Improving Student Learning By Supporting Quality Teaching:

Key Issues, Effective Strategies

Amy M. Hightower

Rachael C. Delgado

Sterling C. Lloyd

Rebecca Wittenstein

Kacy Sellers

Christopher B. Swanson

December 2011

Improving Student Learning by Supporting Quality Teaching: Key Issues, Effective Strategies

Published by:
Editorial Projects in Education, Inc.
6935 Arlington Road, Suite 100
Bethesda, MD 20814
Phone: (301) 280-3100
www.edweek.org

About this Report

In this report the Editorial Projects in Education Research Center explored issues related to teaching quality and student learning, and offers strategies, approaches, and considerations for philanthropic and other organizations. This work should be of particular interest for institutions considering investing in the areas of teaching and learning. This document is a slightly revised version of a report prepared for the Toldeo, Ohio-based Stranahan Foundation in April 2010.

Editorial Projects in Education is a nonprofit, tax-exempt organization based in Bethesda, Md. Its primary mission is to help raise the level of awareness and understanding among professionals and the public of important issues in American education. EPE covers local, state, national, and international news and issues affecting preschool through 12th grade. Editorial Projects in Education, or EPE, publishes *Education Week*, America's newspaper of record for precollegiate education; edweek.org; and the Top-School-Jobs employment resource. It also produces periodic special reports on issues ranging from technology to textbooks, as well as books of special interest to educators.

The EPE Research Center conducts annual policy surveys, collects data, and performs analyses that appear in the *Quality Counts* and *Diplomas Count* annual reports. The center also produces independent research reports, contributes data and analysis to special coverage in *Education Week* and edweek.org, and maintains the Education Counts and EdWeek Maps online data resources.

The study's co-authors are current and former members of the EPE's Research Center and Knowledge Services divisions.

We would like to extend our thanks to the Stranahan Foundation and its executive director, Pam Howell-Beach, for supporting this work. Several individuals also provided helpful guidance for this report, including: Shyrelle Eubanks, senior policy analyst for the National Education Association (NEA); Marci Young, Pre-K Now project director for the Pew Center on the States; Stephen Sawchuk, Assistant Editor, and Debra Viadero, Assistant Managing Editor, for *Education Week*; Edward Crowe, senior adviser for the Teaching Fellows Program, Woodrow Wilson National Fellowship Foundation; and Segun Eubanks, Teacher Quality Department director for the NEA.

Table of Contents

1. Overview

Few topics in education have captured as much attention from policymakers and practitioners as the connection between teaching quality and student achievement. The research has clearly shown that quality teaching matters to student learning. Teacher quality has been consistently identified as the most important school-based factor in student achievement (McCaffrey, Lockwood, Koretz, & Hamilton, 2003; Rivkin, Hanushek, & Kain, 2000; Rowan, Correnti & Miller, 2002; Wright, Horn, & Sanders, 1997), and teacher effects on student learning have been found to be cumulative and long-lasting (Kain, 1998; McCaffrey et al., 2003; Mendro, Jordan, Gomez, Anderson, & Bembry, 1998; Rivers, 1999; Sanders & Rivers, 1996).

However, researchers continue working to untangle important aspects of these relationships, including the specific ways in which quality teaching operates, the degree to which it drives learning, and how effectiveness evolves as teachers progress through their careers. In addition, the field is still seeking clarity about how to develop, measure, and sustain teacher effectiveness. This ongoing research attention is paralleled by momentum at the federal policy level, particularly efforts to strengthen accountability for teacher quality and, most recently, to define teacher effectiveness (at least in part) based on growth in student learning. The No Child Left Behind Act of 2002 (NCLB) defined a highly qualified teacher as one with at least a bachelor's degree, full state teacher certification, and demonstrated knowledge in the subjects taught. States have struggled to implement that definition and track "highly qualified" teachers within their systems in a meaningful way. As activity heightens around reauthorization of the Elementary and Secondary Education Act, the most recent iteration of which is NCLB, the Obama administration has signaled the importance of coupling federal funding with states' abilities to link student achievement data with the evaluation of teachers and school leaders and their effectiveness. Similar priorities have also been expressed through the federal stimulus, the American Recovery and Reinvestment Act, and especially its education-focused Race to the Top Program.

Against this research and political backdrop, this report summarizes the state of research on teaching quality, the links to student learning, and the contextual factors that play an intermediating role in teaching and learning. These findings are complemented by an overview of promising strategies for improving teaching quality. In the interest of providing foundations and other institutions and stakeholders with the most relevant insights for improving practice and policy, this report intentionally concentrates on the more concrete and actionable aspects of teaching quality and instruction rather than relatively subjective and intangible factors like teacher dispositions. This focus leads us to literature in both the K-12 system and the early-childhood arena that discusses teacher professional qualifications, models to improve and gauge quality instruction, and examples from the field.

To identify key topics and studies, we first consulted with six individuals: two specialists in early childhood, two *Education Week* reporters who cover teaching and research, and two general experts on teaching quality. From these leads and independent, targeted literature searches, we identified approximately 50 research studies that became the foundation of our systematic review of the field. The vast majority of these contained summaries of the research literature, and 15 were pure research syntheses. About one in five focused specifically on early childhood. We reviewed original studies and additional materials beyond the syntheses studies when the source was particularly seminal and/or the reviews suggested further study was warranted. These subsequent investigations were used to: obtain more up-to-date information; clarify vague information from a review; distinguish advocacy and unbiased research; or assemble more extensive background research resources, particularly for early-childhood issues. The bulk of our review is based on intensive interaction with a majority of these 50 sources. In order to provide further information related to key findings, we also reference within the body of this report other relevant reports and publications that were cited by the works we reviewed. All of these sources are listed in the References section of this report.

The above-referenced count of 50 formally reviewed documents excludes the sources we used to compile profiles of exemplar strategies documented in Section 3 and the philanthropic efforts described in Section 3 and Section 4. Most of these sources consisted of Web-based information about the respective programs, as documented in the Appendix or otherwise noted in the

References list. In the case of philanthropy, much of the reported information comes directly from foundations' Websites. As described more specifically in Section 4, we also analyzed several philanthropic databases to identify foundations with prominent grantmaking investments in teaching-quality initiatives to identify the major players and initiatives in the field.

Since this project examined issues of teaching quality and learning as they affect both the early-childhood period and grades K through 12, by way of definition, it is worth noting that some experts consider "early childhood" to refer to children ages 3 and 4 years old, while others assume an expanded age-range that extends through grade 3. The latter would, therefore, include part of the K-12 sector. In either case, research suggests that effective early-childhood learning requires teachers to introduce foundational knowledge such as vocabulary, phonics, and number concepts that provide scaffolding for students' readiness for later instruction. In addition, teachers in the early-childhood sphere must also create an environment conducive to social and emotional development that readies children for successful entry into elementary and secondary education. That distinction proves to be a major point of divergence in the research on early childhood and K-12, with the former more strongly emphasizing the social-developmental dimensions of teaching and learning than the latter.

In general, the early-childhood research appears to focus more broadly on program effectiveness than on quality teaching, per se, including the value added by these programs to children's future success in school and life. Numerous studies (Ackerman, 2005; Bueno, Darling-Hammond, & Gonzales 2010; Frede, Jung, Barnett, & Figueras 2009) have found that children participating in high-quality early-childhood education programs, as compared with those who did not, have:

- Higher grades and pass rates from one grade to the next;
- A greater likelihood of earning a high school diploma;
- Fewer referrals to special education programs, remedial services, or tutoring to keep pace with their elementary school classes;
- Greater ability to focus and engage in school work; and
- A lower risk of engaging in criminal activities.

Studies have found that every dollar invested in early education generates anywhere from $4 to $17 in returns (McCartney, 2009; Schweinhart, Barnes, & Weikhart, 1993).

Increasingly, early-childhood research has examined the role of the teacher in increasing the effectiveness of early-childhood programs. To date, this research has centered on the conditions and experiences teachers need to perform well, including such elements as professional communities, the role of formal higher education, and the effects of specialized training in pedagogy (Burchinal, Mashburn, Pianta, & Vandergrift, 2009). Most recently, a few studies have examined the linkages between teaching credentials and the quality of child outcomes and student learning. Those findings and strategic examples have been integrated into the applicable sections of the report along with discussions of K-12 schooling. While a full review of the federally funded Head Start program was beyond the scope of this project, key findings from a review of several prominent Head Start studies are relevant to the issues discussed throughout this report and are integrated within.

The remainder of this report is organized by the following sections:

Section 2—Definitions and Dynamics of Teaching Quality examines working definitions of teaching quality, the research base behind teacher qualifications, ways to influence and measure the human capital pool, and contextual factors that enable and constrain effective teaching and learning.

Section 3—Promising and Emerging Strategies to Improve Teaching and Learning relates research-based insights to specific programmatic strategies for increasing effective teaching and learning, identifying a variety of promising practices along each strategy line.

Section 4—The Philanthropic Landscape engages in an environmental scan of the investments made by major foundations in the area of teaching quality and includes a list of the most influential actors in this area.

Section 5—Conclusion and Recommendations raises considerations for foundations and other philanthropic organizations that may inform approaches for prioritizing their investments, in light of the research, promising strategies and practices, and other philanthropic endeavors identified in this report.

2. Definitions and Dynamics of Teaching Quality

There is no firm consensus within the field as to exactly what constitutes high-quality teaching or a quality teacher. However, it will be useful to establish a working definition of teacher quality for the purposes of the current report. The clearest and potentially most useful example identified in our review of the literature comes from the Center for High Impact Philanthropy (2010, p. 7):

> A quality teacher is one who has a positive effect on student learning and development through a combination of content mastery, command of a broad set of pedagogic skills, and communications/interpersonal skills. Quality teachers are life-long learners in their subject areas, teach with commitment, and are reflective upon their teaching practice. They transfer knowledge of their subject matter and the learning process through good communication, diagnostic skills, understanding of different learning styles and cultural influences, knowledge about child development, and the ability to marshal a broad array of techniques to meet student needs. They set high expectations and support students in achieving them. They establish an environment conducive to learning, and leverage available resources outside as well as inside the classroom.

While this definition could apply to teachers working with students of all ages, it resonates most strongly with teaching at the K-12 level. By contrast, discussions of teaching and teaching quality during the early-childhood years tend to focus more heavily on knowledge of child development. Specifically, the early-childhood literature emphasizes: the importance of knowing how to best promote children's social and emotional needs, organize the learning environment for young children, help children make connections, and encourage language skills and higher order thinking (Pianta & Hadden, 2008; Sadowski, 2006). The assumption is that quality early-childhood teachers possess these abilities, which will translate into academic and developmental success in future schooling and life.

These definitions suggest that teaching quality in practice constitutes a set of actions and activities that improve student outcomes. As is often the case, despite some areas of common ground, the field remains engaged in active debate and discussion around some key aspects of defining quality teaching and its impacts. Understandings of "quality" can be contentious. For example, in a widely cited review of research on teaching quality, Laura Goe, an expert on teacher effectiveness with the Educational Testing Service, cautions against "a one-size-fits-all definition … because a variety of occasions and purposes exist for which different definitions may be appropriate (Goe, 2007, p. 3)." She notes that "indicators of quality relevant to making initial hiring decisions may be different from the indicators used in granting tenure, rewarding excellent performance, or identifying and supporting struggling teachers (Goe, 2007, p. 2)." She speaks to the point that different definitions may be relevant in different contexts and at different points of a teacher's career.

In investigating the meaning of quality, the research literature has examined a wide range of student outcomes. Much of the recent work in the field has focused particularly on quantifiable indicators of educational performance such as student test scores. "Hard" performance measures of these kinds have the appeal of quantifying a key outcome of student learning in a relatively objective and standardized manner for large numbers of students and teachers. In fact, test scores and other quantitative measures are an essential foundation of the research programs that have generated key insights regarding the importance of quality teaching and supported consensus that teaching has the largest in-school impact on student learning and school leadership exerts the next-largest influence.

Those research traditions, however, are not without their limitations or critics. For example, historian Diane Ravitch, research professor of education at New York University, has recently cautioned that the escalating focus on student testing as a proxy for judging teachers (and students) is misleading and potentially harmful. She claims in her recently published book — *The Death and Life of the Great American School System: How Testing and Choice Are Undermining Education* — that the current political emphasis on testing "encourages too much testing, too much test prep, gaming the system, and even cheating, …all of [which] may produce higher test scores but…does not produce better…[or] even good education (Q&A with Diane Ravitch,

March 2010)." For such reasons, Ravitch and others believe that some findings from test-based research studies may be flawed and deserve further scrutiny.

A comprehensive review of the validity associated with the use of standardized tests as a measure of student learning and teacher performance is beyond the scope of this report. However, we would be remiss not to mention that these debates exist and that they are, at times, heated. Researchers have also examined a variety of "softer" (i.e., less readily quantifiable) measures that capture the behavioral, social, and developmental impacts of teaching. The latter have been an important focus of work in the early-childhood arena.

Despite those different approaches to the issue of teaching quality and a healthy level of debate within the field, an examination of the literature identifies three main approaches to defining teaching quality and the interplay between effective teaching and increased student learning:

- Research that focuses on teacher qualifications,
- Research on ways to influence the human capital pool, and
- Contextual factors that act as mediating influences.

This section of the report will explore the research in these key areas in more depth.

2.1. Defining Quality Teaching Via Teacher Qualifications

Below we examine the body of research on teacher qualifications, which includes attention to academic degrees, certification, coursework, teacher preparation programs, and teacher test scores. A common thread in the following review is a focus on teacher qualifications as they relate to student achievement. We draw heavily on several major syntheses (Goe, 2007; Rice, 2003; Wayne & Youngs, 2003; Zeichner & Conklin, 2005) to characterize major findings on the relationship between teacher qualifications and student performance, with an emphasis on standardized test scores. The connection between teacher qualifications and other measures of student performance, such as attendance or grades, is generally beyond the scope of this summary.

Academic degrees

Although the nation is witnessing a major push to promote performance-based pay for teachers, nearly all current teacher-compensation systems are built around the dual pillars of seniority and degree acquisition. These systems, for example, generally provide stipends to teachers who earn a master's degree or otherwise rely on a salary schedule that rewards teachers for earning advanced degrees or course credits. Nonetheless, evidence that such degrees contribute to student achievement is limited. Some studies indicate that a teacher's advanced degrees in mathematics and science are positively related to student achievement in those subjects in high school, but evidence does not apply more broadly to other academic subjects or grade levels (Ferguson & Ladd, 1996; Goe, 2007; Goldhaber & Brewer, 1998, 2000; Rice, 2003; Wayne & Youngs, 2003).

In a recent analysis, Roza and Miller (2009) argue that states should end the practice of providing automatic pay increases to teachers for earning a master's degree and instead reward effectiveness in the classroom. This contention is based largely on research showing no relationship, on average, between master's degrees in education and student achievement. While acknowledging that master's degrees in mathematics and science have been associated with student learning in those content areas, they point to data indicating that 90 percent of teachers' master's degrees are in education as evidence that most pay increases are awarded for degrees unrelated to performance.

Research on academic degrees in the K-12 arena focuses on graduate degrees because teachers with bachelor's degrees are the norm. In the realm of early-childhood education, research has focused on the impact of bachelor's degrees on teacher quality because, historically, a substantial portion of early-childhood instruction has been provided by staff without an undergraduate degree or formal teacher-preparation training. Early-childhood educators with a bachelor's degree are found to be more responsive to children and to provide more activities that promote language development and emergent literacy than teachers without a bachelor's degree (Ackerman, 2005; Saracho & Spodek, 2007; Whitebook, 2003). However, as of 2008, 21 states that fund prekindergarten did not require that teachers possess a minimum of a bachelor's degree (Barnett, Epstein, Friedman, Boyd, & Hustedt, 2009). Research has demonstrated that a bachelor's degree alone is insufficient to ensure teacher quality at the early-childhood level. Rather, it is the presence of that degree in combination with specialized training relating to classroom practice that results in quantifiable teacher-quality improvements (Pianta & Hamre, 2009).

Certification

Teacher certification is a formal process that has been the subject of myriad state laws and a centerpiece of federal policy related to teaching. Despite their logical importance as benchmark credentials needed for entry into the teaching profession, research provides only limited evidence that teaching certificates signify teachers can produce greater student achievement. Over the years, researchers have evaluated the impact of various types of certification. Studies have examined the effects of alternative-route, emergency, and subject-specific certification on student performance. Some research supports a relationship between subject-specific certification and student learning, but studies on alternative-route and emergency certification (as compared with traditional pathways) have been inconclusive (Rice, 2003).

Studies support a positive connection between teacher certification in mathematics and student achievement in that subject at the high school level, but have not identified such a link for other academic subjects in high school or in reading or mathematics in elementary school (Goe, 2007; Goldhaber & Brewer, 2001; Rice, 2003; Rowan, Correnti, & Miller, 2002; Wayne & Youngs, 2003).

Alternative certification policies, which allow non-traditional candidates to become licensed teachers without completing undergraduate teacher-preparation programs, have received substantial attention from policymakers for more than two decades. Research has not offered clear support for a positive or negative role for non-traditional routes to certification in student achievement (Miller, McKenna, & McKenna, 1998; Stafford & Barrow, 1994). Studies both identifying potential advantages and highlighting potential flaws of such certification pathways can be found in the literature, leaving the verdict on these options far from settled (Constantine, et al., 2009). Darling-Hammond and Haselkorn (2009) suggest that current efforts should focus more energy on applying knowledge from both alternative and traditional preparation programs than on debating the relative merits of various routes (also see Peter D. Hart Research Associates, Inc., 2010, for a similar perspective).

Coursework

Researchers have investigated the role of teacher preservice coursework as a foundation of high-quality instruction, placing a particular emphasis on the impact of the courses teachers have taken on the achievement of their students. Syntheses of the literature on this topic find that coursework in the specific academic content areas a teacher is assigned to teach can promote teacher quality and student achievement in some subjects and grade levels. Beyond that general conclusion, though, key research questions have centered on efforts to pinpoint the academic subjects where coursework makes a clear difference, to understand the influence of the grade level taught, and to examine how the effects of coursework in pedagogy differ from those of courses in an academic content area (Rice, 2003).

While a number of studies indicate that coursework contributes to teacher quality, the impact varies across academic subjects and grade levels. The most consistent cross-study finding from the research on teacher coursework is a positive connection between student achievement in mathematics and teachers' coursework in that subject. Some studies support the view that teacher coursework in science contributes to student performance on science tests, but findings have been less consistent than for mathematics. Definitive results linking coursework in subjects other than mathematics and science to student

achievement have not been produced. Just as academic subject taught plays an important role in the impact of teacher coursework, grade level taught appears to influence research results on this topic. The findings on mathematics and science coursework are strongest at the secondary level (Goe, 2007; Rice, 2003; Wayne & Youngs, 2003).

