCORE partners for their patience, perseverance, and extraordinary contributions of time and energy. They are exemplars of the very finest and most generous traditions of social scientists coming together for the public good.

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## Section II

### Human Resources Operations And Human Capital Strategies, School Year 2011–2012

This section addresses PERAA’s requirement for periodic assessments of the Act’s impact in the area of human resources and human capital strategies. The first report evaluating PERAA (EdCORE, 2013) described DCPS’s human resources and human capital strategies during the 2010–2011 school year. This section updates that description for the 2011–2012 school year. In many cases, our findings for this school year mirror findings from the first report. When the data reflect changes between the two school years, we discuss the differences and refer to results from the first report. Although the results for these two school years may be suggestive of the condition of DCPS more generally after PERAA’s passage in 2007, they cannot necessarily be attributed to policy changes as a result of PERAA.

Our analysis of DCPS human resources and human capital strategies addresses questions from the DC Auditor under three topic areas, as required by PERAA (see the Technical Appendix for methodological details):

1. **Retention of effective teachers.** Did DCPS retain its most effective teachers? How effective are teachers who are new to DCPS relative to more experienced teachers?
2. **Distribution of effective teachers.** Are students in high-poverty schools more or less likely to be taught by effective teachers? Are teachers’ decisions to remain at their school from one year to the next related to the percentage of students from low-income households at that school?
3. **Experience of principals.** How many years of experience within DCPS does the typical DCPS principal have? Is principal experience related to the percentage of students from low-income households at that school?

As in the previous report for the 2010–2011 school year, we measure teacher effectiveness using scores from the IMPACT system for teacher performance evaluation in DCPS. (The box below provides an overview for the 2011–2012 school year—the third year of IMPACT.) The previous report included a discussion of limitations to using IMPACT scores as our measure of teacher effectiveness, including misclassification error and possible breaches in test security. Although these limitations are important considerations for interpreting the results, the IMPACT score was specifically designed to evaluate DCPS teachers.

Also as in the previous report, we use principal experience to measure principal effectiveness. Most previous research has found a positive relationship between experience and direct estimates of principal contributions to student achievement; however,

experience is not a precise measure of effectiveness.<sup>1</sup> Principal contributions to student achievement are difficult to distinguish from other school-level contributions to student achievement (Lipscomb, Chiang, & Gill, 2012). A rigorous approach to measuring principals' contributions to student achievement would be to measure the change in student achievement when there is a change in school leadership; however, it is not possible to apply this strategy to measuring the effectiveness of DCPS principals, because nearly all principals lead only a single school in DCPS.

### **IMPACT: The DCPS Effectiveness Assessment System**

Teachers receive annual evaluation scores under IMPACT that are used to make retention and performance pay decisions. The composition of a teacher's IMPACT score is based on that teacher's IMPACT group. For the 2011–2012 school year, Group 1 consisted of general education teachers of math and reading in grades 4 through 8, the grades for which test score data are needed to calculate teacher "value added"—a measure of teacher effectiveness that seeks to isolate how much a teacher contributes to student achievement from any confounding factors outside the teacher's control (Isenberg & Hock, 2012). Group 2 included all other general education teachers. Groups 3 through 7 included non-general education teachers such as special education and English-language-learner teachers.

Most teachers received an IMPACT evaluation score composed of (1) evaluations by school administrators and third-party trained observers using a classroom observation rubric; (2) an individual value-added (IVA) measure of student achievement growth for Group 1 or an alternative measure based on achievement targets determined by the teacher and principal for most other teachers; (3) a principal-assessed measure of the teacher's collaboration with colleagues and support of school initiatives and programs; (4) a principal-assessed measure of the teacher's attendance, adherence to school policies, and professionalism; and (5) a school value-added score.

The weights for each component in the total score depended on a teacher's IMPACT group. In the 2011–2012 school year, the IVA score constituted 50 percent of the total evaluation score for Group 1 teachers. For all groups, the total evaluation score ranged from 100 to 400 points. Based on this score, a teacher received one of four possible effectiveness ratings: highly effective (350 to 400 points), effective (250 to 349 points), minimally effective (175 to 249 points), or ineffective (100 to 174 points). Under IMPACT, teachers who earn a highly effective rating receive performance pay and those who earn an ineffective rating in one year or a minimally effective rating for two consecutive years are dismissed. The amount of performance pay highly effective teachers receive is twice as large for teachers in schools where at least 60 percent of students are eligible for free or reduced-price lunch (FRPL); bonuses can be as large as \$25,000 for Group 1 teachers. For the 2011–2012 school year, most teachers were in Group 1 or 2: 13 percent of teachers were in Group 1, and 50 percent of teachers were in Group 2.

