Teaching Quality

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Sean Kelly, Ben Pogodzinski, and Yuan Zhang

Abstract

Sociological research has often focused on teaching practices, and features of the teaching profession, in search of mechanisms that explain disparate schooling outcomes. Yet, the study of teachers and teaching practices is complicated by the fact that students' themselves influence classroom instruction. To what extent is systematic variation in teaching quality responsible for persistent and sometimes widening gaps in educational outcomes among social groups in the United States? The evidence summarized in this chapter reveals that most teachers in the United States are both well-qualified and skilled at increasing student achievement. This is true even in schools that serve students facing serious social problems associated with poverty. At the same time, close studies of the teaching process reveal room for improvement, and we conclude that raising the aggregate quality of teaching, and making sure that all students have access to high-quality instruction, will indeed help address persistent gaps in educational outcomes. To improve teaching quality, research, policy initiatives, and future investments must treat teachers' work as an integrated whole, supporting the professional socialization, ongoing development, and learning of teachers, and the organizational climate in which they work.

Popular conceptions of the teaching profession often depict the quality of instruction in teachers' classrooms as highly variable: An entire year's worth of learning experiences, perhaps even an entire educational career, are thought to hang in the balance each fall when classroom assignments are made. For example, blockbuster Hollywood teacher narratives, from *Up the Down Stair Case* (1967) to *Dangerous Minds* (1989) to *Freedom Writers* (2007), have long depicted the lone "teacher hero," struggling to make a difference amongst a sea of ineffectual colleagues (Kelly and Caughlan 2011; Bulman 2005). Is the quality of instruction in different classrooms really so widely disparate? And if so, what are the sources of this variation? To what extent does systematic variation in teaching quality explain persistent gaps in educational outcomes among social groups in the United States (see e.g., Reardon 2011 and chapter 3 in this handbook)? What essential principles should guide efforts to improve teaching quality?

To answer these questions, we begin by considering variability between poor and non-poor

S. Kelly (✉) · Y. Zhang
University of Pittsburgh, Pittsburgh, PA, USA
e-mail: spkelly@pitt.edu; yuz55@pitt.edu

B. Pogodzinski
Wayne State University, Detroit, MI, USA
e-mail: Ben.pogodzinski@wayne.edu

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schools in the teacher qualifications and background characteristics thought to produce high-quality instruction and student learning outcomes. Next, we review the literature examining the effect of basic teacher qualifications on student learning outcomes. We find that while access to qualified teachers is unevenly distributed across schools and student groups, most teachers in the United States are well-qualified, and existing variation in basic qualifications is not responsible to any great extent for high levels of educational inequality. In Sects. 12.2 and 12.3 we consider studies that focus on observed teaching practices and student learning outcomes associated with specific teachers. This "teacher effects" research shows both pronounced variability in teaching quality and that teachers' use of known best practices do correlate with improved student outcomes. However, as with research on teacher qualifications, these studies speak more to the possibilities for improving teaching quality—what we might hope to ultimately achieve from the right mix of educational reforms—than to shortcomings of the teaching workforce in low-SES schools. In Sect. 12.4 we discuss seminal studies of teaching in the sociology of education which demonstrate the difficulty and uncertainty of teaching and the impact of social context on teachers' work. Building on these insights, we conclude by discussing the school organizational supports that show the most promise in improving teaching quality.

Consistent with an emphasis on social context supports for teaching, throughout this chapter we employ the term *teaching* quality, rather than *teacher* quality, in order to emphasize that effective instruction is not primarily a product of immutable attributes that characterize individual teachers, but rather occurs at the intersection of the teacher, the classroom context, and the social and organizational supports that are in place. In addition, the term "teacher quality" seems to imply a stability in the quality and impact of instruction that is not always present (Darling-Hammond et al. 2012). However, we begin by reviewing research concerning teacher qualifications, as well as estimates of effectiveness associated with specific teachers because these studies are an important component of an overall understanding of teaching quality (see also Hamilton 2012 or Kennedy 2010 for discussions of this distinction in terminology).

12.1 Variation in Teacher Qualifications Between and Within Schools

One common explanation for educational inequality is that achievement gaps are produced by differences in access to highly-qualified teachers; some students, even entire schools, have well-trained, effective teachers, while other students and schools have poorly-qualified teachers. Potentially important teacher qualifications and background variables that might exist between students and schools include: the selectivity of the universities teachers attended, their measured test scores, graduate training and practice-teaching experiences, a priori motivations, personality traits, and experience. While it is not possible in large-scale research to fully measure all aspects of teacher qualifications and background that might be important to successful teaching, studies of the teacher labor market across schools and districts reveal an uneven distribution of several basic teacher characteristics.