The exploration of evidence on distinctions between the effects of courses in education and the impact of content knowledge on teacher performance is a persistent theme in the literature on teacher quality. Some studies indicate that coursework in pedagogy is positively related to student achievement in mathematics and science, but researchers note some ambiguity in the literature in this area because earlier studies did not make a clear-enough distinction between teacher coursework in education that was linked to an academic subject (for example, math education) and courses in that subject. There is reason to believe that coursework in pedagogy has a stronger effect on teacher performance when the courses are combined with courses in content areas (Rice, 2003; Wayne & Youngs, 2003).

Overall, the efficacy of strategies to improve teacher quality by relying on teacher coursework as a lever may depend, at least in part, on which academic subjects and grade levels are targeted. Policymakers and philanthropic organizations seeking to pursue evidence-based strategies framed around the limited extant research base on the impact of content-area coursework, for example, may be largely confined to initiatives in high school mathematics.

Teacher preparation programs

Traditional teacher preparation programs, located within schools of education in colleges and universities, have faced withering criticism in recent years. One of the most widely cited critiques of teacher education programs, *Educating School Teachers* by Arthur Levine, a well-known expert on teacher preparation now at the Woodrow Wilson National Fellowship Foundation, expresses many of the most common concerns about these institutions. A central conclusion of that study is that graduates of teacher preparation programs are poorly prepared for teaching. Concerns include low admissions standards, fewer high-powered professors, and a disorganized teacher education curriculum. The study asserts that as education schools sought to gain respect in the world of higher education, they focused on academic research instead of classroom practice and became isolated from K-12 schools where students are taught. As a result, prospective teachers are not given the tools needed to succeed in an environment where student achievement is the fundamental goal (Levine, 2006). Although the study's assertions have been controversial and are not universally accepted, widespread concern over flaws in teacher preparation has contributed to more discussion of the need to hold teacher preparation programs accountable for the subsequent classroom performance of their graduates.

One potential strategy for improving teacher preparation programs is to increase research on the connection between these programs and student achievement with the goal of identifying specific types of training that can be linked to achievement gains (Zeichner & Conklin, 2005). Some evidence suggests that schools of education can equip their graduates to boost student achievement in mathematics by ensuring they have completed subject-specific coursework including pedagogical content (Harris & Sass, 2007; Rice, 2003). Researchers may offer additional assistance to teacher educators by intensifying efforts to study a variety of aspects of the substance of preparation programs (Zeichner & Conklin, 2005).

Studies and suggested reform measures have generally focused more attention on the structure of teacher preparation programs — examining whether they are four or five years in length, graduate or undergraduate, and alternative or traditional certification pathways — than on the content of the programs. Zeichner and Conklin (2005) summarize studies on program structure and find that few conclusions can be offered since the studies have methodological flaws and are not consistent in their findings. They suggest that additional investigation of the substance of programs is needed in order to gain a better understanding of the impact of particular training on prospective teachers. These authors point to the dim light offered by the literature on teacher preparation programs, noting that they reviewed few studies seeking to tie such programs to student achievement or providing adequate details on program features needed to get a clearer picture of which aspects of training make a difference. While noting the complexity of conducting research that will adequately capture the characteristics of teacher preparation programs that influence student achievement, they suggest that research using random assignment of students to qualified teachers from different preparation programs, more effective use of qualitative and quantitative data,

and well-designed case studies may offer better information that can be used to document the relationship between particular aspects of teacher training and student learning.

Researchers strike a similar tone in the area of early-childhood education. Pianta and Hadden (2008) stress the importance of moving beyond a reliance on early-childhood teacher credentials or other preparation program outcomes to create higher quality teachers. They argue that the substance and content of the training program play the largest role in improving results for children. As with K-12 teacher preparation programs, experts find there is insufficient research on the relationship between preparation programs for early-childhood education teachers and student performance (Lobman & Ryan, 2006; Pianta & Hadden, 2008).

Some studies indicate that the selectivity of the preparation program that K-12 teachers attended can be associated with student performance (Ehrenberg & Brewer, 1994; Rice, 2003). Results show that preparation of teachers in a more selective program contributes to greater achievement for students in elementary school and especially high school. Researchers suggest that the prestige of the institution is a proxy for the intellectual capacity of the teacher. College rankings are thought to reflect aspects of teaching ability comparable with those measured by test scores. Some evidence supports the view that teachers with more cognitive ability as demonstrated by their test scores are better able to increase student achievement (Rice, 2003; Rockoff, Jacob, Kane, & Staiger, 2008; Wayne & Youngs, 2003).

Teacher test scores

Given the long-standing discussion of the relationship between general teacher aptitude and student achievement, it is important to consider how particular measures of teachers' abilities relate to student learning. Research indicates that teachers' scores on tests of verbal skills (such as vocabulary or word tests) are related to the achievement of their students (Ehrenberg & Brewer, 1995; Hanushek, 1992; Rice, 2003; Wayne & Youngs, 2003). Ferguson and Ladd (1996) find that teachers' composite scores on the ACT (a college-admissions test covering multiple subjects) are tied to student achievement. There is also evidence that the general cognitive ability of teachers as measured by an intelligence test that does not use verbal or mathematical skills is related to student performance. In addition, research has found that *combinations* of cognitive measures may be more predictive of student achievement than any single measure alone (Rockoff, Jacob, Kane, & Staiger, 2008).

Some studies show a relationship between teacher licensure tests and student achievement. Standardized testing, most commonly the Praxis, is part of the teacher licensure process in 48 states and the District of Columbia (Editorial Projects in Education, 2010). Tests used for licensure may cover general academic skills, as well as knowledge of subject matter and teaching methods. For example, the Praxis I measures reading, writing, and mathematical skills. It is intended to help determine whether prospective teachers have the basic skills necessary for the profession. The Praxis II tests cover content-area knowledge in numerous subjects and subject-related teaching methods (Educational Testing Service, 2009).

Goldhaber (2005) finds a positive relationship between teachers' scores on certification tests, including the Praxis, and student test scores in reading and mathematics. Because he finds that certification test scores are more strongly related to student achievement than degrees earned and some other measures, he comments that there is some justification for states' use of these scores in regulating entry into the classroom, particularly as a way of attempting to ensure a fundamental standard of quality.

Other frequently cited studies also identify a relationship between licensure tests and student performance. Ferguson (1998) finds a positive link between teachers' scores on the Texas Examination of Current Administrators and Teachers (TECAT), a test measuring basic literacy skills and student achievement. Teachers earning better scores tended to be more able to produce achievement gains. Clotfelter, Ladd, and Vigdor (2006) determine that teacher licensure test scores are related to achievement in mathematics.

Insights and observations

Numerous studies on the impact of various inputs — such as teacher coursework, certification, and advanced degrees — on teacher quality have produced limited agreement. Research has not produced a general consensus on which teacher attributes are most significant for student achievement. The findings presented here indicate that a research consensus is apparent mainly in the area of high school mathematics where coursework, degree attainment, and certification of teachers in mathematics are believed to contribute to student performance in that subject (Goe, 2007; Rice, 2003). Goe (2007) cautions, however, that research on other academic subjects is limited, so it is somewhat unclear whether these qualifications have an impact in those content areas. She cites Nye, Konstantopoulos, and Hedges (2004) who suggest that teachers may affect student learning in mathematics more than reading because mathematics is more likely to be learned exclusively in school. Reading may be learned outside of school as well as in the classroom.

A number of studies have shown that variations in student achievement can be linked to differences in the effectiveness of teachers (Rivkin, Hanushek, & Kain, 2005; Rockoff, Jacob, Kane, & Staiger, 2008). In this review, we have highlighted studies where results provide some evidence of a link between particular types of formal teacher qualifications and student performance. Although these studies offer useful guidance on teacher characteristics that can potentially influence teacher effectiveness, there is substantial concern among researchers in the field that teacher credentials and qualifications fail to adequately explain differences in teacher quality. Some researchers indicate that evidence demonstrating a strong connection between teachers' qualifications and standardized test scores remains sparse and that teacher experience is arguably the sole teacher attribute consistently associated with student achievement (Rockoff, Jacob, Kane, & Staiger, 2008).

Rivkin, Hanushek, and Kain (2005) offer an important perspective on this persistent puzzle noting that differences in teacher effectiveness, though substantial, are not explained by the basic, more easily measured attributes investigated in the literature. Some observers have put forth the idea that student achievement results and classroom performance may offer more information in hiring and evaluation decisions for teachers than formal credentials (Darling-Hammond & Haselkorn, 2009; Rockoff, Jacob, Kane, & Staiger, 2008).

Some recent evidence supports the view that particular teacher characteristics do not explain teacher effectiveness on their own, but batches of variables combined together can provide more guidance. Rockoff, Jacob, Kane, & Staiger (2008) find that combined variables on teachers' cognitive and non-cognitive attributes are related to student achievement and conclude that "while there may be no single factor that can predict success in teaching, using a broad set of measures can help schools improve the quality of their teachers (p. 1)."

The variety of viewpoints suggests that much remains to be learned about the factors that shape teachers' ability to raise academic achievement. Future research may address gaps in knowledge about which teacher attributes and aspects of instruction have the greatest effect on student learning. The subsequent sections of this report offer some promising leads for further exploration.

2.2. Influencing the Human Capital Pool

Perhaps the most prominent conceptual framing that has been brought to bear on the issue of teaching quality in the past few years is that of human capital management. This term encompasses the larger set of human-resource management processes and professional-development practices within the American education system that operate to recruit, develop, deploy, retain, and evaluate quality teachers. Whereas the types of qualification issues discussed above deal largely with pre-service factors that can influence the quality of teaching, a human-capital perspective is primarily concerned with getting well-qualified teachers into the profession and enhancing their effectiveness (and that of the larger system) once they are in the classroom. This section reviews several major strands of thinking and research on human-capital management within the teaching profession: recruitment, retention, and allocation of teachers; professional development; and teacher evaluation.

Recruitment, retention, and allocation

In order to directly impact the hiring practices of schools, some reform efforts have focused on the recruitment, retention, and distribution of teachers and the salaries and incentives teachers receive. Recruiting high-quality applicants into teaching is often a priority for school districts, and compensation and incentive systems are a policy lever that schools may use in an attempt to improve recruitment efforts. However, districts are frequently hampered by the highly bureaucratic nature of their hiring systems. Further, the inequitable distribution of teachers has been highlighted by both the No Child Left Behind Act and the American Recovery and Reinvestment Act, which require states to enact plans to ensure that poor and minority students are not taught disproportionately by out-of-field, inexperienced, or unqualified teachers.

Selective recruitment To attract strong candidates into the teaching profession, states and districts have pursued a range of strategies, including passing higher standards for entry into teaching, easing transitions for people from other fields to become teachers, instituting salary incentives, and opening up alternative routes into the classroom (Wilson, 2009). In a study evaluating high-performing systems around the world, researchers at McKinsey & Co. found several ways in which schools were proactive in their recruitment efforts, including recruiting teachers from the top third of each graduating class, developing a mechanism for selecting teachers for teacher training, and testing applicants for specific characteristics such as high levels of overall literacy and numeracy, interpersonal and communication skills, a willingness to learn, and motivation to teach (McKinsey and Co., 2007). While the findings are not uniform, some evidence suggests that higher overall salaries can influence teacher quality (Ferguson, 1991; Figlio, 1997; Loeb & Page, 2000; Wilson, 2009). Non-financial incentives prove to be effective in recruiting teachers for hard-to-staff schools. Research shows that incentives such as guaranteed planning time, additional support, and reduced class sizes are more powerful than salary incentives (Hirsch, 2006, 2008).

School districts' human resources departments are often highly centralized and bureaucratic, which can thwart efforts to attract highly qualified candidates. Further, late hiring timelines may threaten teachers' satisfaction with their jobs and their intention to remain in the profession. In particular, late hiring places additional stress on urban districts that face a disadvantage when competing for qualified applicants who may also be applying to suburban districts with more timely hiring practices (Johnson, Berg, & Donaldson, 2005).

Retention Holding on to a workforce of high-quality teachers is a challenge. One-third of K-12 teachers leave the profession within their first three years on the job and almost half leave within the first five years (Ingersoll, 2003; Moir, Barlin, Gless, & Miles, 2010). Moreover, the rate at which new teachers exit the profession has been increasing steadily over the last 15 years (Caroll & Foster, 2010). To further exacerbate this situation, attrition rates are higher among: certified teachers, teachers with higher test scores, those with more experience, and teachers that serve minority and lower-achieving students (Boyd, Lankford, Loeb, & Wyckoff, 2005; Hanushek, Kain, & Rivkin, 2004; Ingersoll, 2001, 2002; Ingersoll & Kralik, 2004; Ingersoll & Smith, 2003; Johnson, 2004; Johnson, Berg, & Donaldson, 2005; Loeb, Darling-Hammond, & Luczak, 2005; Wilson, 2009).

K-12 teachers who leave the profession cite a variety of reasons, including lack of support from school leadership, lack of empowerment, feelings of isolation, and undesirable teaching assignments (Hirsch, Freitas, & Villar, 2008; Met Life Foundation Study, 2005; Moir et al., 2010; NCES, 2007). In addition, factors such as facilities, safety, and quality of leadership have a greater effect on teacher exodus than salary (Hanushek & Rivkin, 2007; Moir et al., 2010). These contextual factors are discussed in greater detail in section 2.3 below.

In the early-childhood area, turnover from year to year has been found to be four times the attrition rate for K-12 teachers. Every year, one-third of the early-education workforce leaves the profession. Several factors may contribute to high attrition, the most notable of which is that teachers at this level are often paid less than mail clerks, school bus drivers, and parking enforcement workers (Bueno, Darling-Hammond, & Gonzales, 2010).

Many states and school districts are experimenting with policies that use pay-related methods to recruit and retain highly qualified teachers, but distinguishing the effects of compensation changes from other teacher-support changes is complicated

(Coggshall, Ott, Lasagna, 2010). However, some research suggests that higher salaries are associated with lower attrition rates (Guarino, Santibanez, & Daley, 2006; Hanushek et al., 2004; Murnane, Singer, Willett, Kemple, & Olsen, 1991; Podgursky, Monroe & Watson, 2004; Wilson, 2009).

Teacher experience Improving retention is important because evidence suggests that the number of years of teaching experience may be positively related to student achievement. However, the overall level of experience in the teaching workforce is on the decline (Caroll & Foster, 2010). The effects of teacher experience on student achievement depend on the number of years of experience and the grade level taught. Research indicates that teacher experience contributes to student learning for teachers in their first few years in the classroom, but additional experience does not make a difference after that (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2006; Clotfelter et al., 2006; Ferguson, 1991; Goe 2007; Greenwald, Hedges, & Laine, 1996; Loeb & Beteille, 2008; Rice, 2003; Rivkin et al., 2005; Rockoff, 2004). Some studies suggest that the impact of experience on student achievement may continue beyond the earliest years in the classroom for teachers at the high school level (Rice, 2003).

Rivkin and colleagues (2005) write that low-income and minority students are more likely to have inexperienced teachers and to be at the receiving end of greater turnover rates for teachers. As a result, they call for policies designed to ensure these students are taught by more seasoned teachers.

Allocating talent Placing highly qualified teachers into every classroom is difficult because of the challenges of teacher recruitment and retention. Therefore, the question of allocation and prioritization of human resources becomes critical, especially for underserved and low-achieving students who arguably have a greater need for high-quality teachers. Studies have shown that children with the greatest need for high-quality instruction are the most likely to have teachers who are not certified in the subjects they are teaching, who failed certification exams, who come from the least competitive undergraduate institutions, and who performed poorly in prior academic settings (Betts, Ruben, & Danenberg, 2000; Boyd, Loeb, Wyckoff, Lankford, & Rockoff, 2008; Clotfelter et al., 2006; Hanushek, Rivkin, & Kain, 2004; Lankford, Loeb, & Wyckoff, 2002; Moir et al, 2010; Presley, White, & Gong, 2005). Researchers have also examined how the distribution of highly qualified teachers impacts student achievement. According to Hanushek (2009), if a student has a good teacher as opposed to an average teacher for four or five years in a row, the increased learning would be enough to entirely close the average gap between a typical low-income student receiving a free or reduced-price lunch and the average student who is not receiving free or reduced-price lunches. The disparity is even more pronounced when comparing good teachers with ineffective teachers.

Professional development

The set of qualifications-related issues discussed earlier, as well as certain human-capital management dynamics, are concerned with ensuring a certain level of quality for those who enter the teaching field. Professional development, on the other hand, focuses on improving the ongoing practice of teaching and learning for those already serving in the schools. A basic theory of action drives professional development activities. In order to impact student learning, professional development must first enhance teacher knowledge and skills, then create improved classroom teaching, which finally raises student achievement. Professional development can potentially serve a variety of purposes such as remediating weaknesses in the skills and knowledge of incoming teachers, keeping teachers up to date on emerging developments in the field, or addressing the needs of such specific student populations as English-language-learners or special education students. More is known about the effects of professional development on teacher practice than on its impact on student achievement (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

Characteristics of effective professional development Research suggests that professional development that effectively enhances what teachers know and how they teach tends to focus on: deepening subject-matter knowledge specifically for teaching, understanding how students learn and the specific difficulties they may encounter, providing enough time for significant learning, connecting what teachers are being asked to do with what teachers already know, actively engaging educators, and involving teams of teachers from the same school to participate together (Blank, Alas, & Smith, 2008; Cohen & Hill, 2000; Darling-Hammond, Wei, Richardson, Andree, & Orphanos, 2009; Desimone, Porter, Gater, Yoon, &

Birman, 2002; Garet, Cronen, Eaton, Kurki, Ledwig, Jones, et al., 2008; Garet, Porter, Desimone, Birman, & Yoon, 2001; Wilson, 2009). Other research indicates that high-quality professional development should promote effective curricular and instructional models and be based on valid theories of teacher learning (Ball & Cohen, 1999; Cohen, Raudenbush, & Ball, 2002; Hiebert & Grouws, 2007; Richardson & Placier, 2001; Rossi, Lipsey, & Freeman, 2004; Sprinthall, Reiman, & Thies-Sprinthall, 1996; Yoon et al., 2007).

Link between professional development and student achievement There is an emerging understanding about the ways in which professional development impacts student achievement. Although an experimental study examining the features of high-quality professional development showed increased teacher knowledge and desired classroom practice, it did not find that this knowledge translated into improved student outcomes or sustainable changes in practice over time (Garet et al., 2008; Wilson, 2009).