### Retention and Experience of Effective Teachers in DCPS

**DCPS retained over 80 percent of teachers classified as effective or highly effective by IMPACT.<sup>2</sup> Overall, 78 percent of 2010–2011 teachers in DCPS were retained for the**

<sup>1</sup> Previous work has shown that more experienced principals make greater contributions to student achievement (Clark, Martorell, & Rockoff, 2009; Branch, Hanushek, & Rivkin, 2012; Dhuey & Smith, 2012b), though some studies have not confirmed a link between experience and principal effectiveness (Buck, 2012; Dhuey & Smith 2012a).

<sup>2</sup> Retention rates do not distinguish between teachers dismissed under IMPACT and teachers who exited voluntarily; for example, some teachers may have left to assume administrative roles. Our data do not allow us to track teachers into administrative roles.

2011–2012 school year (bottom row in first panel of Table II.1). DCPS retained 88 percent of teachers in the highly effective category and 84 percent in the next-highest IMPACT category, effective.<sup>3</sup>

Teachers with IVA scores—called Group 1 teachers—classified as highly effective were less likely to be retained compared to non-Group 1 teachers. The retention rate for teachers without IVA scores (Groups 2 through 7) classified as highly effective was 89 percent, 12 percentage points higher than the rate for highly effective Group 1 teachers (first row in the bottom two panels of Table II.1). However, this difference may be due to chance rather than a substantive difference in retention outcomes; only 17 Group 1 teachers were classified as highly effective, so retaining even one more Group 1 teacher would increase the retention rate from 77 percent to 82 percent. Consistent with an important role for chance, the retention rate for highly effective non-Group 1 teachers for the 2010–2011 school year was 8 percentage points *lower* than for Group 1 teachers. (Tables from the 2010–2011 report are provided in an appendix to this report for reference.)

**DCPS retained fewer than half of teachers classified as minimally effective by IMPACT and only one teacher classified as ineffective.** DCPS retained 48 percent of minimally effective teachers and one of the 65 ineffective teachers for 2011–2012.<sup>4</sup> The lower retention rates for minimally effective and ineffective teachers are consistent with the DCPS IMPACT policy that teachers in the minimally effective category for two consecutive years or in the ineffective category for a single year are subject to separation.

Group 1 teachers classified as minimally effective were more likely to be retained than non-Group 1 teachers. Retention rates for teachers in these IMPACT groups who were rated minimally effective were 46 percent for non-Group 1 teachers, and 51 percent for Group 1 teachers (third row in the bottom two panels of Table II.1). This 5 percentage point difference is similar to the 8 percentage point difference for 2010–2011.

**Retention of highly effective teachers was similar for the 2011–2012 school year and for the 2010–2011 school year.** The rate of retention for highly effective teachers was 89 percent for the 2010–2011 school year, and 88 percent for 2011–2012.

**Retention of minimally effective teachers was lower for the 2011–2012 school year than for the 2010–2011 school year.** DCPS retained 70 percent of minimally effective 2009–2010 teachers, compared to 48 percent of minimally effective 2010–2011 teachers. Teachers received their second IMPACT score in the 2010–2011 school year, so DCPS could base its retention decisions on two years of IMPACT data for the first time at the end of that school year. Thus, the lower rate of retention for minimally effective 2010–2011 teachers reflects additional separations among this first cohort of teachers who could have received

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<sup>3</sup> Some differences in outcomes presented in this report, including for retention, may not be large enough to provide strong evidence of true differences. That is to say, differences that appear substantive may not always reflect differences that are statistically significant.

<sup>4</sup> The one ineffective teacher who was retained was among 78 teachers with incomplete ratings. These teachers received IMPACT ratings but were exempt from any associated consequences.

IMPACT scores in the minimally effective category for two consecutive years. Specifically, 124 of the minimally effective 2010–2011 teachers received the same rating in 2009–2010; only 2 of these teachers with minimally effective ratings in consecutive years were retained for the 2011–2012 school year.

**Table II.1. Retention of Effective Teachers in DCPS, 2011–2012 School Year**

2010–2011 IMPACT Rating	Number of Teachers	Number Retained	Proportion Retained for 2011–2012 School Year
Groups 1 Through 7 (all teachers)			
Highly effective (350 to 400 points)	488	431	88.3%
Effective (250 to 349 points)	2,428	2,038	83.9%
Minimally effective (175 to 249 points)	500	238	47.6%
Ineffective (100 to 174 points)	65	1	1.5%
All IMPACT ratings	3,481	2,708	77.8%
Group 1 (teachers with IVA scores)			
Highly effective (350 to 400 points)	17	13	76.5%
Effective (250 to 349 points)	308	257	83.4%
Minimally effective (175 to 249 points)	133	68	51.1%
Ineffective (100 to 174 points)	13	0	0.0%
All IMPACT ratings	471	338	71.8%
Groups 2 Through 7 (teachers without IVA scores)			
Highly effective (350 to 400 points)	471	418	88.7%
Effective (250 to 349 points)	2,120	1,781	84.0%
Minimally effective (175 to 249 points)	367	170	46.3%
Ineffective (100 to 174 points)	52	1	1.9%
All IMPACT ratings	3,010	2,370	78.7%

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes all 3,481 Group 1 through 7 teachers in the 2010–2011 school year. Teachers are considered to have exited DCPS if they did not receive an IMPACT score in Groups 1 through 7 in the 2011–2012 school year.