Systematic reviews exploring the effects of professional development on student achievement have produced some additional insights. For example, a review of professional development programs in math and science found that programs focused mainly on teacher behaviors demonstrated smaller influences on student learning than did programs concerned primarily with teachers' knowledge of the subject, the curriculum, or how students learn the subject (Kennedy, 1998; Yoon et al., 2007). In a more recent review that examined more than 1,300 studies on professional development, researchers identified just nine that met the arguably overly rigorous evidence standards of the U.S. Department of Education's What Works Clearinghouse. The resulting research showed that teachers who receive "substantial" professional development — that is, an average of 49 hours in the nine studies — can increase their students' achievement by about 21 percentile points (Yoon et al., 2007). Another study reviewed the designs of professional development programs that reported significant effects on improving student achievement in mathematics or science. Such effective programs tended to have certain features in common, including: a strong emphasis on teachers learning specific subject content as well as pedagogical content, follow-up reinforcement of learning, assistance with implementation, and support for teachers from mentors and colleagues in their schools (Blank & Alas, 2009).

Induction programs are often the focus of professional development efforts aimed specifically at meeting the needs of new teachers. These programs may include mentoring, orientation sessions, classroom observations, and the use of formative assessments (Berry, Hopkins-Thompson, & Hoke, 2002; Isenberg et al., 2009). Supporters of induction and mentoring argue that high-quality programs address teacher quality by reducing the high rates of attrition among new teachers and by building the capacity of new teachers to provide quality instruction (Moir et al., 2010). Moir and colleagues describe high-quality mentoring programs as having highly skilled mentors, dedicated time for mentoring, a focus on classroom and student data, engaged stakeholders, alignment with instruction, and a supportive school culture. However, a recent randomized controlled trial by the U.S. Department of Education's Institute of Education Sciences found that teachers in the focal induction programs reported spending more time meeting with mentors, but that the programs produced no significant impact on teacher retention, student achievement, or teaching practice (Isenberg et al., 2009).

Teacher evaluation

Teacher evaluation is often used both for the improvement of teaching and learning and for accountability purposes (Baratz-Snowden, 2009). The recent Race to the Top Fund, part of the American Recovery and Reinvestment Act, specifically includes teacher evaluation as a key element of its approach to teacher quality. To be competitive, states must require teacher evaluations to be based, at least in part, on student achievement. Currently, the field is engaged in discourse on the values and challenges of traditional methods of teacher evaluation, emerging approaches that are directly tied to student achievement, and strategies that focus on multiple measures of teacher and student performance.

Research suggests that the best school systems do not allow ineffective teachers to remain in the classroom for long (Gordon, Kane, and Staiger, 2006; Kane, Rockoff and Staiger, 2006; McKinsey and Co., 2007). National estimates from the U.S. Department of Education indicate that, on average, school districts dismiss 1.4 percent of tenured teachers and 0.7 percent of probationary teachers for poor performance each year (Chait, 2010). Schools often concentrate on improving teacher

effectiveness via induction programs, mentoring, or professional development. When these efforts fail to improve chronically ineffective teachers, it may be difficult to remove them from the classroom due to weak teacher evaluation systems, the time and cost of dismissal cases, the difficulty in winning cases, a school culture that is uncomfortable differentiating among teachers, or the difficulty of hiring replacements (Chait, 2010). Yet the impact on student achievement could be significant. Hanushek (2009) estimates that eliminating the least effective 6 to 10 percent of teachers would bring student achievement up significantly.

Traditional teacher evaluation

In most public schools, evaluation of provisional, non-tenured teachers occurs at least once a year, with tenured teachers generally evaluated less often. As reported in *Quality Counts 2010*, almost all states require teachers to be evaluated, with only seven states lacking such a provision. However, the criteria for these required evaluations vary. Thirty-five states require evaluation at least annually for non-tenured teachers, with formal training for evaluators mandated in roughly half of all states. Fifteen states require yearly evaluations for all teachers, tenured and non-tenured alike. And only 13 states require teacher evaluations to be tied to student achievement.

The most widely used form of teacher evaluation has traditionally been classroom observations that measure evident classroom processes, including specific teacher practices, interactions between teachers and students, or other holistic aspects of instruction (Goe, Bell, & Little 2008). Sometimes teachers and administrators conduct pre- and post-observation conferences, and teachers are often required to "sign off" on their evaluations (Brandt, Mathers, Oliva, Brown-Sims, & Hess, 2007; Donaldson, 2009; Donaldson & Peske, 2010). The majority of summative ratings on teacher evaluations are "satisfactory" or above (Donaldson & Peske, 2010; The New Teacher Project, 2007, 2009) and teachers often find little value in the evaluation process (Baratz-Snowden, 2009; Duffett, Farkas, Rotherham, & Silva, 2008).

Some of the problems associated with these traditional evaluations include: poor evaluation instruments, little school district guidance on the substance of teacher evaluations, the lack of time for evaluators to conduct evaluations, the absence of high-quality feedback to teachers in the evaluation process, and few consequences (either positive or negative) attached to the evaluations (Donaldson, 2009; Donaldson & Peske, 2010). Further, because few teachers are identified as unsatisfactory or ineffective, it has been suggested that such evaluations are perfunctory in nature (Baratz-Snowden, 2009). Some researchers say that teacher evaluations often result in little instructional improvement and the continued employment of weak teachers (Donaldson & Peske, 2010; The New Teacher Project, 2009).

Tying teacher evaluation to student achievement

Partially in response to the identified weaknesses of traditional measures of teacher evaluation, there has been growing interest in linking evaluations of teacher effectiveness directly to student learning, with "value-added" models among the most prominent examples of this trend. While the current discussion focuses on the use of value-added models for teacher evaluation, that type of analysis can also be applied to investigate any number of issues, including the effectiveness of particular interventions or programs, trajectories of individual student learning, and patterns of school improvement.

Value-added approaches seek to quantify the contribution of specific teachers, schools, or programs to student test performance while taking into account the differences in prior achievement and perhaps other measured characteristics that students bring with them to school (National Research Council and National Academy of Education, 2010). The promise of value-added models rests in their ability to directly link individual teachers to the performance of their own students. Compared with other methods, value-added analysis may come considerably closer to isolating the amount of growth in student learning attributable to a particular teacher. Accordingly, proponents of value-added approaches argue that because such methods are more objective and able to account for such non-school factors as poverty or family background, they represent a more appropriate basis for evaluating teacher performance.

However, significant questions remain as to how or whether value-added measures should be used for formal teacher evaluation. While recognizing potential value in using such methods for low-stakes purposes, researchers are typically more cautious about their application for high-stakes decisions, such as teacher dismissal (National Research Council and National Academy of Education, 2010). The practical challenges include the danger of using test scores as the sole measure of student

performance, the lack of data for all teachers in all subjects, the need to consider the possible unintended consequences that might result from widespread use of value-added measures, the question of how to attribute improved student performance when multiple teachers are involved, and data quality issues. Critics also point out that value-added measures fail to identify specific teacher practices that lead to improved student achievement (National Research Council and National Academy of Education, 2010). Additionally, researchers have raised methodological questions about the instability of value-added measures over time whereby teacher effects fluctuate substantially from one year to the next, as well as potential biases that may be inherent to the models themselves (Ladd, 2008).

Multiple and alternative teacher evaluation criteria A variety of efforts are underway to broaden the scope of teacher evaluation to include multiple measures of performance, so that determinations of teacher effectiveness are not based narrowly on a single test score (Goe et al., 2008). In addition to tested achievement, teacher evaluation criteria might include classroom artifacts such as lesson plans or student work, documents on a range of teacher behaviors, or somewhat less tangible factors like teacher beliefs and expectations. These criteria can be measured using such tools as standardized classroom observation tools, protocols for the analysis of classroom artifacts, student ratings of teachers, self-reports from teachers, peer reviews, or teacher portfolios. Among these techniques, researchers are paying increasing attention to standardized classroom observation tools. Through the Classroom Assessment Scoring System (CLASS), the early-childhood community is able to employ several measures to assess teacher quality. CLASS examines three domains in which teachers interact with children: emotional supports, classroom organization, and instructional supports. Evaluating teachers on all aspects of their interactions gives a stronger picture of the contributions teachers make to the child's educational experiences (Pianta & Hamre, 2008). Recent state efforts to improve early-childhood teachers' effectiveness and classroom experiences for children also include Quality Rating Systems, which are mechanisms for defining the optimal conditions for caring for and preparing children for school, and for encouraging and rewarding improvement to higher levels. (Bryant, et al., 2008).

Insights and observations

Human capital approaches to improving teacher quality are a prominent feature of the education landscape and have focused largely on improving the recruitment, retention, and allocation of teachers, professional development, and teacher evaluation. Knowledge is still emerging as to whether and how these practices may be effective. While many school districts are characterized by highly centralized and bureaucratic human resource systems, the research described here indicates that high-performing systems use a specific set of proactive recruitment strategies. Also, both financial and non-financial incentives can be effective in recruiting teachers. The problem of retaining high-quality teachers is a serious one, given research suggesting that teaching experience is positively related to student achievement. Lack of support from school leadership, lack of empowerment, feelings of isolation, undesirable teaching assignments, facilities, and safety are among the variety of school climate factors that impact teachers' decisions to leave the profession. We return to these in-school factors in Section 2.3.

There is general consensus about the characteristics of effective professional development that enhance what teachers know and how they teach. High-quality professional development deepens subject-matter knowledge, provides enough time for teacher learning, connects existing knowledge with new knowledge, actively engages teachers, and involves teams of educators learning together. Research continues to explore the link between professional development and student achievement. Among the most promising research-based efforts to improve the quality of professional development may be: conducting full evaluations of professional development programs, identifying factors required to scale up programs and strategies, and creating access to follow-up data on teacher knowledge, instruction, and student learning.

Finally, teacher evaluations are currently undergoing a shift from traditional classroom observations that overwhelmingly rate teachers as "satisfactory" while providing little actionable feedback for educators toward approaches that link teacher practice to student achievement. Further, there is an emphasis in the field on the need to use multiple measures, not just standardized test scores, to inform teacher evaluations.

2.3. Contexts that Influence Effective Teaching and Learning

A wide array of cross-disciplinary research has explored the ways in which context, broadly understood, influences the effectiveness of teaching and learning, including connections between context and the impacts of reform and policy initiatives. This work has encompassed topics as varied as "sensemaking" or how teachers and students interpret and perceive reforms, family and societal influences, and working conditions.

The Center for the Context of Teaching, a research center based at Stanford University's School of Education, has been devoted to this line of work since 1987. Center directors Milbrey McLaughlin and Joan Talbert categorize teaching contexts in two ways: school context and broader social influences. School contexts include sector (i.e., public or private) and system conditions (e.g., policy), internal school organization, and class-level and student identities. The broader set of social and institutional contexts includes routines dictated by higher education, social class and peer cultures, and subject-matter cultures. Their research focuses on understanding the interactive, embedded nature of contextual effects on teachers (and students) and the practice of teaching. Putting it succinctly, they note that: "Teaching does not take place in generic classrooms stripped of subject-matter concerns or mindless of the backgrounds, needs, and interests of the students who make up a class … or contexts specific to their schools and classrooms (McLaughlin & Talbert, 1993, p. 193)."

Scale and replicability

Research such as McLaughlin and Talbert's touches on issues of scale and replicablility, which are at the heart of best practices and knowledge about the factors that may lead a reform to work well in one environment and less effectively in another.

Cynthia Coburn at the University of California at Berkeley wrote a comprehensive analysis of how researchers have defined "going to scale", noting in a 2003 paper that scaling up involves both the spread of reform to multiple individuals and locations, as well as challenges of reform implementation and sustaining change across embedded contexts and shifting priorities. Coburn argues that going to scale involves depth, sustainability, spread, shifting ownership, and each of these interrelated factors affects how and whether a program or policy is fully implemented.

Harvard University's Richard Elmore (1996) suggests that scale-up is influenced by four conditions:

1. Developing strong external normative structures for practice;
2. Developing organizational structures that intensify and focus, rather than dissipate and scatter, intrinsic motivation to engage in challenging practice;
3. Creating intentional processes for reproduction of successes; and
4. Creating structures that promote learning of new practices and incentive systems that support them.

The key lesson from this line of research is that reforms, programs, and policies cannot be transplanted from one site to another without an inevitable (and necessary) process of mutual adaptation during which the reform itself will be transformed to merge with (or be rejected by) local factors that are highly contextualized. This is important to keep in mind when considering the strategies and examples profiled in Section 3 of this report.

The context of working conditions

Another important line of research around contextual influences that enable and constrain instruction includes that of Harvard's Susan Moore Johnson, whose work focuses on the interactions between contexts of working conditions and other factors. She and her colleagues have found that job satisfaction, teacher morale, and school environments are at least as important as teacher pay in determining teacher retention. For example, Johnson and Birkeland (2003) studied a group of

new teachers over a four-year period and found that, while they were generally dissatisfied with low pay, only one of the 17 who left the profession cited doing so mostly because of pay. Teachers who transferred to other schools said they sought better working conditions, "such as more orderly schools, better facilities and supplies, better professional development, or smaller classes (p. 45)." Other research supports these findings. For example, Luekens, Lyter, Fox, and Chandler (2004) found that teachers who left the profession or transferred to other schools cited dissatisfaction with workplace conditions as a larger influence than pay.

Richard Ingersoll's work at the University of Pennsylvania has also explored the nature of school workplaces and the interaction between working conditions and teaching and learning. He has found that teachers consistently identify the following workplace conditions as central to their decision to stay in the profession, transfer to other schools, or leave teaching altogether (see Ingersoll, 2001, 2003):

- Supportive school leadership;
- Engaged community and parents;
- A safe environment and sufficient facilities (see also Johnson et al., 2005);
- High-quality professional development and enough time to plan and collaborate;
- An atmosphere of trust and respect (see also Bryk & Schneider, 2002);
- Effective school improvement teams; and
- Appropriate assignments and workload (see also Johnson et al., 2005)

Most, if not all, of these elements concern working conditions specific to teaching and learning, and research has consistently demonstrated a positive link between favorable working conditions and teacher retention. But research linking such factors more directly to student learning is less conclusive. Johnson et al., (2005) speak to the complexities of making this link, arguing that the effects of school resources and conditions of learning:

> …are largely indirect and often interact with other parts of the teachers' and students' experiences. At the most basic level, the adequacy and maintenance of school buildings affect the health and safety of the adults and children who work there. A school in serious disrepair presents an array of hazards for everyone in it. The physical elements of schooling also influence instruction — both what can be taught and how it can be taught. A school's lack of textbooks, a library, science equipment, or reliable photocopy machines inevitably limits the kind of teaching and learning that can occur. Teachers may do their best to cope with such deficits, but ultimately their students' opportunity to learn in poorly maintained and ill-equipped schools falls short of what it might be in schools that are sound, well equipped, and generously supplied (p. 50).

Nonetheless, several attempts have been made to isolate the effects of working conditions on student learning. For example, a study of teachers in Clark County, Nev., by Hirsch and Emerick (2006) found a correlation between teaching and learning conditions and student achievement, particularly in the area of elementary mathematics performance. Specifically, the authors found a statistically significant correlation between facilities/resources and both rates of student proficiency in math, reading and writing, and whether schools made Adequate Yearly Progress under the federal No Child Left Behind Act.

The context of leadership conditions

Likewise, several studies have found leadership to be a key school contextual variable that is directly linked to student learning. Leithwood, Louis, Anderson, and Wahlstrom (2004) have written a comprehensive analysis of the effects of school leadership on student achievement, providing an explanation of the body of research that sought to isolate leadership effects. Indeed, that body of work has suggested that leadership contributes more to in-school learning effects than any factor other than teaching (see Hallinger & Heck, 1998). In addition, leadership effects tend to be strongest in schools that are struggling (as discussed in Portin, et al., 2009 and Leithwood, et al., 2004).

Collectively, research suggests that "successful school leaders articulate a vision for shared organizational purpose and shared authority and that the ability of principals to envision new ways to do this is critical to the work of teacher leaders (Portin, et al., 2009, p. 89)." Principals can play key roles in establishing collaborative workplace routines, implementing school initiatives, determining teaching assignments, assigning students to teachers, setting expectations for ongoing professional development, defining instructional goals, and serving as intermediaries between policy and practice (Johnson et al., 2005). Traditionally, research has examined leadership in terms of formal roles and positions, most notably the role of school principal. More recent attempts have broadened this perspective to examine notions of distributed leadership with respect to both formal and informal roles, including peer coach, mentor, department chair, and master teacher (Spillane, Halverson, & Diamond, 2001).

Insights and observations

The next portion of this report profiles a variety of programs and strategies that are promising attempts to positively influence teaching and learning. It will be important to keep in mind that these program examples reviewed exist within particular contexts and conditions. Their replicability or potential for scale-up hinges on contextual variables that enable and constrain effective implementation. More specifically, the research reviewed above suggests that working conditions and leadership are likely to be among the most relevant contextual forces in operation at the school level.

3. Promising and Emerging Strategies

The previous section of this report synthesized research across three key areas: teacher qualifications, human capital, and context. Collectively, this knowledge contributes to an understanding about the nature of effective teaching and the connection between teacher effectiveness and student learning. Building on this knowledge base, we will introduce six specific strategies that have emerged in efforts to promote and support more effective teaching.

As above, this section of the report will be organized around the three focal areas of qualifications, human capital, and context. For each, we will:

- Introduce prominent strategies that have emerged in the field;
- Describe the primary philanthropic investments underway; and
- Highlight more specific programs and practices that exemplify each of the broader strategies.

By way of introducing each of these six major strategies or improvement strands examined below, we summarize the ways in which foundations have been most active. We then couple each strategy with several examples from both the K-12 and early-childhood sectors that exemplify each approach. Although the early-childhood sector is represented, a greater number of examples focus more specifically on teaching quality in the context of K-12 education. This may be due, in part, to a more recent emergence of teaching quality issues within the early-childhood field. Examples specific to K-12 represent a larger proportion of the programs and practices described below. However, some of the insights gleaned from work at the elementary and secondary levels may also be applicable to early childhood. The report's Appendix provides additional details about the featured programs, including where to find further information on the Web.

3.1. Strategies Focusing on Teacher Preparation

Initiatives to improve levels of teacher qualifications have largely revolved around issues related to teacher preparation. Specifically, initiatives tend to focus on ensuring that emerging teachers have access to high-quality teacher preparation experiences, which research suggests should include a firm grounding in academic subject-matter content, the development of pedagogical knowledge, and a substantial amount of structured, supervised time in the classroom. There are promising initiatives in both traditional teacher preparation and alternative models.

A number of foundations have been active in making teacher training a centerpiece of their investments in education. For example, the **Carnegie Corporation of New York** provides grants aimed at improving teacher preparation through better data on the effectiveness of teacher-training programs and the identification of strong programs as determined by student achievement. According to its 2008 annual report, the foundation's grants in this area range considerably in both size and focus. More modest investments include $50,000 to California State University to support research on the connection between preservice teacher preparation and gains in student performance, as well as $170,000 to the University of Montana Foundation for work on an evidence-based teacher-training program. The foundation has also made larger investments ($2 million apiece) to Teach for America and to the New Teacher Project in support of their non-traditional teaching-training programs. As another example, in 2009, the **Ford Foundation** provided a grant of just over $41,000 to the Brandeis University Consortium for Excellence in Teacher Education to develop new strategies for preparing teachers in urban schools through a partnership with the Boston and Philadelphia Teacher Residency Programs.