**More experienced DCPS teachers received higher IMPACT scores on average than less experienced teachers.** In the 2011–2012 school year, 10 percent of new teachers, 20 percent of second-year teachers, and 26 percent of other returning teachers achieved ratings of highly effective (first column of Table II.2).<sup>5</sup> The IMPACT scores also reflected the relationship between IMPACT ratings and experience. The average IMPACT score for new teachers was 289 points; the same averages were 313 points for second-year teachers and 317 for other returning teachers (bottom row of Table II.2). More experienced teachers were also more effective on average in the 2010–2011 school year. In both years, most teachers new to DCPS were rated effective or highly effective, although they were less effective on average than more experienced teachers.

<sup>5</sup> Previous research has demonstrated that teachers tend to improve in their first few years of teaching (Rockoff, 2004; Hanushek et al., 2005; Harris & Sass, 2010).

Novice teachers may be less effective than veteran teachers, but they could nonetheless become more effective over time. The higher effectiveness of second-year teachers relative to new teachers could reflect the growth in effectiveness attributable to experience, differences in the quality of the two cohorts of new hires, or both.<sup>6</sup> Understanding trends in teacher effectiveness over time—especially for new teachers—is an important topic for future research.

**Table II.2. Effectiveness of New and Returning Teachers to DCPS, 2011–2012 School Year**

2011–2012 IMPACT Rating	New Teachers		Second-Year Teachers		All Other Returning Teachers	
	Number of Teachers	Proportion of All New Teachers	Number of Teachers	Proportion of All Second-Year Teachers	Number of Teachers	Proportion of All Other Returning Teachers
Highly effective (350 to 400 points)	77	10.4	95	19.7	567	25.5
Effective (250 to 349 points)	528	71.0	349	72.4	1,480	66.4
Minimally effective (175 to 249 points)	114	15.3	34	7.1	167	7.5
Ineffective (100 to 174 points)	25	3.3	4	0.8	13	0.6
All Teachers	744	100.0	482	100.0	2,227	100.0
Average 2011–2012 IMPACT Score	289		313		317	

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes all 3,453 Group 1 through 7 teachers in the 2011–2012 school year. New teachers in the 2011–2012 school year did not teach during the 2010–2011 school year. Second-year teachers taught during the 2010–2011 school year but not in 2009–2010. All other returning teachers taught during both the 2009–2010 and 2010–2011 school years.

Our conclusion based on data from the 2011–2012 school year is the same as that from the 2010–2011 school year. Relationships between teacher retention, experience, and effectiveness are consistent with progress on the IMPACT system’s primary goal: to improve the effectiveness of DCPS teachers. DCPS retains teachers identified by IMPACT as being the most effective at a higher rate than it does less effective teachers.

No measure of teacher effectiveness is perfect, however. Thus, some teachers may be misclassified. To the extent that IMPACT misclassifies teachers, those retained by DCPS may be less effective and dismissed teachers more effective than our results indicate. Additionally, the IVA component of some teachers’ IMPACT scores may be affected by compromised test scores, though DCPS has stated that they have not found evidence of widespread cheating.

<sup>6</sup> A simple comparison of IMPACT scores for new teachers in 2010–2011 to second-year teachers in 2011–2012 would not measure growth in effectiveness because there is no guarantee that these scores are comparable on a year-to-year basis.



We also found that over 80 percent of new teachers hired to replace the teachers who left DCPS earned ratings of effective or highly effective. However, even though most new teachers to DCPS received high IMPACT ratings, their IMPACT scores indicated that these teachers were on average less effective than their more experienced colleagues; over 90 percent of the more experienced teachers scored effective or highly effective. The district's success in improving teacher effectiveness may depend on whether and how much new teachers improve over time.

### Distribution of Effective DCPS Teachers

Access to effective teachers in DCPS may be related to poverty at the individual student or school level. Recent work has shown that disadvantaged students may be less likely to be taught by the most effective teachers (Tennessee Department of Education, 2007; Hahnel & Jackson, 2012), although some studies have shown that disadvantaged students do not always have less access to effective teaching, depending on districts or grade levels studied (Glazerman & Max, 2011; Sass et al., 2012).

To the extent that unequal access to effective teachers poses a challenge in DCPS, dismissal and performance pay incentives under IMPACT may help equalize access over time. For example, through IMPACT, DCPS offers monetary incentives that may induce highly effective teachers to teach in designated high-poverty schools at the same time DCPS is dismissing ineffective teachers. Such incentives could improve the average quality of teachers overall in DCPS as well as the quality of teachers in high-poverty schools. If high-poverty schools had the highest concentrations of ineffective teachers before IMPACT, then these schools may see the most teacher turnover as a result of IMPACT, a hypothesis we examine below.

**On average, teachers in high-poverty schools received lower IMPACT scores than teachers in low-poverty schools.** We classified schools as low, medium, or high poverty based on the percentage of students who were eligible for free or reduced-price lunch: below 60 percent, between 60 and 80 percent, or greater than 80 percent, respectively. Consistent with results from the 2010–2011 school year, we found that on average teachers in low-poverty schools were more likely to earn ratings of highly effective and receive higher IMPACT scores for 2011–2012. Thirty-eight percent of teachers in low-poverty schools received highly effective ratings, whereas only 17 percent in medium-poverty schools and 12 percent in high-poverty schools achieved highly effective ratings (first row of Table II.3). The average teacher in a low-poverty school received an IMPACT score of 329 points (second panel of Table II.3); by contrast the average score was 21 points lower for teachers in medium-poverty schools and 31 points lower for teachers in high-poverty schools. These gaps were 31 and 33 points for the 2010–2011 school year. Thus, the gap between the medium- and high-poverty schools rose from 2 points for the 2010–2011 school year to 10 points for 2011–2012, whereas the gap between low- and high-poverty schools decreased by 2 points.



**Table II.3. Teacher Effectiveness by School Poverty in DCPS, 2011–2012 School Year**

	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
Percentage of Teachers with a 2011–2012 IMPACT Rating of:				
Highly effective (350 to 400 points)	37.8	17.2	12.3	20.4
Effective (250 to 349 points)	56.8	72.9	73.5	69.0
Minimally effective (175 to 249 points)	4.8	8.9	12.4	9.3
Ineffective (100 to 174 points)	0.6	1.0	1.8	1.3
Total	100.0	100.0	100.0	100.0
Average 2011–2012 IMPACT Score	329	308	298	309
Number of Teachers	856	1,079	1,410	3,345

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes the 3,345 Group 1 through 7 teachers in the 2011–2012 school year teaching in a school for which school poverty rates were available. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible.

**Teachers in high-poverty schools were less likely than teachers in medium- or low-poverty schools to remain in the same school, though this gap was narrower in the 2011–2012 school year than in 2010–2011.** In the top panel of Table II.4, we show the proportion of teachers in low-, medium-, and high-poverty schools who remained in the same school (“stayers”), moved between two schools (“movers”), and left DCPS between these years (“leavers”). These categories are based on transitions between the 2010–2011 and 2011–2012 school years. Whereas 78 percent of teachers in low- and medium-poverty schools remained in the same school from one year to the next, only 67 percent of teachers in high-poverty schools did so (first row of Table II.4). The difference reflects higher proportions of teachers in high-poverty schools moving to a new DCPS school (second row of Table II.4) or leaving DCPS (third row of Table II.4). The gap of 11 percentage points for the 2011–2012 school year represents a reduction by almost half from the gap for 2010–2011 (21 percentage points). The narrower gap for 2011–2012 is due to there being more leavers in low-poverty schools and fewer in high-poverty schools. Although there could be other explanations, the decline in the rate of leavers in high-poverty schools is consistent with incentives from additional performance pay for highly effective teachers to remain in these schools: highly effective teachers in medium- and high-poverty schools receive twice the performance pay of highly effective teachers in low-poverty schools.

**Teachers in high-poverty schools who left were rated less effective, on average, than teachers who left medium- or low-poverty schools.** The higher proportion of leavers in high-poverty schools relative to low-poverty schools could reflect an effort to dismiss the least effective teachers; as shown in Table II.3, high-poverty schools tend to have less effective teachers. We show in the second panel of Table II.4 that the teachers who left DCPS from high-poverty schools had an average IMPACT score of 253. By comparison, leavers from medium-poverty schools had an average score of 265, and those leaving low-poverty schools had an average score of 286. Not all exits from low-poverty schools result

from dismissals—a score of 253 is still 3 points above the threshold for a being rated effective rather than minimally effective. Even so, 52 percent of leavers from high-poverty schools were minimally effective or ineffective, whereas 36 percent of leavers from medium-poverty schools and 29 percent of leavers from low-poverty schools were minimally effective or ineffective. Many of the most effective teachers who were not retained in DCPS exited from low-poverty schools; of the highly effective teachers not retained, 42 percent exited from low-poverty schools. These findings are similar to those from the 2010–2011 school year.