Example: Alverno College

A small women's liberal arts college in Milwaukee, Wisc., **Alverno College** is one of the few exemplary four-year teacher-preparation programs praised by Arthur Levine in his 2006 review of education schools. Certain aspects of Alverno's program make it noteworthy among traditional teacher-preparation institutions. Aspiring teachers are not admitted to the teacher-education division automatically upon enrolling in the college. Rather, candidates must pass both a Praxis I and Pre-Professional Skills Test before beginning the teaching program. They must take education courses, but are also required to take coursework in other departments in the content area of the subject they intend to teach. Students have full access to professors in the education school and discipline-based departments, and faculty work together to ensure that teacher candidates possess strong content and pedagogical knowledge.

Candidates must demonstrate competencies in the following eight areas: communication, analysis, problem solving, use of ethics and values in decision making, social interaction, effective citizenship, developing a global perspective, and integrating arts into the curriculum. Each area has six developmental levels, with level four representing mastery, and candidates must demonstrate mastery of the concepts in all eight areas. Coursework for the program is organized around these eight areas, with each course syllabus describing what students have to do to show they have attained a specific level of competence.

In addition to these competency units, Alverno teaching students complete over 100 hours of engaged field experience in four separate placements over the course of their education. These experiences are designed to be progressive, with each placement allow teaching candidates to operate in an increasingly independent capacity. By the time students reach their student-teaching placement at the end of the program and enter the workforce they will have been in the classroom for more than two years (Levine, 2006). Five years after graduation, 85 percent of teaching alumni are still teaching in Milwaukee schools with principals repeatedly rating these teachers as "consistently better prepared to teach in [inner city schools] than graduates of other programs (Levine, 2006)." The fact that Alverno can cite such statistics is unique, as many programs do not track graduates for an extended period after completing their programs.

Example: The Urban Residency Program Model

Urban Residency Programs have been instituted in several cities across the United States to attract and retain a diverse cohort of college graduates, career changers, and community members who wish to enter the teaching profession in high-need, urban classrooms. These residencies combine a one-year, classroom-based practicum with a carefully aligned sequence of master's-level coursework. For the duration of the school year, residents are paired with experienced teachers, who serve as expert mentors and role models for success in the urban classroom. As the centerpiece of the residency model, these mentors receive ongoing support from the program to ensure the provision of time, resources, and coaching skills necessary to lead an effective classroom practice. Residents receive a stipend for living expenses throughout their training year, and reimbursement for the costs of a master's degree upon completion of the program.

Studies have found high retention rates among graduates of such programs. For example, 90 percent of graduates from a Boston residency program are still teaching after three years, a high percentage given national statistics suggesting that one-third of teachers leave the profession within three years. In addition, research has shown that urban residency programs have successfully attracted a diverse group of residents. Racial and ethnic minorities comprised the majority of the 2007-08 cohorts for residency programs in both Chicago and Boston. High retention among residency-trained teachers has been found to offer districts substantial savings in the areas of recruiting and training new teachers. As recently as the fall of 2009, the U.S. Department of Education recognized the promise and value of these residency programs, providing $43 million in grants to 28 teacher-preparation programs, 19 of which contain residency model elements (Berry, Montgomery, & Snyder, 2008; Connors, 2006).

Example: Teacher U

In 2008, three charter school organizations — Uncommon Schools, Knowledge Is Power Program (KIPP), and Achievement First — partnered with Hunter College School of Education to create **Teacher U**, an alternative, two-year, new-teacher

training program. Teacher U is guided by the philosophy that teacher preparation should be directly grounded in classroom instruction, based on clinical training, integrated with video observation, and focused on developing specialized teaching skills. Participants are new to the classroom; they are uncertified (although they receive a transitional certificate upon beginning the program) and have little or no prior training. Yet, participants become full-time teachers of record in one of the program's sponsoring schools. Eligible applicants must have an undergraduate grade point average of 3.0 or higher.

The training program lasts two years, with participants meeting once a month during the school year and for five weeks over two summers. Instruction is differentiated by subject matter and grade level, and includes coursework covering classroom culture and general pedagogy. Faculty members are Hunter College professors and founding partner organization principals and instructors. Participants practice skills such as lesson design with master-teachers who have a record of strong student achievement. Activities include video analysis of classroom instruction and modeling of instructional techniques for candidates to practice in their own classrooms. The first cohort of candidates enrolled in 2008 with 100 students; 300 students enrolled in 2009. Graduates receive a master's degree, as well as state certification. While it is too early to fully gauge the results of the program, graduates are required to demonstrate learning gains among their students in order to earn their degrees.

Example: The Abbot Preschool Program

New Jersey is the first state in the nation to implement a court-mandated public preschool program. In the 1998 *Abbott* v. *Burke* decision, the New Jersey Supreme Court ruled that the state is required to offer all three- and four-year-old children in New Jersey's lowest-income school systems (now known as the Abbott districts) a "well-planned, high-quality" preschool program, as a part of its obligation to provide every child with a "thorough and efficient" education under the state constitution. Approximately one-quarter of New Jersey's schoolchildren reside in one of the state's 31 Abbott districts and are eligible for the **Abbott Preschool Program**.

Under the court mandate, one step to ensure access to a high-quality preschool program is the requirement that all teachers in the Abbott Preschool Program must obtain at least a bachelor's degree with a prekindergarten to grade 3 certification. The state enacted a scholarship program in order to bring the entire preschool workforce up to compliance by the deadline of 2004, at which time all teachers in Abbott districts were certified or enrolled in the appropriate programs at state institutions of higher education. Research from a longitudinal study of students has demonstrated that children who attended the Abbott prekindergarten programs continue to outperform their peers in reading and math through early elementary school and were less likely than their peers to be retained or require remediation (Frede, Jung, Barnett, & Figueras, 2009; Lobman and Ryan, 2006).

3.2. Strategies to Influence the Human Capital Pool

Efforts that in various ways attempt to enhance the store of human capital in the teaching profession have proliferated rapidly in recent years. We focus on three especially prominent strands of innovation: encouraging and directing talent, identifying effective (and ineffective) teachers and teaching practices, and providing access to professional development opportunities.

Encouraging and directing talent

A variety of strategies have emerged to recruit promising candidates into the teaching profession, keep high quality teachers in the classroom, and place effective educators in the schools where they are most needed. Philanthropic initiatives to improve the human capital pool in education include efforts to increase the supply of qualified teachers and to provide effective instructors with better compensation. Some initiatives seeking to increase the supply of certified teachers have combined efforts to improve teacher-preparation programs with the targeted placement of graduates in high-poverty or urban and rural schools. For example, in 2009, the **W.K. Kellogg Foundation** provided a $16.7 million grant to the **Woodrow Wilson National Fellowship Foundation** for a statewide teaching fellowship initiative in Michigan. It will offer prospective teachers a $30,000 stipend to finish a master's degree program and subsequently teach in hard-to-staff secondary schools. With the

goal of increasing the supply of science, technology, engineering, and mathematics (STEM) teachers, the program will target both college students and math/science professionals seeking to transition into teaching.

Similarly, the **Michael and Susan Dell Foundation** provided $3.75 million to the National Math and Science Initiative (NMSI) for its UTeach project in 2009. UTeach was established at the University of Texas at Austin in 1997 as a partnership between the university and the Austin Independent School District, with the goal of increasing the supply of STEM teachers, especially at the secondary level. The program is designed to provide a streamlined pathway to teacher certification for undergraduate mathematics and science majors. It is intended to improve recruitment and retention of teachers in those subjects by allowing students to move through training rapidly and by paying for initial training classes with university funds. The UTeach program expanded to nine states in 2008-09 and further replication efforts were announced in early 2010.

The **Ford Foundation** is another major funder that has made significant investments in teacher recruitment and retention. In 2009, it awarded $300,000 to Brown University for the Annenberg Institute for School Reform's work on school district models seeking to successfully recruit and retain teachers in urban areas.

Example: Non-traditional compensation—Houston's ASPIRE and Denver's ProComp models

Tying student achievement to teacher pay has received substantial attention in the past few years as a promising strategy for rewarding and retaining talented educators. Houston and Denver are among a handful of school districts testing out rigorous teacher evaluation systems to determine performance-based bonuses and pay. **Houston's ASPIRE model** (Accelerating Student Progress Increasing Results and Expectations) consists of both individual teacher and school-wide bonuses determined by a value-added measure based on student test scores. Classroom teachers, school administrators, and other school staff are eligible recipients. Houston teachers receive these bonuses on top of their traditional salary base, whereas in Denver teachers forego automatic salary increments in return for multiple ways to earn additional money. The **Denver Professional Compensation System for Teachers (ProComp) model** was put into place permanently in 2008 after a rigorous pilot program achieved results in attracting talented teachers, as well as in motivating and retaining experienced teachers. In Denver, teachers receive bonuses for improving their own knowledge, receiving a satisfactory evaluation, increasing student achievement, and for teaching in hard-to-staff schools and positions. Both programs have received support from the Broad Foundation.

Example: The TEACH Early Childhood Project

In 1990, the national non-profit Child Care Services Association created the **Teacher Education and Compensation Helps (TEACH) Early Childhood Project** to promote higher levels of postsecondary degree attainment, address poor compensation, and reduce high turnover within the early-childhood workforce. The TEACH Early Childhood Project provides scholarships to educators to complete coursework in early-childhood education and to increase their overall level of compensation. All TEACH Early Childhood scholarships link continuing education with increased pay and require that recipients and their sponsoring child-care programs share in the costs. Today, TEACH programs operate in 21 states.

In the 2008-09 school year, after just one year of participation, the retention rate among new TEACH participants in North Carolina was 95 percent, more than 30 percent higher than the national average. Teachers in North Carolina and two other states may choose to participate in TEACH, as well as the early-childhood salary supplement initiative, Child Care WAGE$. In the WAGE$ initiative, teachers are granted financial support from the program in concert with the pre-kindergarten program in which they teach to seek certification, an associate's degree, or a bachelor's degree in early-childhood education (Bueno, et al., 2010; T.E.A.C.H. Early Childhood Project, 2009).

Identifying and better understanding effective teachers and teaching practices

Strategies of this type seek to deepen understanding about the nature of effective teaching, including how to identify and measure it. The primary philanthropic push in this area has been from the **Bill and Melinda Gates Foundation**, which, in late 2009, launched a major initiative aimed at identifying multiple measures of teacher effectiveness. With $45 million in

support, the **Measures of Effective Teaching** project will work to increase knowledge about the factors that shape quality teaching. The research effort will include 3,700 participating teachers and will collect data using such tools as videotapes of classroom teaching and surveys of students and teachers. By funding this initiative, the foundation aims to help researchers investigate a variety of measures of effectiveness that go beyond student performance on standardized tests and identify other methods of understanding teachers' influence on achievement. As of November 2009, six school districts had been named as research sites for the project.

In a separate initiative, the Gates Foundation is supporting the **Understanding Teacher Quality project**, with the goal of learning more about the characteristics of teachers who successfully improve student achievement. Researchers are working to develop measures of teacher effectiveness that shed light on why some teachers are particularly able to boost student learning. Through the study, investigators plan to explore new measures of teacher quality using analyses of data from observations of teachers in the classroom, assignments given to students, indicators of teacher knowledge of instructional methods and subject matter, and student performance on standardized tests. By understanding more about successful instruction and quality assignments for students, the research is intended to aid in the creation of new methods of teacher evaluation. Data will be gathered in 225 English/language arts and 225 mathematics classrooms at the middle school level utilizing well-known measures such as the Classroom Assessment Scoring System for Secondary Schools from the University of Virginia and the Framework for Teaching from Charlotte Danielson.

Example: The Teacher Advancement Program

In the late 1990s, the Milken Family Foundation developed the **Teacher Advancement Program (TAP)** to improve teacher quality and professionalism. Currently, the program is being implemented on a school-wide basis and has a presence in more than 200 schools that predominantly serve low-income and minority students and reaches more than 7,500 teachers and 85,000 students. The TAP model consists of four key elements: (1) multiple career paths, (2) ongoing applied professional growth, (3) instructionally focused accountability, and (4) performance-based compensation.

In TAP, teachers are evaluated on meeting a set of expectations called "Teaching Skills, Knowledge and Responsibilities Performance Standards," which are based on 26 indicators that measure effective classroom instruction in four main areas: planning instruction, learning environment, responsibilities, and implementing instruction. Teachers are evaluated on each of these indicators by National Institute for Excellence-certified evaluators four to six times per year and are routinely observed by assistant principals, principals, and master teachers to determine how teachers can improve their instructional practices. Teachers are measured against the academic performance of their students, as well as that of all students in their school. Participating teachers also receive year-round guidance and support from expert teachers who have demonstrated excellent curricular knowledge, superior instructional skill, and good teamwork abilities through weekly cluster group meetings.

Little is known about this program's effectiveness in raising student achievement. A recent evaluation conducted by Mathematica concluded that academic performance did not improve among students in the Chicago Public Schools following a year's worth of participation in TAP.

Example: Maine's Quality for ME program

Maine's Department of Health and Human Services (DHHS) sought to develop a research-based rating system to identify and support quality early-childcare programs within the state. The DHHS Early Childhood Division held a series of focus groups to find out how parents and teachers define quality in early-education settings and then compared those results with national research on the indicators of quality. The result of that work is the **Quality for ME** rating system. In place since 2004, this four-step program is designed to increase awareness of the basic standards of early education, recognize and support teachers who provide educational experiences above and beyond those standards, educate the community about the benefits of higher quality early-childhood education, and offer incentives for providers to reach higher levels of quality. The system is used to identify teachers and programs based on established criteria and to direct additional resources and support to those most in need. Indicators of quality include such factors as teacher-child interactions, opportunities for literacy and language development, and developmentally appropriate written curriculum. Studies of these programs reveal that the Quality Rating

System is widely understood by childcare providers and that when providers reach higher levels, they are increasing the quality of care and education they provide for children, as assessed by objective and valid quality measures (Bryant et al., 2008; Elicker, Langill, Ruprecht, & Kwon, 2007).

Providing access to effective, sustained, connected professional development opportunities

The research literature supports the view that professional development done right — that is, content-specific training involving teacher teams, sustained efforts, and reinforced support with mentors and coaches — can lead to increased teacher knowledge and desired classroom practice. Strategies that seek to connect teachers to such professional learning opportunities have been initiated by several philanthropies. For example, in 2009, the **JP Morgan Chase Foundation** awarded the National Board for Professional Teaching Standards a $1 million grant to provide scholarships to teachers seeking National Board Certification. The National Board Certification is an advanced credential offered to K-12 teachers who demonstrate knowledge of teaching methods and subject-matter through 10 assessments, including portfolios. Scholarships are offered to teachers who work in low-performing schools on a nationwide basis, and priority is given to teachers who seek certification along with two other teachers from their school.

In a similar vein, the **Silicon Valley Community Foundation** recently awarded close to $1.1 million to 16 schools that serve minority and low-income students to reduce disparities in math achievement. Their strategy to reduce this gap involves two approaches for improving math instruction in participating schools: professional development and professional learning communities. Through a professional development strand, teachers learn how to use data to determine the math level at which a student begins the school year and monitor a student's progress in mastering specific math content throughout the academic year. They also learn how to tailor instruction based on the different learning styles, abilities, and interests of their students while making assignments more academically challenging. Professional learning communities provide an environment that facilitates collaboration among teachers to plan lessons, discuss how to teach particular mathematical concepts, solve problems in the classroom, and review what research has to say about ways to improve instruction. The Silicon Valley Community Foundation also aims to create a learning environment where grantees can share best practices and learn from other schools who are participating in similar efforts.

Example: The New Teacher Center Mentor Academies

The Santa Cruz, Calif.-based New Teacher Center (NTC) sponsors a professional development program focused on building the capacity of new-teacher mentors. In its **Mentor Academies**, NTC brings mentors together four times a year to share best practices around developing relationships with new teachers, collecting and analyzing classroom and student data to inform practice, and assessing and supporting teacher growth and effectiveness. The academy is based on a two- to three-year curriculum where mentors reflect, practice, and build on earlier professional development sessions. NTC also provides weekly forums for mentors to digest what they have learned at the academy, share best practices with colleagues, practice using tools and protocols that drive teacher practice forward, and identify ways of overcoming obstacles in their work. The goal of these discussions is to facilitate similar conversations among colleagues in schools and within district administration. The program also links each mentor with a peer coach as part of a structured mentor evaluation process. These assessments are intended to mirror the type of evaluation mentors will be using as a way to learn and practice the behaviors they are trying to foster in new teachers.

The NTC has seen its model put into action in cities such as Durham, N.C., Chicago, and Boston, where the outcomes point to improvements in both teacher retention and student achievement. In the Durham public schools, teacher turnover dropped from an average of 28 percent between 2000 to 2005 to 14 percent by 2007-2008. The district's new teachers also demonstrated student achievement gains as great as, or significantly greater than, veteran teachers. After its first year of implementation, retention rates in the Boston Public Schools increased from 71 percent to 80 percent.

Example: MyTeachingPartner

MyTeachingPartner (MTP) is a professional development program for teachers of young children designed and maintained by faculty and staff of the University of Virginia's Curry School of Education. This program consists of online videos of teaching strategies, classroom activities, and interactive consultancies. One set of videos includes examples of common teaching challenges that early-childhood providers often face, illustrating effective responses for addressing learning needs. The second set of videos is a collection of demonstrations of activities catalogued by types of learning, particular books, times of year, or other thematic elements. These feature specific activities coupled with research rationales for each content area, and tips for integrating the activities into pre-K curricula. The videos, paired with activity descriptions, afford participating teachers the opportunity to witness curriculum delivery in context and to learn by watching high-quality teachers interact with these materials. A third component of this program is an interactive consultancy in which teachers videotape their own practices, send the tapes to an MTP consultant, and then review and reflect on teaching practices with the consultant to assess room for improvement. Children whose teachers have participated in MyTeachingPartner demonstrate increased vocabulary and language growth, increased early literacy skills, basic phonological skills, and more effective relationships with teachers than students in the same schools whose teachers did not participate in a MyTeachingPartner consultancy (Pianta & Hamre, 2009).

3.3. Strategies Focusing on School Leadership and Working Conditions

Research suggests that school leadership and working conditions are two primary contexts that can mediate teaching and learning. These are particularly influential domains in terms of teacher retention. We find promising practices within both of these areas.

Training principals and teachers to be effective school leaders

School leadership is the second greatest in-school influence on student learning. As such, leadership is a key area to target for reform. The **Wallace Foundation** works to develop and test programs in state and district partner pilot sites that aim to improve the quality of leadership and leaders' impact on teaching and learning. According to the foundation's working definition of a "cohesive leadership system," widespread and sustainable leadership improvement, requires a high degree of coordination among state and district policies and practices that affect the standards and training of school leaders. A growing body of research commissioned or produced directly by the foundation explores new ideas and insights about leadership for learning. Some of these reports include:

- *Becoming a Leader: Preparing School Principals for Today's Schools* describes key features of effective principal training and offers lessons on how states and districts can work toward better training.
- *Preparing School Leaders for a Changing World*, by Stanford University researchers, provides case studies and guidelines for reinventing how principals are prepared for their jobs.
- *Getting Principal Mentoring Right: Lessons from the Field* analyzes common strengths and shortcomings of state and district mentoring programs and offers guidelines on how they might be improved.
- *How Leadership Influences Student Learning,* by researchers at the Universities of Minnesota and Toronto, outlines the vital role leadership plays in improving student performance.

Example: New Leaders for New Schools

The **New Leaders for New Schools** program has sought to transform school leadership across the country, with a special focus on disadvantaged urban school systems. The New Leaders program partners with 10 districts nationwide to recruit and train exceptional leaders to become outstanding principals in urban public schools. Potential new leaders enter the applicant pool through a nomination process and a selective evaluation of their beliefs and orientation toward student achievement, knowledge of teaching and learning, and demonstrated strategic management and leadership qualities. Leaders admitted to the program engage in a rigorous four-week training period that focuses on developing instructional and organizational leadership skills. After this initial training, leaders engage in a year-long residency in an urban school, during which they work with a mentor principal and attend two week-long seminars. The program pays salaries for participants during the training residency.

The RAND Corporation conducted a five-year evaluation of the impact of the NLNS model and found that graduates of the program have significantly impacted education in their schools. Students in elementary and middle schools led by NLNS principals for at least three years made academic performance gains faster than comparable students in their districts. In high schools led by NLNS principals, graduation rates exceed district averages. In addition, a number of NLNS-led schools have been identified as the most-improved or highest-performing schools in their respective cities and states.

Example: Leading Early Childhood Learning Communities

The National Association for Elementary School Principals (NAESP) created a professional development workshop for principals and directors of early-childhood centers called **Leading Early Childhood Learning Communities: Professional Development for Leaders**. These workshops are based on the standards established in NAESP's guide for leading early-learning communities. These standards include: enhancing classroom learning by engaging families and communities to support children at home; fostering collaborative teaching communities by giving educators the time and freedom to work with one another to improve teaching strategies; enacting appropriate interventions for students with developmental differences; and providing resources that enable teachers to implement developmentally appropriate practices. During a seven-day period, these workshops engage principals in a variety of activities that are intended to enhance their appreciation for the importance of the whole child approach to early-childhood learning and provide them with a set of strategies for incorporating effective early-learning principles and practices into schools. These trainings are used by individual community program providers and are featured in the National Association for the Education of Young Children's annual conferences.

Improving school working conditions

Another contextual area identified by research as important to teaching and learning relates to school working conditions. Although relatively few instances of direct investments in working conditions can be identified, this is an area that has seen at least modest philanthropic attention. The **Ford Foundation** has funded the Center for Teaching Quality's research on the connection between working conditions and teacher retention. Funding has been used to establish the center's Teacher Solutions: Teacher Working Conditions 2.0 initiative, which will examine qualitative and quantitative data to learn more about the factors that affect whether teachers remain in the profession. The center has studied teacher-turnover rates and is conducting research on working conditions in urban schools. In 2008, the Ford Foundation provided $500,000 to the Center for Teaching Quality to research the effect of working conditions on teacher-retention efforts in Boston, Chicago, Charlotte, N.C., and Clark County, Nev.

Example: The Benwood Initiative

In 2001, when an independent research organization identified eight of Chattanooga, Tenn.'s elementary schools among the top 20 worst schools in the state, district leaders teamed with two Chattanooga-based foundations to turn the schools around. The program was enacted with initial contributions of $5 million from the Benwood Foundation and $2.5 million from the Chattanooga-Hamilton County Public Education Foundation. The leaders of what became known as **the Benwood Initiative** sought to nurture a more collaborative relationship between the district and the local teachers' union, added assistant principals and reading specialists to improve instruction, and moved instructional support staff from the central office to inside the school buildings. These efforts, combined with financial incentives, such as mortgage assistance and subsidized master's programs for teachers, helped to foster a greater sense of investment and ownership among the teaching communities, in turn boosting teacher morale and improving the environment for collaborative and strategic teaching practices.

The improved conditions for teaching led to large achievement gains in both math and reading for students in the Benwood schools. In addition, according to data from the Chattanooga-Hamilton County Public Education Foundation, teacher attrition declined by more than half in Benwood schools from 2002 to 2006. In surveys conducted in 2004 and 2005, Benwood teachers reported valuing the opportunity to work in a school with a visionary principal and a professionally supportive environment more highly than the financial incentives they were receiving. Student performance also improved. From 2003 to 2008, rates of math proficiency among fifth graders increased from 57 percent to 91 percent, with substantial gains also observed in third-grade reading. The Benwood reforms have just entered a second five-year phase of improvements that will expand the initiative to eight additional schools in the county.

Example: Generation Schools Network

Generation Schools Network in Brooklyn, N.Y., seeks to reduce the organizational barriers that many potentially good teachers face, especially in high-need schools, so that they can provide well-prepared, engaging, and effective instruction to students. The organization opened its pilot charter school in September 2007 with one class of ninth graders and will serve students in grades 6 through 12 when fully scaled. A key of the school's strategy is the structuring of school time. Teachers instruct only three classes a day, get two hours of common planning with colleagues each afternoon, and have a highly reduced student load of as few as 14 students per class. Each morning, one group of educators teaches foundation courses in mathematics and the humanities. In the afternoon, those same teachers take on one studio course in science, the arts, and electives. They are also given daily breaks at the same time as their instructional team of colleagues in the same grade and content area, which provides two hours of common planning time. Teachers attribute the collegiality and strength of staff relationships to this model and value the time to work together to further their instructional capacities and ability to respond to student achievement. The Generation Schools Network, the non-profit organization that supports the charter school, receives funding from foundation grants, corporate donations, and gifts from private individuals.

4. Assessing the Philanthropic Landscape

The EPE Research Center conducted an environmental scan of the philanthropic landscape to characterize the nature and scale of existing grantmaking related to teaching quality. The first step in this process involved compiling data on educational grantmaking from publicly available sources (e.g., the Foundation Center) and reviewing three recent reports that examine philanthropic investments in education, broadly construed. The three reports used in the review are:

- The Grantmakers for Education (GFE)'s 2009 "Benchmarking Trends in Education Philanthropy," which highlights findings from GFE's most recent survey of foundation respondents;
- A briefing paper by the nonprofit Center for High Impact Philanthropy at the University of Pennsylvania, which has examined grantmaking around teaching quality, especially as that relates to at-risk secondary students; and
- The Philanthropy Roundtable-commissioned guidebook for donors by Andrew Rotherham from 2008.

The reports by the Center for High Impact Philanthropy and the Philanthropy Roundtable also proved to be especially helpful for suggesting promising targets for future foundation investments in the area of teacher quality. Key insights from those sources informed the final section of the current report.

A second goal of this environmental scan was to create a short list of the largest, most active teaching-quality funders as well as additional details on their general levels of investment. This section presents two related resources. The first is a list of education philanthropies that have made the largest investment in teacher quality issues. This listing reveals a strong emphasis on the K-12 sector in the associated grantmaking. In order to provide a more complete view of the teacher-quality landscape, a second list specifically examines major investments in the early-childhood area. The insight generated by this scan can help guide decisions about where promising opportunities for future high-impact investments may exist.

4.1. Overview of Philanthropic Investments in Teaching Quality

According to the Foundation Center, education consistently ranks as the single largest focal area for foundation support (Distribution of Foundation Grants by Subject Categories, circa 2007). Overall, the education sector received nearly 25 percent of all grants over $10,000 in 2007, the most recent year of data. Of the $5 billion given in support of education in 2007, $1.5 billion went to elementary and secondary education and more than $2 billion was given to higher education. These funds may well have been used to support such teaching-quality initiatives as teacher preparation, professional development, scholarships, incentives, or enhancing workplace improvements. However, reporting by the Foundation Center does not allow for a finer-grained analysis of grantmaking by detailed programmatic areas.

More nuanced findings can be obtained from work by Grantmakers for Education, an organization whose members include private, family, and community foundations, public charities, and other philanthropic interests concerned with education. Based on a survey of its membership, GFE finds that almost all of those philanthropies are engaged in supporting K-12 education in some respect, with about half also active in the early-childhood arena and roughly 40 percent engaged with higher-education issues. Many education-focused funders also support initiatives outside of traditional early childhood or K-12 settings, such as extended-school-time initiatives (50 percent) and workforce training (24 percent). Nearly two-thirds of responding GFE members reported focusing their grantmaking either in local communities or within one or two states. Three-quarters reported education grantmaking budgets of $5 million or less, while 9 percent reported working with budgets more than $20 million.

The annual GFE survey also provides more specific insight on philanthropic activity related to teaching quality. Over three-quarters of grantmakers reported supporting teacher professional development, with 21 percent identifying this as a growing area of focus. Forty percent of foundations are funding alternative new-teacher training programs, while almost 60 percent are investing in school and district leadership. GFE further notes a distinct philanthropic interest in exploring various human capital strategies for attracting and retaining teachers, including efforts to increase salaries and target incentives. Forty-eight percent of respondents reported investing in expanded access to high-quality prekindergarden. However, the extent to which that grantmaking focuses specifically on efforts to improve the quality of early-childhood teaching is unclear.

4.2. Major Funders

Most publicly available sources such as the three reports referenced above and the Foundation Center's lists of grantmaking available on its public Website offer an overview of philanthropic grantmaking in the broad area of education and, to a lesser extent, may touch on funding more specific to teaching quality. One goal of the present scan of the philanthropic landscape is to identify the top funders and the thrust of their recent grantmaking related to teaching quality. Such information can be used to surface promising programs and improvement strategies, inform strategic opportunities for investment, and suggest potential partners who are established leaders in this field.

Certain pieces of information related to overall levels of philanthropic investment in education, leading funders, topical focus of education grantmaking, and related issues can be obtained from a variety of sources. However, there is no single, comprehensive listing of philanthropies that have made major investments specifically in the area of improving teaching effectiveness, as it has been defined in this report. As a result, it was necessary to synthesize data from several different sources, each of which provides a key piece of information about or perspective on teacher-focused initiatives. Those sources included:

- The Foundation Center's list of the *Top 50 U.S. Foundations Awarding Grants for Elementary and Secondary Education, circa 2007*
- The Foundation Center's list of the *Top 25 Foundations Awarding U.S. Focused Grants for Education, circa 2007*
- The Philanthropy News Digest, the Foundation Center's daily news service that features philanthropic-related articles appearing in the media. A keyword search of this database (employing the term "teacher") was used to identify foundations giving to teacher-related issues in 2009-2010.

The first step in our process involved building a master listing of foundations cited by any of the four sources described above. This compilation resulted in an initial list of more than 200 foundations. Next, we reviewed additional, more detailed information from foundation Websites to determine which organizations were involved in work related to teacher-quality issues. Those not active in this area were removed from consideration. Among the remaining organizations, we identified funders that appeared on the majority of the lists mentioned above.

In the end, based on this methodology, we identified a total of 11 foundations as major funders in the area of teaching quality and effectiveness. The validity of this list was confirmed by consulting three additional sources. Our list was cross-referenced against the Foundation Center's *Foundation Directory Online* to confirm that "teacher school/education" was reported as a field of interest for those organizations. We also compared our list with foundations that appear in the appendix of the Philanthropy Roundtable's *Achieving Teacher and Principal Excellence: A Guidebook for Donors* and consulted with two journalists familiar with foundations active in the area of teaching quality.

Table 1: Major Funders of Teacher Effectiveness

Foundation	Areas of Focus	Scale of Related Teacher Effectiveness Investments	Sample Grantees
Bill & Melinda Gates Foundation* www.gatesfoundation.org	Identifying multiple measures of teacher quality Recruitment and retention of quality teachers for high-needs schools	$290 million for Intensive Partnership for Effective Teaching $45 million for Measures of Effective Teaching (2009)	Hillsborough County Public Schools for Intensive Partnership for Effective Teaching ($100,000,000)
Carnegie Corporation of New York www.carnegie.org	Data systems Recruitment and retention of quality teachers for high-needs schools Teacher preparation	$15 million (2008)	Academy for Educational Development for Teachers for a New Era ($3,728,700)
The Eli and Edythe Broad Foundation www.broadfoundation.org	Pay-for-performance programs Recruitment and retention of quality teachers for high-needs schools	$19 million (2008)	Teach for America ($25,000,000)
Ford Foundation www.fordfound.org	Recruitment and retention of quality teachers for high-needs schools Teacher preparation	$4 million (2009)	New York University for the Research Alliance for New York City Schools ($500,000)
The Joyce Foundation* www.joycefdn.org	Recruitment and retention of quality teachers for high-needs schools Teacher compensation and pensions Teacher evaluation	$8 million (2008)	The New Teacher Project ($1,000,000)
JPMorgan Chase Foundation www.jpmorganchase.com	Professional development Recruitment and retention of quality teachers for high-needs schools	Not available[1]	National Board for Professional Teaching Standards ($1,000,000)
Lilly Endowment www.lillyendowment.org	Engagement, intellectual growth, and personal renewal of teachers Recruitment and retention of quality teachers for high-needs schools Teacher preparation	$2 million (2008)	Woodrow Wilson National Fellowship Foundation ($10,161,106)
Michael & Susan Dell Foundation* www.msdf.org	Performance management tools Recruitment and retention of quality teachers for high-needs schools Teacher preparation	$15 million (2009)	Teach for America ($6,000,000)
Silicon Valley Community Foundation www.siliconvalleycf.org	Professional development Math instruction	$1.1 million for professional development (2009)	New Teacher Center and Silicon Valley New Teacher Project ($100,000)
The William and Flora Hewlett Foundation www.hewlett.org	Data on teacher performance Professional development Teacher preparation	$9 million (2008)	New Teacher Center ($3,000,000)
W.K. Kellogg Foundation* www.wkkf.org	Recruitment and retention of quality teachers for high-needs schools Teacher preparation	$17 million (2009)	Woodrow Wilson National Fellowship Foundation ($16,762,229)

* Indicates foundations with prominent early-childhood initiatives.

Footnote:
1: Details on specific investments in teacher effectiveness could not be located.

Table 1 displays key information about these funders, including their major areas of focus within the teacher-quality arena and key grants or initiatives illustrating their financial commitments. In order to provide some indication of the overall scale of philanthropic investments in teacher effectiveness, we reviewed recent annual reports and grants databases for the focal foundations to compile information on investments related to teacher quality for a given year. These amounts were tallied to arrive at the sums listed in the table below. Examples of grantees receiving large awards are also included in Table 1, to provide some sense of the scope and emphasis of philanthropic activity.

As a general pattern, the majority of these top-funding philanthropic organizations seem willing to support new and innovative programs and strategies aimed at developing fresh knowledge or testing cutting-edge approaches to challenges in the area of teacher quality. Programmatic initiatives aimed at changing teaching practices in states and school districts are often coupled with funding for research projects designed to evaluate the success of novel initiatives. An examination of focal areas across the major funders reveals that upgrading the quality of teaching in urban schools is a common priority. A number of those efforts focus specifically on recruitment and retention of qualified teachers in high-needs schools. Another recurring interest for this group of foundations is investing in better ways to prepare and train teachers, an area in which the field has long struggled.

An analysis of information from the Foundation Directory Online revealed that four of these funders have sponsored early-childhood initiatives. The extent to which these efforts address issues of teaching quality appears to be limited:

- In May 2008, the **Bill and Melinda Gates Foundation** and **Thrive By Five Washington** announced $5 million support of two early-learning demonstration communities in Washington state, for children birth to age 5. These two sites (Ready by Five in East Yakima, Wash., and the Seattle-based White Center) are each designing model learning centers in their areas. Ready by Five is working to create "a sustainable, integrated, and accessible system for early learning, child development and family support services for the children and families of East Yakima", which includes family- and community-based, early-learning efforts in an effort to surround children with high-quality, early-learning environments (www.gatesfoundation.org/press-releases/Pages/thrive-by-five-ready-by-five-080509.aspx). The White Center Early Learning Initiative is a partnership of public and private organizations and community members working to create comprehensive child development and family support services (www.wceli.org). This initiative couples education and support for parents and caregivers with childcare and early-learning opportunities for children, to ensure all children begin school ready to succeed. Services available include caregiver and child playgroups, weekly meetings for families to discuss early-childhood developmental issues, childcare and preschool programs, and services for new and expecting mothers. The programs incorporate Head Start and Early Head Start, and are available to children from low-income families in the greater Seattle area.

- The **Joyce Foundation** has funded 35 grants since 2003 focused specifically on early-childhood education. These grants have supported universities and institutes to conduct further research on the economic impact of the early-care-and-education industry in various regions, to examine the effects of different inputs on prekindergarten program quality and child outcomes, and to identify strategies for increasing the number of certified early-childhood teachers in urban centers. Other grants funded more advocacy-oriented work, such as promoting policies to increase preschool access for the most isolated and at-risk children, educating policymakers and stakeholders about the importance of high-quality prekindergarten, and helping policymakers primarily in Illinois, Wisconsin, and Michigan develop policies and programs for delivering high-quality early education through school- and community-based settings (www.joycefdn.org/content.cfm/early-childhood-education).

- Since 2004, the **Michael & Susan Dell Foundation** has made a series of investments in the Harlem Children's Zone program. In October 2004, the Foundation granted $1 million to the program to expand its Harlem Gems extended day/extended-year pre-K program in conjunction with Head Start and Harlem Children's Zone in Central Harlem. In May 2006, the Foundation made a second grant of $1 million to the Harlem Children's Zone to support the expansion of the Baby College program, which provides parenting skills and other supports to Harlem Children's Zone residents who are either expecting a child or raising one between the ages of zero to three. In December 2008, the foundation renewed the grant to the Harlem Children's Zone to continue support for the Baby College and

Harlem Gems programs (www.msdf.org/Grants/Master_Grant_List.aspx). The foundation has also invested in early education in India.