**Teachers who stayed at their schools were rated more effective, on average, than teachers who left.** Similar to results from the 2010–2011 school year, stayers had higher average IMPACT scores than movers or leavers in all types of schools. For example, teachers who remained in their low-poverty schools achieved an average IMPACT score of 326, which was higher than the average scores of both 314 for movers from these schools and 286 for teachers who left DCPS from these schools (first column of second panel of Table II.4). The stayers in medium- and low-poverty schools were also more effective, on average, than movers and leavers, although all averages were lower for teachers in these schools.

**Table II.4. Amount of Teacher Turnover and Effectiveness of Teachers by Mobility Category and School Poverty in DCPS, 2011–2012 School Year**

	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
Percentage				
Stayers	78.3	70.1	67.4	71.0
Movers	4.8	6.1	8.1	6.7
Leavers	16.9	23.8	24.5	22.3
Total	100.0	100.0	100.0	100.0
Average 2010–2011 IMPACT Score				
Stayers	326	302	297	306
Movers	314	290	273	286
Leavers	286	265	253	263
Number of Teachers				
	830	1,035	1,441	3,306

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes the 3,337 Group 1 through 7 teachers in the 2010–2011 school year teaching in a school for which school poverty rates were available. Teachers in the “stayers” category continue teaching at the same school, “movers” transfer to a different school within the district, and “leavers” leave teaching in the district. These categories are based on changes in teaching assignments between the 2010–2011 and 2011–2012 school years. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible.

Evidence suggests that DCPS has room to improve if an equitable distribution of teacher effectiveness, as measured by IMPACT, is a goal for the district. Although the gap in retention rates between high- and low-poverty schools narrowed between the 2010–2011

and 2011–2012 school years, the gap in effective teaching decreased by only two IMPACT points. High-poverty schools continued to have fewer highly effective teachers and experience the most turnover. Although not the case for these two school years, over time, IMPACT may help distribute teachers more equitably across schools, as ineffective teachers in high-poverty schools are dismissed or replaced and highly effective teachers take advantage of incentives to remain in DCPS.

### Principal Experience

**Principals in DCPS were more experienced in the 2011–2012 school year than in 2010–2011.** Of the 112 principals leading a DCPS school in 2011–2012, 22 percent were new principals in DCPS and 31 percent had just two or three years of experience as principals in DCPS (Table II.5). The remaining 46 percent had four or more years of experience leading a school (sum of the third and fourth rows in Table II.5). In contrast, only 35 percent of 2010–2011 principals had at least four years of experience.

**More principals in low-poverty schools were new to DCPS in 2011–2012 than in 2010–2011.** In 2011–2012, almost half of new principals were hired into low-poverty schools and these new principals represented 32 percent of principals in low-poverty schools (first column of Table II.6). For the 2010–2011 school year, new principals composed just 5 percent of principals in low-poverty schools, despite a similar proportion of new principals to DCPS across all schools.

**In the 2010–2011 school year, principals in high-poverty schools were more likely to have the least experience in DCPS than principals in low-poverty schools, but this was not the case in 2011–2012.** In the 2011–2012 school year, 26 percent of principals in high-poverty schools were first-year DCPS principals, 6 percentage points *lower* than the percentage for low-poverty schools (first row of Table II.6). For 2010–2011, the percentage of first-year DCPS principals in high-poverty schools was 28 percentage points *higher* than the percentage for low-poverty schools. Leaders of high-poverty schools for 2011–2012 were also more likely to have the most experience in DCPS relative to that group of leaders in 2010–2011; whereas 24 percent of principals in high-poverty schools had more than six years of experience in DCPS in 2011–2012, just 13 percent of these principals had that amount of experience in 2010–2011.

**Although principals in medium-poverty schools were more likely to have the most experience in DCPS than those in either low- or high-poverty schools in the 2010–2011 school year, we found the opposite pattern in 2011–2012.** Of principals in low-poverty schools in 2011–2012, 27 percent had more than six years of experience, compared to 11 percent in medium-poverty schools, and 24 percent in high-poverty schools (last row of Table II.6). For the 2010–2011 school year, these percentages were 14, 18, and 13 respectively. Medium-poverty schools in 2011–2012 were also less likely to have principals with four or more years of experience in DCPS relative to low- and high-poverty schools; whereas 59 percent of principals in low-poverty schools had this amount

of experience, the percentages were 36 percent in medium-poverty schools and 45 percent in high-poverty schools.

**Table II.5. Principal Experience in DCPS, 2011–2012 School Year**

Years of Experience in DCPS	Number of Principals	Number as Proportion of All DCPS Principals
1 year	25	22.3
2 to 3 years	35	31.3
4 to 6 years	27	24.1
More than 6 years	25	22.3
All Principals	112	100.0

Source: Mathematica calculations based on administrative data from DCPS.