- In February 2009, the **W.F. Kellogg Foundation** announced a $500,000 investment over five years in Acelero Learning, a for-profit company that supports local Head Start programs in Nevada and New Jersey. This initiative seeks to improve outcomes for children, raise teacher salaries, and increase the number of children served in Head Start programs (www.wkkf.org/news/Articles/2009/02/Kellogg-Foundation-Invests-in-Acelero-Learning.aspx). The foundation also supports research and programs involving early-childhood education in general. It currently funds $4.5 million to the Ounce of Prevention Fund to expand high-quality, early-childhood education and care for low-income children ages birth to five, and a $1.9 million grant to the Institute for Educational Leadership for research to demonstrate the strategic linkages between high-quality comprehensive early-childhood opportunities; effective community schools; and better results for at-risk children. The foundation engages in grantmaking for community outreach through a $5 million grant to the Washington Early Learning Fund to improve rates of school readiness in Washington state communities by enhancing parent education and exploring new approaches to improve the quality of early learning.

The 11 major funders highlighted in Table 1 were selected because they were independently identified by several key lists of foundations active in education and their focus on teacher quality. While this process for highlighting the top philanthropic funders in the area of teaching quality did not exclude foundations engaged in work on early-childhood education, it did not specifically target this sector either.

In order to capture important initiatives within the early-childhood arena, we asked two early-learning experts to name the foundations most active in teacher quality issues related to early learning. While both experts noted that few philanthropies focus specifically on teaching, they collectively identified five additional foundations (as well the Kellogg Foundation, already noted above) with active early-childhood grantmaking (see Table 2). The Birth to Five Alliance (www.birthtofivepolicy.org) was also cited as an important player. This collaboration, formed in 2005, includes seven investors: the Buffett Early Childhood Fund, the W.K. Kellogg Foundation, the Bill & Melinda Gates Foundation, the JB and MK Pritzker Family Foundation, the George Kaiser Family Foundation, the Irving Harris Foundation, and an anonymous donor.

Table 2 profiles early-childhood efforts for these additional foundations. This listing lacks details about the scale of investments because it was generally not possible to isolate information about early-childhood teaching as a distinct funding category. Challenges in identifying funding specifically dedicated to preschool teaching initiatives may stem from the propensity for projects in the early-childhood arena to combine a variety of services, including education, health care, and nutrition in a single program. In K-12 education, teacher-quality initiatives appear more likely to receive discrete funding streams.

As a whole, the five foundations have been engaged in a variety of funding efforts aimed at improving the availability and quality of early-childhood education programs, particularly in low-income communities. Their approaches often involve projects designed to build public support for preschool programs and to increase policymakers' awareness of the need for greater access to such services. Funding is also commonly directed toward research on the effectiveness of programs for young children. The activities of these organizations are described below.

Table 2: Major Funders of Early-Childhood Efforts

Foundation	Areas of Focus	Sample Grantees
The Annie E. Casey Foundation www.aecf.org	Access to high-quality, early-childhood services in low-income communities	Maryland Business Roundtable for Education for Maryland Early Care and Education Committee ($18,000)
Buffett Early Childhood Fund www.buffettearly.org	Advocacy and research on early-childhood- education programs	Nebraska Association for the Education of Young Children for T.E.A.C.H. program ($110,611)
The David & Lucile Packard Foundation www.packard.org	Adequacy of early-childhood-education workforce Certification of early-childhood teachers	California State University Foundation ($20,000)
Foundation for Child Development www.fcd-us.org	Professional development Teacher compensation and qualifications Teacher preparation	American Educational Research Association ($223,698)
The Pew Charitable Trusts www.pewtrusts.org	Advocacy for high-quality, state-funded, pre-k programs Research on pre-k teacher education, preparation, and training requirements	Child Care Services Association for T.E.A.C.H. Early Childhood Project ($300,000)

The Annie E. Casey Foundation promotes access to high-quality early-childhood services, especially in low-income neighborhoods. It has focused on identifying programs that support informal early-childhood-care providers such as family members. In addition, the foundation has made third grade reading achievement a target area and works to support initiatives that may increase the odds of student success in the early years of elementary school. An example of its funding efforts in the early-childhood education arena can be found in a grant to the Maryland Business Roundtable for Education for the Maryland Early Care and Education Committee. One goal outlined by that committee is to ensure that early-childhood-education providers receive appropriate professional development and training.

The Buffett Early Childhood Fund seeks to increase awareness of the need for early-childhood education and to improve the chances that disadvantaged children receive adequate services. With national funding and a focus on investments in Nebraska, it supports efforts to promote policy changes and to increase research on this topic. To that end, it has funded Educare Centers which provide early-childhood education to low-income children across the nation. Additional giving assists the Birth to Five Policy Alliance and the First Five Years Fund in their national efforts to intensify and expand advocacy for policy changes in the area of early-childhood education. The fund also supports research on the effectiveness of early-childhood programs at the Harvard Center on the Developing Child. One example of the organization's philanthropic work on teaching can be seen in a grant to the Nebraska Association for the Education of Young Children for the T.E.A.C.H. program. That initiative provides scholarships for providers to earn associate's or bachelor's degrees in early-childhood education.

The Foundation for Child Development also plays an active role in the early-childhood arena. Through its PK-3 Initiative, the foundation supports the restructuring of prekindergarten, kindergarten, and grades 1 to 3 into a well-aligned first level of public education for children (age 3-8) in the United States. Its grants focus on stimulating basic and applied research on

children (birth through age 8), particularly those living in low-income, immigrant families. The foundation makes roughly 14 grants per year.

The David & Lucile Packard Foundation funds advocacy and research intended to strengthen early-childhood education with a focus on preschool programs in California. Through its Preschool for California's Children initiative, it works to expand access to high-quality, early-childhood programs for disadvantaged children and to identify and support programs illustrating best practices. A 2009 grant to the California State University Foundation illustrates one effort to increase research on policies regarding early-childhood teaching. The grant funds a study on early-childhood teacher certification in various states with the goal of informing policy in California.

The Pew Charitable Trusts has been a major funder of research and advocacy initiatives focused on early-childhood education. For instance, it supports the National Institute for Early Education Research. Housed at Rutgers University's Graduate School of Education, the center conducts objective, nonpartisan research on early-childhood education, including 50-state assessments of pre-kindergarten enrollment, quality standards, and evaluations of state-funded pre-k programs. The Pew Center on the States also operates Pre-K Now, a campaign that collaborates with advocates and policymakers across the country to lead a movement for high-quality, voluntary pre-kindergarten for all 3- and 4-year-olds. In targeted states and at the federal level, Pre-K Now provides strategic advice, technical assistance, and resources to promote increased funding and quality for state pre-k programs.

Many additional funders, beyond those listed above, sponsor initiatives that support teaching quality. Ultimately, once a philanthropic institution identifies a strategic direction, it may prove useful to revisit this philanthropic landscape in order to identify potential funding partners that include both like-sized and larger foundations.

5. Conclusion and Recommendations

This section synthesizes insights drawn from our analysis of the research literature on teacher quality and effectiveness, prominent reform strategies and initiatives, and the philanthropic grantmaking landscape in this area, as presented earlier in this report. Our goal is to identify a set of key issues that foundations or other interested organizations may wish to consider as it continues to develop a targeted investment strategy for promoting teacher effectiveness and student learning. We begin with a top-line summary of the major points from the main sections of the report and conclude by discussing several decision points for consideration.

5.1. What Is Known — Research Findings, Strategies, and Grantmaking

Areas of Research Consensus

Our **review of the relevant research** revealed that the field has accumulated a significant base of knowledge regarding teaching quality and its links to student learning. The findings of that research are most conclusive in the following areas:

General Importance of Quality Teaching

- The two strongest in-school influences on student learning are teaching and school leadership, the latter to a lesser extent.
- The year-long and cumulative effects on student achievement of having a qualified teacher can be measured and have been found to be substantial.

Key Teacher Characteristics

- Teachers' own scores on college-entrance and certification exams positively relate to greater student achievement.
- A teacher's experience exerts a positive impact on student achievement, although that effect subsides after the first few years in the classroom.

High-Impact Areas

- In mathematics, several factors have been consistently found to exert a positive influence on student achievement gains: teacher coursework, degree attainment, and certification, coupled with pedagogical training in how to teach mathematics.
- The impacts of factors related to teaching quality also appear to be more consistent at the high school level, particularly in mathematics.

In-Need Student Populations

- Low-income and minority students tend to have less-effective teachers as signaled by such characteristics as: lack of certification in the subjects they are teaching; failure to pass certification exams; matriculation at the least competitive undergraduate institutions; and poor performance in prior academic settings.
- Low-income and minority students also experience greater turnover rates among teachers at their schools.

Workplace Environment and Leadership

- With respect to teacher recruitment, workplace conditions such as guaranteed planning time, additional support, and reduced class sizes appear to be more powerful inducements than salaries or monetary incentives.
- Leadership and working conditions matter a great deal to teaching and learning. These contextual forces directly affect both teacher-retention rates within particular schools and likelihood that teachers will remain within the profession.

Effective Teacher Training

- The qualities of effective professional development that have been found to directly affect teaching knowledge and practice include opportunities that: are grounded in subject-matter content; involve extensive engagement; build on what teachers already know; engage educators directly; and involve teams of teachers from the same school.

New Approaches to Teacher Evaluation

- An emerging consensus appears to be forming that traditional teacher evaluation methods are inadequate and inconsequential in ensuring a quality teaching workforce. For this reason, a stronger reliance on student learning as a focal criterion for evaluation, value-added approaches that more rigorously attribute improved student outcomes (typically test scores) to individual teachers, and the use of multiple measures or criteria to ensure a more holistic assessment of performance are gaining political momentum as a basis for next-generation models of teacher evaluation.

Knowledge Gaps

There have also been repeated **calls for additional research** to fill a number of persistent gaps in the field's knowledge base. The most frequently cited areas where additional research could be particularly beneficial include investigations of:

- The substance of teacher preparation programs and the impact of particular types of training on student performance;
- The links between induction, mentoring, professional development, and teacher practice and student learning;
- The relationship between teacher characteristics and student achievement in reading and at the elementary school level in all core academic subjects;
- The extent to which higher salaries lead to increased teacher effectiveness; and
- How different approaches to teacher evaluation impact teacher practice and student learning.

In addition, our understanding of the connections between teaching effectiveness and student learning during the early-childhood years would benefit from further research in several areas: identifying the characteristics of high-quality programs; supporting early intervention to close achievement gaps; and more effectively linking early education to the K-12 system.

Strategies and Programmatic Approaches

Our **review of strategies** to influence the dynamics between teaching quality and student learning found:

- Significant levels of policy interest and programmatic activity concerned with improving human capital and within-school leadership;
- Comparatively less activity around efforts to improve either teacher qualifications (beyond initial teacher preparation) or school working conditions;
- A particular emphasis, among the general strategies investigated, on targeting teaching quality for low-income communities, urban schools, and districts with high concentrations of minority students;
- A similar concentration of efforts among the individual programs highlight promising practices within high-poverty, urban settings.
- Exemplary programs and strategies attempted to improve teacher quality through a variety of distinct approaches, including: teacher preparation and credentialing, financial and salary supplements, teacher evaluation, mentoring for new teachers, professional development, training for principals and school leaders, and efforts to improve school working conditions; and
- The strong focus on urban, low-income environments proved to be less pronounced among profiled strategies involving teacher evaluation, which tend to encompass a broader range of settings.

The Philanthropic Landscape

As the **findings from the philanthropic environmental scan** reveal:

- Foundations of all shapes and sizes are supporting a variety of initiatives concerning teaching quality;
- Funders have generally prioritized investment in teaching policies and practices targeted at urban schools;
- Funders are also focused strongly on recruitment and retention of qualified teachers for high-poverty and high-minority schools; and
- Teacher preparation and training initiatives are common elements of funding strategies.
- With respect to early-childhood funding, most philanthropic efforts are aimed at improving the availability and quality of early-childhood education programs, particularly in low-income communities; emphasize projects designed to build public support for preschool programs and to increase policymakers' awareness of the need for greater access to them**;** and direct funding toward research on the effectiveness of programs for young children.

This summary across the major lines of review covered in this report may prove helpful to philanthropic organizations as a tool for considering future grantmaking investments.

5.2. Future Directions and Recommendations

Foundation and other institutions are likely to face several key decision points when refining investment strategies in the area of teaching quality and effectiveness. In the interest of informing those deliberations, we have identified a series of considerations or recommendations based on our analysis of the research-based literature, prominent reform and intervention strategies, and the philanthropic landscape. These recommendations are not intended to be comprehensive or mutually exclusive. Nonetheless, we believe that engagement with these major decision points, consideration of the benefits and limitations presented by each, and evaluation of their alignment with an institution's mission and established priorities will provide a constructive next-step in its investment strategy.

Build on solid evidence

This approach would leverage the existing knowledge base of insights from past research and programmatic experience to concentrate on the factors that have been demonstrated to be most influential in affecting teaching and learning.

Create new knowledge

Researchers, funders, and other organizations have clearly identified some key areas where the knowledge base could be stronger and where the field would benefit from added or more nuanced understandings. Investing in additional research or targeted pilot programs could help fill the gaps in our knowledge about quality teaching and improvements in learning. Notably, Andrew Rotherham, the Center for High Impact Philanthropy, and Grantmakers for Education survey respondents all suggest prioritizing grantmaking to explore human capital investments such as the recruitment, retention, and distribution of talent, including the use of salaries and incentives to reward excellence. In addition, as discussed earlier, some particularly basic questions regarding teaching quality and learning remain unanswered, including issues related to: teacher preparation, evaluation systems, pay-for-performance models, compensation as a lever for retention and motivation, and recruitment and distribution of the talent pool. Additional research is also needed on the relationship between teacher characteristics and student achievement in reading and at the elementary school level in all core academic subjects.

Replicate successful programs

A Foundation might also consider investing in programs and practices with solid evidence supporting their success in terms of improving teaching and learning. A first step would require identification of programs with proven track records. The review provided in Section 3 of this report might offer a useful starting point. A replication-focused strategy might entail bringing successful programs to new locations or schools, involving new individuals in pre-existing efforts, or some combination of those approaches. Investment in program replication may be a relatively low-risk proposition, provided that the program or model selected is a sound one with an adequate grounding in research-based knowledge and a track record of effectiveness in well designed evaluations. But even then, debates over scale-up strategies and the importance of context to replication would caution that success in one place does not guarantee success in another. The Dell Foundation's replication of UTeach is an example of a foundation supporting the scale-up of existing models developed elsewhere.

Develop new programs

This approach carries with it both opportunity and risk, but has the potential to spark important discovery. New program development, as a strategy, might couple well with a desire to build new knowledge in an important area. This might involve, for example, investing in a pilot program that seeks to enact (and evaluate) substantially unproven interventions for improving the quality of teaching and enhancing its impacts on student learning. The Gates Foundation has taken this approach through its recent Understanding Teacher Quality project to develop unique initiatives. This route carries a somewhat higher risk in that it seeks to break new ground versus rely on ground known to be fertile.

Leveraging existing initiatives

Many structures, routines, programs, initiatives, paradigms, and organizations already exist in the teaching quality arena at large. Focusing investment in such areas could make use of momentum already underway. Research on professional development, for example, notes that the most successful learning efforts are ones that (among other qualities) seek to build on a foundation of what teachers already know. A foundation could work closely with an existing teacher preparation program, for instance, to institute changes along the lines suggested by researchers such as Arthur Levine (i.e., connecting more directly and meaningfully to teaching practice). Alternatively, if a state or local entity mandates dedicated time for professional development, foundation or other investments could be targeted to promote the effective use of that time by supporting effective training content and techniques.

Funding evaluation

Should a foundation decide to target an organization for potential funding, it will be important to identify and agree upon specific evaluation methods and indicators that will be used to measure program results. Any evaluation plan should specify what will be measured and how, and should be clearly understood and agreed upon by both parties (i.e., the foundation and any grantee) prior to financial investment on the part of the foundation.

Advocate for policy

Policy matters to the contexts in which reforms unfold. Grantmaking could strategically target state or local policy to institute more supports for teaching and learning. For example, the Broad Foundation has worked with district and union officials in their contract negotiations to exert influence in Denver's ProComp salary model. Other efforts might include lobbying of officials for targeted changes in policy.

Breadth and depth of investment

One important consideration for any foundation will be whether an investment should be broad or narrow in scope. A broad investment could extend reach by distributing resources across multiple school systems, by focusing on higher-level state or local policymaking, or by engaging in regional or national efforts. Over-extending reach, however, could potentially dilute the impact of those investments. A more narrowly tailored scope of investment, on the other hand, would require deliberate decisions about the issues and communities in which the foundation would most like to have an effect. Such a strategy might mean working with a single elementary or secondary school, a college's or university's teacher preparation program, a particular subject area, or a cohort of students or teachers in a school. This might also entail a decision between focusing on early-childhood or the K-12 system. These are two very different systems with different issues, and focusing on both simultaneously risks splitting focus and attention unnecessarily.

Consensus areas

Initial and ongoing teacher and principal training were two recommended areas for prioritizing grantmaking mentioned by all three reports and organizations reviewed for this report: GFE survey respondents, the Philanthropy Roundtable's Guidebook for Donors report by Andrew Rotherham, and the Center for High Impact Philanthropy. Identifying programs that specifically target educator training (preservice and inservice, alike) may be options for the foundation to consider supporting financially.

Explore partnerships

A foundation may wish to consider pursuing partnerships, which could offer a strategy for maximizing the effectiveness of its investments and their impact on improving teaching and learning. One form of partnership could involve collaborating with other funders with similar priorities. Other partnerships to consider might include ones with individual schools and school districts, with colleges and universities that have teacher preparation programs, and with researchers. Joint effort can make

larger scale initiatives possible -- and may reduce entry costs if partners are already established in particular topic areas of interest. However, partners should be chosen and collaborations entered into carefully so that joint work can proceed in keeping with the foundation's mission and priorities.

The issues outlined above are likely to capture many of the key areas for deliberation and decision by foundations interested in targeting their investments in teaching and learning. In addition, foundations may wish to consider the level of risk associated with various investment strategies, as well as the maturity of existing programmatic innovations and interventions and the scale of established grantmaking in the respective areas.

References

Ackerman, D. J. (2005). Getting teachers from here to there: Examining issues related to an early care and education teacher policy. *Early Childhood Research & Practice, 7.* Retrieved from http://ecrp.uiuc.edu/v7n1/ackerman.html

Ball, D. L., & Cohen, D. K. (1999). Developing practices, developing practitioners: Toward a practice-based theory of professional development. In G. Sykes & L. Darling-Hammonds (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 30–32). San Francisco, CA: Jossey-Bass.