Notes: Experience in DCPS is the number of years the principal led any DCPS school, including the 2011–2012 school year.

**Table II.6. Principal Experience by School Poverty, 2011–2012 School Year**

Years of Experience in DCPS	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
1 year	31.8	10.7	25.9	23.2
2 to 3 years	9.1	53.6	29.3	31.5
4 to 6 years	31.8	25.0	20.7	24.1
More than 6 years	27.3	10.7	24.1	21.3
Total	100.0	100.0	100.0	100.0
Number of Principals	22	28	58	108

Source: Mathematica calculations based on administrative data from DCPS.

Notes: Experience in DCPS is the number of years the principal led any DCPS school. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible. The table excludes principals in four schools for which FRPL eligibility data were not available.

Our conclusions about the experience and effectiveness of DCPS principals are limited for two reasons. First, principal experience is not a precise measure of effectiveness. Second, the relationship between experience and school poverty depends largely on the poverty level of the schools for which new principals were hired, and this pattern was different for the 2010–2011 and 2011–2012 school years.<sup>7</sup> The 2011–2012 hires, combined with the retention of many of the most experienced principals in high-poverty schools, tended to reduce gaps in principal experience by school poverty. It remains to be seen whether the increase in the proportion of experienced principals in high-poverty schools is a trend that will continue beyond the 2011–2012 school year.

<sup>7</sup> Principals rarely move between schools in DCPS. Thus, the locations of new hires and exits from DCPS instead of transitions between schools determine principal experience levels in a group of schools.

## ***Questions for Further Analysis***

The analysis of human capital strategies for the 2010–2011 and 2011–2012 school years raises a number of important questions about IMPACT and changes in teacher and principal effectiveness over time in DCPS. We have addressed questions identified by the auditor, but there are other questions whose answers may be relevant for education policymakers and practitioners. These questions are outside the scope of the current report, but we list them here to guide future research. Some of these questions will need to address challenges in measuring changes in teacher effectiveness over time, whereas IMPACT was primarily designed to measure effectiveness within a school year.

**Do IMPACT scores and IMPACT score components provide consistent and reliable measures of teacher effectiveness?** Do teachers who have a high score on one IMPACT component also have a high score on others? If all IMPACT components contribute to a consistent measure of teacher effectiveness, concerns about mismeasurement in any single component are reduced. Does performance measured in one school year predict the same teacher’s performance measured in a future school year? Although the effectiveness of individual teachers is expected to change from year to year, the success of retention decisions made by DCPS based on past IMPACT scores depend on these scores being predictive of future effectiveness.

**Have retention rates of effective teachers changed since the first year of IMPACT?** Also, has the overall retention rate changed since the years prior to IMPACT? Because teachers who earn an ineffective rating in one year or a minimally effective rating for two consecutive years are dismissed under IMPACT, overall retention rates may fall even as effective teachers are retained at higher rates.

**How effective are novice teachers, and how do they compare with teachers who are returning to DCPS?** How does the effectiveness of novice teachers compare to returning teachers in each school year since IMPACT, and how does the effectiveness of these same novice and returning teachers compare in subsequent years when they are more experienced? Teachers typically become more effective as they gain experience, which is why novice teachers are usually less effective than veteran teachers. The success of IMPACT in improving teacher effectiveness may depend on whether and how much novice teachers improve over time.

**Is there a gap in teacher effectiveness between high- and low-poverty schools, and has it widened or narrowed since IMPACT?** What are the trends over time in average effectiveness, the relationship between effectiveness and teacher mobility, and the relationship between effectiveness and teacher experience in low-, medium-, and high-poverty schools? Are changes in the gap were caused by changes in the identity of teachers in these schools (such as new hires, moves between schools, and teacher dismissals) and/or changes in the effectiveness of teachers who remained in a school?

**Have teachers changed grade or subject assignments in response to IMPACT?** The IVA component of IMPACT has been used to calculate IMPACT scores only for Group 1 teachers.

Because the IMPACT score is calculated differently for different IMPACT groups, teachers may respond by changing their subject or grade assignments. Changes in grade or subject assignments could be related to teacher effectiveness.

**What more can be learned about principal effectiveness in DCPS?** The analysis of principal experience raises questions about how experience is related to effectiveness, how DCPS recruits and retains effective principals, and how DCPS assigns principals to schools.

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## **Technical Appendix to Section II: Data and Analysis**

We relied on data provided by DCPS that include (1) IMPACT scores and effectiveness categories for all DCPS teachers in the 2010–2011 and 2011–2012 school years, (2) a list of teachers teaching in the 2009–2010 school year, (3) principals’ school assignments for the 2000–2001 through 2011–2012 school years, and (4) individual student background characteristics.

We calculated teacher experience and retention rates by linking teachers across years in the IMPACT data. The IMPACT data include all teachers in IMPACT Groups 1 through 7.<sup>8</sup> If a teacher was not listed in consecutive IMPACT files, we concluded that he or she was not retained for the second year. These files only include teachers; therefore, the group of teachers we classified as not retained for the second year may include some who assumed administrative roles.

We distinguished new teachers and second-year teachers from all other returning teachers by linking teachers across consecutive years in the data. New teachers in the 2011–2012 school year were those not teaching during the 2010–2011 school year. Second-year teachers were those who taught during the 2010–2011 school year but not during 2009–2010. All other returning teachers taught during both the 2009–2010 and 2010–2011 school years. Our approach reflects the best data available to us; we recognize, however, that any teachers on leave for the 2010–2011 or 2009–2010 school years were misclassified as new or second-year teachers.

We defined low-, medium-, and high-poverty schools based on the proportion of students eligible for free or reduced-price lunch (FRPL) within the school. We used student background characteristics for the 2011–2012 school year to calculate students’ poverty status. We classified schools with less than 60 percent of students with FRPL status as low-poverty schools and those with more than 80 percent of students with FRPL status as high-poverty schools. One reason for our choice of this cutoff for low-poverty schools is that highly effective teachers in these schools receive lower performance pay under IMPACT. According to these definitions, 24 percent of DCPS schools are classified as low poverty, 26 percent as medium poverty, and 50 percent as high poverty. Alternatively, 28 percent of DCPS students attend low-poverty schools, 20 percent attend medium-poverty schools, and 48 percent attend high-poverty schools.

Some DCPS schools—called community eligible schools—did not collect FRPL eligibility data for individual students in the 2011–2012 school year.<sup>9</sup> In such cases, we used the

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<sup>8</sup> One Group 2 teacher in the 2010–2011 school year received no IMPACT rating and is excluded from all analyses.

<sup>9</sup> A school is eligible to be designated community eligible if at least 40 percent of its students have an identified need for free lunch based on direct certification (that is, the students qualify based on their families’ participation in state welfare or food stamp programs). Community eligible schools provide free breakfasts and lunches to all enrolled students and forgo collecting individual student FRPL applications.

FRPL status of students from a previous year in which FRPL status was collected, typically the 2010–2011 school year. If a student’s FRPL status was unknown in the 2010–2011 year, we retained the student’s 2011–2012 status as reported in the background data, although the status from that year may not reflect the student’s actual status. Additionally, a small number of schools cannot be assigned to one of the three poverty categories because their students are not included in the background data we received from DCPS.

## Appendix to Section II: Results from the 2010–2011 School Year

In this appendix we provide the tables that were included in Section II of the Evaluation of the DC Public Education Reform Amendment Act: School Year 2010–2011. These tables are provided for reference because results from that previous report are referred to in this report for school year 2011–2012. The tables included in this appendix are identical to those from the report for school year 2010–2011.

**Table A.1. Retention of Effective Teachers in DCPS, 2010–2011 School Year**

2009–2010 IMPACT Rating	Number of Teachers	Number Retained	Proportion Retained for 2010–2011 School Year
Groups 1 Through 8 (all teachers)			
Highly effective (350 to 400 points)	543	484	89.1%
Effective (250 to 349 points)	2,471	2,057	83.2%
Minimally effective (175 to 249 points)	459	321	69.9%
Ineffective (100 to 174 points)	62	0	0.0%
All IMPACT ratings	3,535	2,862	81.0%
Group 1 (teachers with IVA scores)			
Highly effective (350 to 400 points)	37	36	97.3%
Effective (250 to 349 points)	305	259	84.9%
Minimally effective (175 to 249 points)	124	94	75.8%
Ineffective (100 to 174 points)	10	0	0.0%
All IMPACT ratings	476	389	81.7%
Groups 2 Through 8 (teachers without IVA scores)			
Highly effective (350 to 400 points)	506	448	88.5%
Effective (250 to 349 points)	2,166	1,798	83.0%
Minimally effective (175 to 249 points)	335	227	67.8%
Ineffective (100 to 174 points)	52	0	0.0%
All IMPACT ratings	3,059	2,473	80.8%

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes all 3,535 Group 1 through 8 teachers in the 2009–2010 school year. Teachers are considered to have exited DCPS if they do not receive an IMPACT score in Groups 1 through 7 in the 2010–2011 school year. IMPACT classified teachers into eight groups in the 2009–2010 school year, and seven in 2010–2011.