Baratz-Snowden, J. (2009). *Fixing tenure: A proposal for assuring teacher effectiveness and due process.* Washington, DC: Center for American Progress. Retrieved from http://www.americanprogress.org/issues/2009/06/teacher_tenure.html

Barnett, W. S., Epstein, D. J., Friedman, A. H., Boyd, J. S., & Hustedt, J. T. (2009). *The state of preschool: 2008 state preschool yearbook*. New Brunswick, NJ: Rutgers University, National Institute for Early Education Research. Retrieved from http://nieer.org/yearbook/

Berry, B., Hopkins-Thompson, P., & Hoke, M. (2002). *Assessing and supporting new teachers: Lessons from the Southeast*. Chapel Hill, NC: Southeast Center for Teaching Quality. Retrieved from http://www.teachingquality.org/pdfs/Induction.pdf

Berry, B., Montgomery, D., & Snyder, J. (2008). *Urban teacher residency models and institutes of higher education: Implications for teacher preparation*. Washington, DC: National Council for Accreditation of Teacher Education. Retrieved from http://www.ncate.org/documents/news/UTR_IHE_Aug122008.pdf

Betts, J. R., Ruben, K. S., & Danenberg, A. (2000). *Equal resources, equal outcomes? The distribution of school resources and student achievement in California*. San Francisco, CA: Public Policy Institute of California. Retrieved from: http://www.ppic.org/content/pubs/report/R_200JBR.pdf

Blank, R. K., de las Alas, N., & Smith, C. (2008). *Does teacher professional development have effects on teaching and learning: Analysis of evaluation findings from programs for mathematics and science teachers in 14 states*. Washington, DC: Council of Chief State School Officers. Retrieved from http://www.ccsso.org/content/pdfs/cross-state_study_rpt_final.pdf

Blank, R. K., & de las Alas, N. (2009). *Effects of teacher professional development on gains in student achievement: How meta analysis provides scientific evidence useful to education leaders*. Washington, DC: The Council of Chief State School Officers. Retrieved from http://www.ccsso.org/content/pdfs/Final%20Meta%20Analysis%20Paper%20full.pdf

Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2006). How changes in entry requirements alter the teacher workforce and affect student achievement. *Journal of Education Finance and Policy, 1,* 176-216.

Boyd, D., Lankford, H., Loeb, S., & Wyckoff, J. (2005). Explaining the short careers of high-achieving teachers in schools with low-performing students. *American Economic Review, 95*(2), 166-171.

Boyd, D., Loeb, S., Wyckoff, J., Lankford, H., & Rockoff, J. (2008). The narrowing gap in New York City teacher qualifications and its implications for student achievement in high-poverty schools. *Journal of Policy Analysis & Management, 27,* 793-818. Retrieved from http://www.teacherpolicyresearch.org/portals/1/pdfs/JPAM%20Narrowing%20the%20Gap.pdf

Brandt, C., Mathers, C., Oliva, M., Brown-Sims, M., & Hess, J. (2007). *Examining district guidance to schools on teacher evaluation policies in the midwest region* (REL 2007–No. 030). Washington, DC: Institute for Education Sciences Regional Education Laboratory Program.

Bryant, D., Downer, J., Hamre, B., Howes, C., Pianta, R., & Soliday-Hong, S. (2008). *Ensuring effective teaching in early childhood education through linked professional development systems, quality rating systems and state competencies: The role of research in an evidence-driven system* (White Paper). Charlottesville, VA: National Center for Research in Early Childhood Education. Retrieved from http://www.ncrece.org/wordpress/wp-content/.../09/ncrecewhitepaper2008.pdf

Bryk, A. S., & Schneider, B. L. (2002). *Trust in Schools : A Core Resource for Improvement*. New York, NY: Russell Sage Foundation.

Bueno, M., Darling-Hammond, L., & Gonzales, D. (2010). *A matter of degrees: Preparing teachers for the pre-K classroom* (Education Reform Series). Washington, DC: The Pew Center on the States. Retrieved from http://www.pewtrusts.org/our_work_report_detail.aspx?id=57676

Burchinal, M., Mashburn, A., Pianta, R., & Vandergrift, N. (2009). Threshold analysis of association between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly, 25,* 166-167.

Carroll, T. G., & Foster, E. (2010). *Who will teach? Experience matters*. Washington, DC: National Commission on Teaching and America's Future. Retrieved from http://nctaf.org/WhoWillTeachExperienceMatters.htm

The Center for High Impact Philanthropy. (2010). *High impact philanthropy to improve teaching quality in the U.S.* (Blueprint). Philadelphia, PA: The Center for High Impact Philanthropy. Retrieved from http://www.impact.upenn.edu/our_work/documents/UPenn_CHIP_TQProjectBlueprint_Mar10.pdf

Chait, R. (2010). *Removing chronically ineffective teachers: Barriers and opportunities*. Washington, DC: Center for American Progress. Retrieved from http://www.americanprogress.org/issues/2010/03/teacher_dismissal.html

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2006). *Teacher-student matching and the assessment of teacher effectiveness* (Working Paper 11936). Cambridge, MA: The National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w11936

Coburn, C. E. (2003). Rethinking scale: Moving beyond numbers to deep and lasting change. *Educational Researcher, 32*(6), 3-12.

Coggshall, J. G., & Ott, A. (with Lasagna, M). (2010). *Retaining teacher talent: Convergence and contradictions in teachers' perceptions of policy reform ideas*. Naperville, IL: Learning Point Associates. Retrieved from http://www.learningpt.org/expertise/educatorquality/genY/Convergence_Contradictions.pdf

Cohen, D. K., & Hill, H. (2000). Instructional policy and classroom performance: The mathematics reform in California. *Teachers College Record, 102,* 294-343.

Cohen, D. K., Raudenbush, S., & Ball, D. L. (2002). Resources, instruction, and research. In F. Mosteller & R. Boruch (Eds.), *Evidence matters: Randomized trials in education research*, (pp. 80–119). Washington, DC: Brookings Institution Press.

Connors, S., Nearing, K., & Walters, B. (2006). *Summary of evaluation studies for the Boettcher Teachers Program.* Denver, CO: The Evaluation Center, University of Colorado at Denver.

Constantine, J., Player, D., Silva, T., Hallgren, K., Grider, M., & Deke, J. (2009). *An evaluation of teachers trained through different routes to certification* (NCEE Publication No. 2009-4043). Washington, DC: The Institute of Education Sciences. Retrieved from http://ies.ed.gov/ncee/pubs/20094043/index.asp

Darling-Hammond, L., & Haselkorn, D. (2009, April 1). Reforming teaching: Are we missing the boat? *Education Week,* pp. 30, 36. Retrieved from http://www.edweek.org/ew/articles/2009/04/01/27hammond.h28.html

Darling-Hammond, L., Wei, R. C., Richardson, N., Andree, A., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on professional development in the U.S. and abroad*. Washington, DC: National Staff Development Council.

Desimone, L., Porter, A. C., Garet, M., Yoon, K. S., & Birman, B. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis, 24,* 81-112.

Donaldson, M. (2009). *So long, Lake Wobegon?: Using teacher evaluation to raise teacher quality*. Washington, DC: Center for American Progress.

Donaldson, M., & Peske, H. G. (2010). *Supporting effective teaching through teacher evaluation: A study of teacher evaluation in five charter schools*. Washington, DC: Center for American Progress. Retrieved from http://www.americanprogress.org/issues/2010/03/teacher_evaluation.html

Duffett, A., Farkas, S., Rotherham, A. J., & Silva, E. (2008). *Waiting to be won over: teachers speak on the profession, unions and reform*. Washington, DC: Education Sector.

Editorial Projects in Education. (2010). Quality counts: Fresh course, swift current [Special Issue]. *Education Week, 29*(17).

Educational Testing Services. (2009). *The Praxis series: Teacher licensure and certification Praxis I overview*. Retrieved from http://www.ets.org

Educational Testing Services. (2009). *The Praxis series: Teacher licensure and certification Praxis II overview*. Retrieved from http://www.ets.org

Ehrenberg, R. G., & Brewer, D. J. (1994). Do school and teacher characteristics matter? Evidence from high school and beyond. *Economics of Education Review, 13,* 1-17.

Ehrenberg, R. G., & Brewer, D. J. (1995). Did teachers' verbal ability and race matter in the 1960s? Coleman revisited. *Economics of Education Review, 14,* 1-21.

Elicker, J., Langill, C. C., Ruprecht, K., & Kwon, K.-A. (2007). *Paths to quality: A child care quality rating system for Indiana—What is its scientific basis?* West Lafayette, IN: Purdue University, Center for Families and Department of Child Development and Family Studies. Retrieved from http://www.cfs.purdue.edu/cff/documents/.../07_paths_to_quality.pdf

Elmore, R. (1996). Getting to scale with good educational practice. *Harvard Educational Review, 66,* 1-27.

Ferguson, R. F. (1991). Paying for public education: New evidence on how and why money matters. *Harvard Journal of Legislation, 28,* 465-498.

Ferguson, R. F. (1998). Can schools narrow the black-white test score gap?. In C. Jencks & M. Phillips (Eds.), *The black-white test score gap*. Washington, DC: Brookings Institution Press.

Ferguson, R. F., & Ladd, H. F. (1996). How and why money matters: An analysis of Alabama schools. In H.F. Ladd (Ed.), *Holding schools accountable: Performance based reform in education*. Washington, DC: Brookings Institution Press.

Figlio, D. (1997).Teacher salaries and teacher quality. *Economics Letters, 55,* 267-272.

Frede, E., Jung, K., Barnett, W. S., & Figueras, A. (2009). *The APPLES blossom: Abbott preschool program longitudinal effects study (APPLES) preliminary results through 2nd grade* (Interim Report). New Brunswick, NJ: Rutgers University, National Institute for Early Education Research. Retrieved from http://ieer.org/pdf/apples_second_grade_results.pdf

Garet, M. S., Cronen, S., Eaton, M., Kurki, A., Ledwig, M., Jones, W., et al. (2008). *The impact of two professional development interventions on early reading instruction and achievement*. Washington, DC: Institute of Education Sciences.

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38,* 915-945.

Goe, L. (2007). *The link between teacher quality and student outcomes: A research synthesis*. Washington, DC: National Comprehensive Center for Teacher Quality. Retrieved from http://www.tqsource.org/link.php

Goe, L., Bell, C., & Little, O. (2008). *Approaches to evaluating teacher effectiveness: A research synthesis*. Washington, DC: National Comprehensive Center for Teacher Quality. Retrieved from http://www.tqsource.org/publications/teacherEffectiveness.php

Goldhaber, D. D. (2005). *Teacher licensure tests and student achievement: Is teacher testing an effective policy?* (CPRE Working Paper No. 2005-4). Seattle, WA: Center on Reinventing Public Education. Retrieved from http://www.crpe.org/cs/crpe/view/csr_pubs/151

Goldhaber, D. D., & Brewer, D. J. (1998). When should we reward degrees for teachers? *Phi Delta Kappan, 80,* 134-138.

Goldhaber, D. D., & Brewer, D. J. (2000). Does teacher certification matter? High school teacher certification status and student achievement. *Educational Evaluation and Policy Analysis, 22,* 129-146.

Goldhaber, D. D., & Brewer, D. J. (2001). Evaluating the evidence on teacher certification: A rejoinder. *Educational Evaluation & Policy Analysis, 23,* 79-86.

Gordon, R., Kane, T. J., & Staiger, D. O. (2006). *Identifying effective teachers using performance on the job* (Discussion Paper 2006-01). Washington, DC: The Brookings Institute. Retrieved from http://www.brookings.edu/~/media/Files/rc/papers/2006/04education_gordon/200604hamilton_1.pdf

Grantmakers for Education. (2009). *Benchmarking trends in education philanthropy 2009*. Portland, OR: Grantmakers for Education. Retrieved from http://edfunders.org/downloads/GFEReports/GFE_BENCHMARKING_2009.pdf

Greenwald, R. L., Hedges, V., & Laine, R. D. (1996). The effect of school resources on student achievement. *Review of Educational Research, 66,* 361-396.

Guarino, C. M., Santibanez, L., & Daley, G. A. (2006). Teacher recruitment and retention: A review of the recent empirical literature. *Review of Educational Research, 76,* 173-208.

Hallinger, P., & Heck, R. H. (1998). Exploring the principal's contribution to school effectiveness: 1980-1995. *School Effectiveness and School Improvement, 9,* 157-191.

Hanushek, E. A. (1992). The trade-off between child quantity and quality. *Journal of Political Economy, 100,* 85-117.

Hanushek, E. A. (2009). Teacher deselection. In D. Goldhaber & J. Hannaway (Eds.), *Creating a new teaching profession*. Washington, DC: Urban Institute Press. Retrieved from http://edpro.stanford.edu/hanushek/files_det.asp?FileId=258

Hanushek, E. A., Kain, J., & Rivkin, S. (2004). Why public schools lose teachers. *Journal of Human Resources, 39*, 326-354.

Hanushek, E. A., & Rivkin, S. (2007). Pay, working conditions and teaching quality. *The Future of Children, 17*(1), 69-86. Retrieved from http://www.futureofchildren.org/usr_doc/7_04.pdf

Harris, D. N., & Sass, T. R. (2007). *Teacher training, teacher quality, and student achievement* (Working Paper No. 3). Washington, DC: National Center for Analysis of Longitudinal Data in Education Research. Retrieved from http://www.caldercenter.org/PDF/1001059_Teacher_Training.pdf

Hiebert, J., & Grouws, D. A. (2007). The effects of classroom mathematics teaching on students' learning. In F. K. Lester (Ed.), *The second handbook of research in mathematics education*. Reston, VA: New Age and National Council of Teachers of Mathematics.

Hirsch, E. (2006). *Recruiting and retaining teachers in Alabama: Educators on what it will take to staff all classrooms with quality teachers*. Hillsborough, NC: Center for Teaching Quality. Retrieved from http://www.teachingquality.org/pdfs/al_recruitretain.pdf

Hirsch, E. (2008*). Key issue: Identifying professional contexts to support highly effective teachers*. Washington, DC: National Comprehensive Center for Teacher Quality. Retrieved from http://www2.tqsource.org/strategies/het/ProfessionalContexts.pdf

Hirsch, E., & Emerick, S. (with Church, K. & Fuller, E.). (2006). *Teaching and learning conditions are critical to the success of students and the retention of teachers: Final report on the 2006 teaching and learning conditions survey to the Clark County (NV) school district*. Hillsborough, NC: Center for Teaching Quality. Retrieved from http://www.teachingquality.org/legacy/twcccsd2006.pdf

Hirsch, E., Freitas, C., & Villar, A. (2008). *Interim report on teaching, learning and leadership survey outcomes (Kansas, Massachusetts, West Virginia)*. Santa Cruz, CA: New Teacher Center at the University of California Santa Cruz.

Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38,* 499-536.

Ingersoll, R. M. (2002). Holes in the teacher supply bucket. *The School Administrator, 59*(3), 42.

Ingersoll, R. M. (2003). *Is there really a teacher shortage?* (Document R-03-4). Seattle, WA: University of Washington, Center for the Study of Teaching and Policy. Retrieved from http://depts.washington.edu/ctpmail/PDFs/Shortage-RI-09-2003.pdf

Ingersoll, R. M., & Kralik, J. M. (2004). *The impact of mentoring on teacher retention: What the research says*. Denver, CO: Education Commission of the States. Retrieved from http://www.ecs.org/clearinghouse/50/36/5036.pdf

Ingersoll, R. M., & Smith, T. (2003). The wrong solution to the teacher shortage. *Educational Leadership, 60*(8), 30-33.

Isenberg, E., Glazerman, S., Bleeker, M., Johnson, A., Lugo-Gil, J., Grider, M., Dolfin, S., & Britton, E. (2009). *Impacts of comprehensive teacher induction: Results from the second year of a randomized controlled study — Executive Summary* (Publication No. NCEE 2009-4073). Washington, DC: Institute of Education Sciences. Retrieved from http://ies.ed.gov/pubsearch/pubsinfo.asp?pubid=NCEE20094072

Johnson, S. M., Berg, J. H., & Donaldson, M. L. (2005). *Who stays in teaching and why: A review of the literature on teacher retention*. Cambridge, MA: Harvard Graduate School of Education, The Project on the Next Generation of Teachers. Retrieved from: http://assets.aarp.org/www.aarp.org_/articles/NRTA/Harvard_report.pdf

Johnson, S. M., & Birkeland, S. (2003). Pursuing a "sense of success:" New teachers explain their career decisions. *American Educational Research Journal, 40,* 581-617.

Johnson, S. M., & The Project on the Next Generation of Teachers. (2004). *Finders and keepers: Helping new teachers survive and thrive in our schools*. San Francisco, CA: Jossey-Bass.

Kain, J. F. (1998, October). *The impact of individual teachers and peers on individual student achievement*. Paper presented at the Association for Public Policy Analysis and Management 20th Annual Research Conference, New York.

Kane, T. J., Rockoff, J. E., & Staiger, D. O. (2006). *What does certification tell us about teacher effectiveness? Evidence from New York City* (Working Paper 12155). Cambridge, MA: National Bureau of Economic Research.

Kennedy, M. (1998). *Form and substance of inservice teacher education* (Research Monograph No. 13.) Madison, WI: National Institute for Science Education, University of Wisconsin–Madison.

Ladd, H. F. (2008). Teacher effects: What do we know? In G. Duncan & J. Spillane (Eds.), *Teacher quality: broadening and deepening the debate* (pp. 3-28). Evanston, IL: Northwestern University.

Lankford, H., Loeb, S., & Wyckoff, J. (2002). Teacher sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis, 24,* 37-62.

Leithwood, K., Louis, K. S., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning*. Chicago, IL: American Educational Research Association. Retrieved from http://www.wallacefoundation.org/SiteCollectionDocuments/WF/Knowledge%20Center/Attachments/PDF/ReviewofResearch-LearningFromLeadership.pdf

Levine, A. (2006). *Educating school teachers*. Washington, DC: The Education Schools Project. Retrieved from http://www.edschools.org/pdf/Educating_Teachers_Report.pdf

Lobman, C., & Ryan, S. (2006). *Carrots and sticks: New Jersey's effort to create a qualified pk-3 workforce* (Policy Brief No. 6). New York, NY: Foundation for Child Development. Retrieved from http://www.fcd-us.org/resources/resources_show.htm?doc_id=462367

Loeb, S., & Beteille, T. (2008). Teacher labor markets and teacher labor market research. In G. Duncan & J. Spillane (Eds.), *Teacher quality: Broadening and deepening the debate* (pp. 27-58). Evanston, IL: Northwestern University.

Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education, 80*(3), 44-77.

Loeb, S., & Page, M. (2000). Examining the link between teacher wages and student outcomes: The importance of alternative labor market opportunities and non-pecuniary variation. *Review of Economics and Statistics, 82,* 393-408.

Luekens, M. T., Lyter, D. M., Fox, E. E., & Chandler, K. (2004). *Teacher attrition and mobility: Results from the teacher follow-up survey, 2000-01*. Washington, DC: National Center for Education Statistics.

McCaffrey, J. R., Lockwood, D. F., Koretz, D. M., & Hamilton, L. S. (2003). *Evaluating value added models for teacher accountability* [Monograph]. Santa Monica, CA: RAND Corporation. Retrieved from http://www.rand.org/pubs/monographs/2004/RAND_MG158.pdf

McCartney, K. (2009, March13). Finally getting smart about investing in learning early [Editorial]. *The Boston Globe*. Retrieved from http://www.boston.com/bostonglobe/editorial_opinion/

McKinsey & Company. (2007). *How the world's best-performing school systems come out on top*. Washington, DC: McKinsey & Company. Retrieved from http://www.mckinsey.com/App_Media/Reports/SSO/Worlds_School_Systems_Final.pdf

Mendro, R., Jordan, H., Gomez, E., Anderson, M., & Bembry, K. (1998). *An application of multiple linear regression in determining longitudinal teacher effectiveness*. Paper presented at the 1998 Annual Meeting of the AERA, San Diego, CA.

Metlife, Inc. (2005). *The Metlife survey of the American teacher: Transitions and the role of supportive relationships: A survey of teachers, principals and students 2004-05*. New York, NY: Metlife, Inc.

Miller, J. W., McKenna, M. C., & McKenna, B. A. (1998). A comparison of alternatively and traditionally prepared teachers. *Journal of Teacher Education, 49*(3), 165-76.

Moir, E., Barlin, D., Gless, J., & Miles, J. (2010). *New teacher mentoring: Hopes and promise for improving teacher effectiveness*. Cambridge, MA: Harvard Education Press.

Murnane, R. J., Singer, J. D., Willett, J. B., Kemple, J. J., & Olsen, R. J. (1991). *Who will teach?: Policies that matter*. Cambridge, MA: Harvard University Press.

National Center for Education Statistics. (2007). *Teacher Follow-Up Survey (Questionnaire for Current Teachers and Questionnaire for Former Teachers), 2004-05*. Washington, DC: Government Printing Office.

National Research Council and National Academy of Education. (2010). *Getting value out of value-added: Report of a workshop*. Committee on Value-Added Methodology for Instructional Improvement, Program Evaluation, and Educational Accountability, H. Braun, N. Chudowsky, & J. Koenig (Eds.). Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press. Retrieved from http://books.nap.edu/catalog.php?record_id=12820

The New Teacher Project. (2007). *The widget effect: Hiring, assignment, and transfer in Chicago public schools*. Brooklyn, NY: The New Teacher Project.

The New Teacher Project, (2009). *The widget effect: Our national failure to acknowledge and act on differences in teacher effectiveness*. Brooklyn, NY: The New Teacher Project.

Nye, B.,Konstantopoulos, S., & Hedges, L. V. (2004). How large are teacher effects? *Educational Evaluation and Policy Analysis*, *26*(3), 237-257.

Peter D. Hart Research Associates, Inc. (2010). *Career changers in the classroom: A national portrait*. Washington, DC: Peter D. Hart Research Associates, Inc. Retrieved from http://www.woodrow.org/policy/current.php

Pianta, R. C., & Hadden, D. S. (2008). What we know about the quality of early childhood settings: Implications for research on teacher preparation and professional development. *The State Education Standard, 20-27.* Retrieved from http://nasbe.org/index.php/file-repository?func=fileinfo&id=762

Pianta, R. C., & Hamre, B. K. (2009). Conceptualization, measurement, and improvement of classroom processes: Standardized observation can leverage capacity. *Educational Researcher, 38,* 109-119.

Podgursky, M., Monroe, R., & Watson, D. (2004). The academic quality of public school teachers: An analysis of entry and exit behavior. *Economics of Education Review, 23,* 507-518.

Portin, B. S., Knapp, M. S., Feldman, S., Russell, F. A., Samuelson, C., & Yeh, T. L. (with Gallucii, C. & Swanson, J.). (2009). *Leadership for improvement in urban schools*. Seattle, WA: University of Washington, Center for the Study of Teaching and Policy. Retrieved from http://depts.washington.edu/ctpmail/PDFs/S1-SchoolLeadership-10-2009.pdf

Presley, J., White, B., & Gong, Y. (2005). *Examining the distribution and impact of teacher quality in Illinois* (Policy Research Report IERC 2005-2). Chicago, IL: Illinois Education Research Council.

Ravitch, D. (2010). *The death and life of the great American school system: How testing and choice are undermining education*. New York, NY: Basic Books.

Rice, J. K. (2003). *Teacher quality: Understanding the effectiveness of teacher attributes*. Washington, DC: Economic Policy Institute.

Richardson, V., & Placier, P. (2001). Teacher change. In V. Richardson (Ed.), *Handbook of Research on Teaching* (4th Ed., pp. 905–947) Washington, DC: American Education Research Association.

Rivers, J. C. (1999). *The impact of teacher effect on student math competency achievement* (Doctoral dissertation, University of Tennessee, Knoxville).

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic achievement. *Econometrics, 73,* 417-458. Retrieved from http://edpro.stanford.edu/Hanushek/files_det.asp?FileId=73

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2000). *Teachers, schools, and academic achievement* (Working Paper W6691). Cambridge, MA: National Bureau of Economic Research.

Rockoff, J. E. (2004). The impact of individual teachers on student achievement: Evidence from panel data. *American Economic Review, 94*(2), 247-252.

Rockoff, J. E., Jacob, B. A., Kane, T. J., & Staiger, D. O. (2008). *Can you recognize an effective teacher when you recruit one?* (NBER Working Paper No. 14485). Cambridge, MA: National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w14485

Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach* (7th Ed.) Thousand Oaks, CA: Sage Publications.

Rotherham, A. (2008). *Achieving teacher and principal excellence: A guidebook for donors*. Washington, DC: Philanthropy Roundtable. Retrieved from http://www.philanthropyroundtable.org/files/TeacherExcellence.pdf

Rowan, B., Correnti, R., & Miller, R. J. (2002). What large-scale survey research tells us about teacher effects on student achievement: Insights from the Prospects study of elementary schools. *Teachers College Record, 104,* 1525-1567.

Roza, M., & Miller, R. (2009). *Separation of degrees: State-by-state analysis of teacher compensation for master's degrees*. Seattle, WA: Center on Reinventing Public Education. Retrieved from http://www.crpe.org/cs/crpe/view/csr_pubs/289

Sadowski, M. (2006). *Core knowledge for PK-3 teaching: Ten components of effective instruction* (Policy Brief No. 5). New York, NY: Foundation for Child Development. Retrieved from http://www.fcd-us.org/resources/resources_show.htm?doc_id=462123

Sanders, W., & Rivers, J. C. (1996). *Cumulative and residual effects of teachers on future student academic achievement*. Knoxville, TN: University of Tennessee Value-Added Research Center.

Sanders, W., Saracho, O. N., & Spodek, B. (2007) Early childhood teachers' preparation and the quality of program outcomes. *Early Child Development and Care, 177,* 71-91.

Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (1993). *Significant benefits: The HighScope Perry Preschool study through age 27* (Monographs of the HighScope Educational Research Foundation, 10). Ypsilanti, MI: HighScope Press.

Spillane, J. P., Halverson, R., & Diamond, J. B. (2001). Investigating school leadership practice: A distributed perspective. *Educational Researcher, 30*(3), 23-28.

Sprinthall, N. A., Reiman, A. J., & Thies-Sprinthall, L. (1996). Teacher professional development. In J. Sikula (Ed.), *Handbook of research on teacher education* (2nd Ed., pp. 666–703). New York, NY: Macmillan.

Stafford, D., & Barrow, G. (1994). Houston's alternative certification program. *Educational Forum, 58*, 193-198.

Talbert, J. E., & McLaughlin, M. W. (1993). Understanding teaching in context. In D. K. Cohen, M. W. Mclaughlin, & J. E. Talbert (Eds.), *Teaching for understanding: Challenges for policy and practice* (pp. 167-206). San Francisco, CA: Jossey-Bass Inc.

T.E.A.C.H. Early Childhood Project. (2009). *Creating systems of support for the early childhood workforce: The T.E.A.C.H. early childhood & child care WAGE$ national annual program report 2008-2009*. Chapel Hill, NC: Child Care Services Association. Retrieved from http://www.childcareservices .org/_downloads/TEACH_AnnualReport_09.pdf.

Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research, 73,* 89-122.

Whitebook, M. (2003). *Early education quality: higher teacher qualifications for better learning environments—a review of the literature*. Berkeley, CA: University of California, Berkeley, Center for the Study of Child Care Employment. Retrieved from http://www.irle.berkeley.edu/cscce/archives.html

Wilson, S. (Ed). (2009). *Teacher quality* (Education Policy White Paper). Washington, DC: National Academy of Education. Retrieved from http://www.naeducation.org/Teacher_Quality_White_Paper.pdf

Wright, S. P., Horn, S. P., & Sanders, W. L. (1997). Teachers and classroom context effects on student achievement: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education, 11*, 57-67.

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (Issues & Answers Report, REL 2007–No. 033). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. Retrieved from http://ies.ed.gov/ncee/edlabs

Zeichner, K. M., & Conklin, H. G. (2005). Teacher education programs. In M. Cochran-Smith & K. M. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education* (pp. 645-736). Mahwah, NJ: Lawrence Erlbaum Associates.

Appendix: Profiled Strategies

Strategies that Focus on Teacher Preparation

Alverno College

Focus: Teacher training, preservice

Description: An exemplar of a traditional four-year teacher preparation program focused on graduating students who are ready to step into their own classrooms and teach to the highest standard.

Primary Funding: As this is a traditional college, funding comes from the college's endowment, contributions, and tuition.

Evidence Base: Research conducted by Arthur Levine points to the effectiveness of the streamlined content and pedagogical coursework of Alverno College students, as well as for the graduated and continuing field experiences teaching candidates must complete.

URL:
www.alverno.edu/academics/secondary_education.html

Urban Residency Programs

Focus: Alternative preservice and induction

Description: Residency teaching candidates are selected to train in cohorts, are paired with experienced teacher-mentors, and spend a full year in a classroom practicum that parallels their master's level coursework in education.

Primary Funding: Federally funded grants through the U.S. Department of Education and non-profit support.

Evidence Base: Urban residency teachers are have been found to stay in the profession longer; are more likely to stay in urban, high-needs communities; and enter the classroom better prepared to improve student learning.

URL:
www.utrunited.org/

Teacher U

Focus: Alternative preservice

Description: Two-year preservice training for new transitionally certified teachers in New York alternative schools.

Primary Funding: This is a nonprofit organization. Likely a hybrid of participant fees and contributions by supporting sponsors.

Evidence Base: Clinical coursework and on-the-job training. Identified as promising approach by the Center for High Impact Philanthropy.

URL:
www.teacheru.org/

Abbott Preschool Program

Focus: Training, professional development, incentives

Description: Mandated highly qualified teaching in urban preschool classrooms in 31 of New Jersey's poorest school districts. Teachers receive scholarships to complete higher-level coursework and must attain certain minimum degree levels to stay in the classroom.

Primary Funding: The state of New Jersey funds these scholarships in partnership with the child-care centers in which the teachers work and the institutions of higher education in the form of tuition remittance.

Evidence Base: Research has demonstrated that children whose teachers have a minimum of a B.A. and/or specialized training in early-childhood education perform better in literacy and mathematical concepts and are less likely to be held back in the early elementary school years.

URL:
www.state.nj.us/education/archive/abbotts/

Strategies to Influence the Human Capital Pool

Houston's ASPIRE and Denver's ProComp Models

Focus: Pay, evaluation

Description: Using differentiated pay scales based on school and teacher evaluation to determine compensation and bonuses.

Primary Funding: Federal Teacher Incentive Fund grants, supplemented by district funds**.**

Evidence Base: These districts have seen increased teacher retention and recruitment. Little research has been done, and few have been able to link directly to effects on student performance.

URLs:
denverprocomp.dpsk12.org/about/overview

portal.battelleforkids.org/ASPIRE

TEACH Early Childhood Project

Focus: Incentive, pay, higher teacher qualifications

Description: Child Care Services Association's scholarship and salary incentive program to create a higher-quality, better-compensated, early-childhood workforce, now in 21 states.

Primary Funding: Funding comes from a combination of early-childhood education centers and foundations, the United Way, corporations, the federal Child Care and Development Block Grant, and states' General Assemblies.

Evidence Base: Higher educational attainment and higher levels of teacher compensation are identified as promising practices by Pre-K Now, a program of the Pew Center on the States.

URL:
www.childcareservices.org/ps/teach.html

Teacher Advancement Program (TAP)

Focus: Evaluation, pay, professional development, developing multiple career paths

Description: A teacher-quality-improvement program that evaluates teachers multiple times during a year and allows teachers to take on different teaching positions, receive financial compensation based on their instructional quality and performance of their students, and provides them with access to more experienced teachers.

Primary Funding: TAP schools are supported by a variety of funding sources, including private foundation grants; legislative appropriations; property-tax levies; sales tax increases; and general revenues from state budgets, district funds, and federal dollars available through the Elementary and Secondary Education Act and the Teacher Incentive Fund (TIF).

Evidence Base: In 2009, Mathematica, an evaluation firm, studied the effectiveness of TAP on improving student achievement and teacher retention in participating Chicago schools. The results showed that TAP was ineffective on improving these two measures after one year's worth of implementation.

URL:
www.tapsystem.org/

Quality for ME

Focus: Teacher evaluation

Description: Set of criteria which Maine uses to measure early-childhood teacher and program quality. Identifies teachers going above and beyond state standards, as well as those who could use additional supports and training.

Primary Funding: Child Care Development Fund of the U.S. Department of Health and Human Services.

Evidence Base: Findings from the National Center for Research on Early Childhood Education suggest that quality rating and improvement systems provide useful mechanisms for defining the optimal conditions for teaching and preparing young children for school.

URLs:
www.nccic.acf.hhs.gov/pubs/qrs-defsystems.html

www.maine.gov/dhhs/ocfs/ec/occhs/qualityforme.htm

The New Teacher Center's (NTC's) New Teacher Mentoring Program

Focus: Professional development, induction

Description: Districts across the country team with NTC to provide support to new teacher-mentors.

Primary Funding: Unclear. Program appears to be fee-based, and most likely funding comes from state and district professional development allocations.

Evidence Base: Mentor induction has been shown to increase retention of new teachers and is believed to have positive impact on student outcomes, but research has not identified a direct link to student learning.

URL:
www.newteachercenter.org/ti/menu.php?p=pd

My Teaching Partner

Focus: Professional development

Description: An online, video-based professional development system for early-childhood teachers run through the Curry School of Education at the University of Virginia.

Primary Funding: Supported by the Institute of Education Science, U.S. Department of Education through Grant R305A07068 to the University of Virginia.

Evidence Base: While little research has been done on the importance or impact of professional development at the early-childhood level, Robert Pianta and his colleagues developed this system as an innovative spin-off of professional development at the K-12 level.

URL:
www.myteachingpartner.net/

Strategies that Focus on School Leadership and Working Conditions

New Leaders for New Schools

Focus: Professional development, induction

Description: The New Leaders program partners with 10 districts nationwide to recruit and train exceptional leaders to become outstanding principals in urban public schools.

Primary Funding: Various local, state, and federal funds, plus multiple foundation funders, including the Bill & Melinda Gates Foundation, the Broad Foundation, the Carnegie Corporation of New York, the Hyde Family Foundations, the Michael and Susan Dell Foundation, the Noyce Foundation, and the Pearson Foundation.

Evidence Base: The RAND Corporation found students in elementary and middle schools led by New Teacher principals for at least three years have made academic performance gains faster than comparable students in their districts. In high schools led by New Teacher principals, students are graduating at higher rates than the district average. New Teacher-led schools have also been identified as the most improved or highest-performing schools city-wide in five cases and statewide in two cases.

URL:
www.nlns.org/

Leading Early Childhood Communities

Focus: Professional development for leaders

Description: Program is sponsored by the National Association for Elementary School Principals; it provides ongoing education for principals and center directors in practices conducive to supporting teachers and increasing positive student outcomes.

Primary Funding: The workshops must be purchased through the NAESP for any participating principals. The cost of workshop materials for roughly 10 participants is $550.

Evidence Base: It is unclear what specific research was used to develop the standards that form the foundation of the workshops and practices. NAESP mentions case studies as evidence that its approaches are beneficial.

URL:
www.naesp.org/Early_Childhood_After_School.aspx

The Benwood Initiative

Focus: Working conditions

Description: The Benwood Initiative is a reform initiative for elementary schools identified as low-performing in Chattanooga, Tenn.; the initiative uses a whole-school framework of making a more cohesive and effective working environment.

Primary Funding: Benwood Foundation and the Chattanooga-Hamilton County Public Education Foundation.

Evidence Base: Data collected by the Chattanooga-Hamilton County Public Education Foundation after the initiative was under way found decreased teacher attrition; higher teacher morale; and increased reading scores of students in grade 3 and math scores in grade 5 in Benwood schools. Identified as promising approach by the Center for High Impact Philanthropy.

URLs:
www.tennesseescore.org/index.cfm?Page=BenwoodInitiative

www.educationsector.org/usr_doc/thebenwoodplan.pdf

The Generation Schools Network

Focus: Working conditions

Description: The Generation Schools Network and the Brooklyn Generation School are based on the strategy of restructuring teachers' in-school time. Teachers instruct only three classes a day, get two hours of common planning with colleagues each afternoon, and have a greatly reduced student load—as few as 14 students per class. The school will serve students in grades 6-12 when fully scaled.

Primary Funding: The Generation Schools Network, through foundation grants, corporate donations, and individual charitable giving.

Evidence Base: Evidence demonstrates that when good teachers have more time with much smaller classes, students achieve. This model adheres to increased instruction time at current per-pupil-expenditure levels. Identified as a promising approach by the Center for High Impact Philanthropy.

URL:
www.generationschools.org/

EDITORIAL PROJECTS IN EDUCATION RESEARCH CENTER

The EPE Research Center

is the research arm of Editorial Projects in Education, which houses a full-time staff of researchers, analysts, and librarians that conducts annual policy surveys, collects data, and performs analyses that appear in the *Quality Counts* and *Diplomas Count* annual reports. The center also produces independent research reports, contributes original data and analysis to special coverage in *Education Week* and edweek.org, hosts live Web chats and Webinars on research topics, and maintains the Education Counts and EdWeek Maps online data resources.

Editorial Projects in Education (EPE)

is a nonprofit, tax-exempt organization based in Bethesda, Md. Its primary mission is to help raise the level of awareness and understanding among professionals and the public of important issues in American education. EPE covers local, state, national, and international news and issues from preschool through the 12th grade. Editorial Projects in Education publishes *Education Week*, America's newspaper of record for precollegiate education; *Digital Directions*; the *Teacher Professional Development Sourcebook*; and the Top-School-Jobs employment resource. It also produces periodic special reports on issues ranging from technology to textbooks, as well as books of special interest to educators through Education Week Press.

EPE RC RESEARCH CENTER