**Table A.2. Effectiveness of New and Returning Teachers to DCPS, 2010–2011 School Year**

2010–2011 IMPACT Rating	New Teachers		Second-Year Teachers		All Other Returning Teachers	
	Number of Teachers	Proportion of All New Teachers	Number of Teachers	Proportion of All Second- Year Teachers	Number of Teachers	Proportion of All Other Returning Teachers
Highly effective (350 to 400 points)	48	7.7%	118	12.5%	322	16.8%
Effective (250 to 349 points)	440	71.0%	640	68.0%	1,348	70.2%
Minimally effective (175 to 249 points)	115	18.5%	157	16.7%	228	11.9%
Ineffective (100 to 174 points)	17	2.7%	26	2.8%	22	1.1%
All Teachers	620	100%	941	100%	1,920	100%

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes all 3,481 Group 1 through 8 teachers in the 2010–2011 school year. New teachers in the 2010–2011 school year did not teach during the 2009–2010 school year. Second-year teachers taught during the 2009–2010 school year, but not in the previous year. All other returning teachers taught during both the 2008–2009 and 2009–2010 school years.

**Table A.3. Teacher Effectiveness by School Poverty in DCPS, 2010–2011 School Year**

	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
Percentage of Teachers with a 2010-2011 IMPACT Rating of:				
Highly effective (350 to 400 points)	28.4%	9.6%	7.2%	13.4%
Effective (250 to 349 points)	64.3%	71.9%	72.4%	70.2%
Minimally effective (175 to 249 points)	6.2%	16.3%	18.5%	14.6%
Ineffective (100 to 174 points)	1.1%	2.2%	1.8%	1.8%
Total	100.0%	100.0%	100.0%	100.0%
Average 2010–2011 IMPACT Score	320	289	287	296
Average Score by Component:				
Teaching and Learning Framework	3.2	3.0	2.9	3.0
Commitment to the School Community	3.4	3.2	3.2	3.2
Individual Value Added	2.9	2.4	2.4	2.5
School Value Added	3.0	2.4	2.4	2.6
Teacher-Assessed Student Achievement Data	3.3	2.9	3.0	3.0
Average Core Professionalism Penalty	-2.5	-4.0	-3.6	-3.5
Number of Teachers	818	1,492	1,091	3,401

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes the 3,401 Group 1 through 8 teachers in the 2010–2011 school year teaching in a school for which school poverty rates were available. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible. Average scores for IMPACT components include only teachers with a valid score on the component.

**Table A.4. Amount of Teacher Turnover and Effectiveness of Teachers by Mobility Category and School Poverty in DCPS, 2010–2011 School Year**

	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
<b>Percentage</b>				
Stayers	83.0%	83.3%	61.6%	74.9%
Movers	3.8%	7.5%	6.0%	6.0%
Leavers	13.2%	9.2%	32.4%	19.1%
Total	100.0%	100.0%	100.0%	100.0%
<b>Average 2009–2010 IMPACT Score</b>				
Stayers	327	299	294	304
Movers	296	283	289	287
Leavers	304	278	260	270
<b>Number of Teachers</b>	<b>802</b>	<b>1,312</b>	<b>1,327</b>	<b>3,441</b>

Source: Mathematica calculations based on administrative data from DCPS.

Notes: The table includes the 3,416 Group 1 through 8 teachers in the 2009–2010 school year teaching in a school for which school poverty rates were available. Teachers in the “stayers” category continue teaching at the same school, “movers” transfer to a different school within the district, and “leavers” leave teaching in the district. These categories are based on changes in teaching assignments between the 2009–2010 and 2010–2011 school years. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible.

**Table A.5. Principal Experience in DCPS, 2010–2011 School Year**

Years of Experience in DCPS	Number of Principals	Number as Proportion of All DCPS Principals
1 year	31	27.4%
2 to 3 years	42	37.2%
4 to 6 years	22	19.5%
More than 6 years	18	15.9%
All Principals	113	100%

Source: Mathematica calculations based on administrative data from DCPS.

Notes: Experience in DCPS is the number of years the principal led any DCPS school, including the 2010–2011 school year.

**Table A.6. Principal Experience by School Poverty, 2010–2011 School Year**

Years of Experience in DCPS	School Poverty Subgroup			All Schools
	Low-Poverty	Medium-Poverty	High-Poverty	
1 year	4.8%	31.8%	33.3%	27.3%
2 to 3 years	38.1%	36.4%	37.8%	37.3%
4 to 6 years	42.8%	13.6%	15.6%	20.0%
More than 6 years	14.3%	18.2%	13.3%	15.4%
Total	100.0%	100.0%	100.0%	100.0%
Number of Principals	21	44	45	110

Source: Mathematica calculations based on administrative data from DCPS.

Notes: Experience in DCPS is the number of years the principal led any DCPS school. School poverty is based on the proportion of students in the school eligible for FRPL. Low-poverty schools have less than 60 percent of students who are eligible, medium-poverty schools have between 60 and 80 percent of students who are eligible, and high-poverty schools have more than 80 percent of students who are eligible. The table excludes principals in three schools for which FRPL eligibility was not available.