At the national level, data from the federally-sponsored Schools and Staffing Survey (SASS) provide evidence on the qualifications of the teaching workforce. Table 12.1 provides estimates of differences across poor and non-poor schools in three qualifications, years of teaching experience, master's degree (or higher) attainment, and certification status, compiled from fives waves of SASS beginning with the 1987–1988 school year. Students who attend a high-poverty school are more likely to have a teacher with three years or less of experience, and less likely to have a teacher with a full state certification or an advanced degree. In earlier waves of SASS the reported results focused on teacher qualifications in urban schools, and disparities exist between urban and suburban schools as well, although the differences are less substantial in this case.

Table 12.1 Disparities in teacher qualifications among full-time public secondary school teachers: findings from five waves of the schools and staffing survey

	Three Years or less Teaching Experience		Regular (full) Certification		Degree Attained (MA or higher)	
	Low-poverty (0–25%)	High-poverty (76–100%)	Low-poverty (0–25%)	High-poverty (76–100%)	Low-poverty (0–25%)	High-poverty (76–100%)
2011–2012[a]	9.3%	13.9%	92.6%	87.8%	63.2%	53.6%
2007–2008[b]	15.3%	21.9%	88.8%	81.7%	59.9%	46.5%
1999–2000	15.3%	16.5%	90.8%	87.3%	52.0%	44.7%
	Low-poverty (0–5%)	High-poverty (40–100%)	Suburban	Urban	Suburban	Urban
1990–1991[c]	–	–	95.5%	94.6%	59.6%	56.2%
1987–1988	7.1%	12.2%	95.3%	91.8%	59.1%	57%

Note: This table relies primarily on results reported in official publications from the National Center for Education Statistics, and thus there are some differences in reporting categories, and which teachers are considered

[a]In 2011–2012, statistics are for both part- and full-time teachers, and include both primary and secondary school teachers. In addition, poverty categories used are 0–34% vs 75% or more. Certification statistics are from author's calculation. Other statistics are from Goldring et al. (2013)

[b]Statistics for 2007–2008 and 1999–2000 are reported in Aud et al. (2010)

[c]Certification statistics for 1987–1988 and 1990–1991 refer to within-field certification (i.e., specifically in the teacher's main assignment field). Comparison of teaching experience in 1987–1988 is for both primary and secondary school teachers. Statistics reported in Smith et al. (1994) and Lippman et al. (1996)

The nationally-representative data from SASS reveal a situation of uneven teacher qualifications across poor and non-poor schools (and relatedly in urban vs suburban schools, and in minority vs predominantly White schools). However, it is also true that most teachers are highly qualified even in poor schools. For example, in the most recent wave of the SASS data, almost 90% of teachers are fully certified even in schools with a high-poverty concentration (although they may be teaching out-of-field, see Hill and Stearns 2015). Importantly, states have raised certification requirements in recent decades; such that today's fully certified teacher is more highly trained than ever before (Darling-Hammond et al. 2009a, b). This phenomenon is partially reflected in the increasing percentage of teachers with advanced degrees in the most recent waves of SASS. Yet, SASS provides a limited portrait of school-to-school variation in teacher qualifications on a few rough indicators. Studies using state-level administrative data in some cases find starker differences than reported in SASS, and also help explain how labor-market sorting processes produce uneven access to highly qualified teachers.

Lankford et al. (2002) examined the uneven distribution of teachers across schools using a comprehensive database of teachers in New York State during the 1999–2000 school year. In some cases, comparisons among different types of schools revealed pronounced differences in teacher qualifications. For example, Lankford et al. found that the relative risk of having a teacher who failed the state's general knowledge exam was approximately 38% higher for the average poor student than the average non-poor student (a probability of .279 vs .202). Among the state's non-White students, the relative risk of having a teacher who failed the state exam was almost three times higher than among White students (a probability of .212 vs .071), while the risk of having a teacher with a bachelor's degree from a least competitive college (as measured by the Barron's ranking of selectivity) was more than twice as high for non-White students (a probability of .214 vs .102).

More recent data from New York show that teacher qualifications in high-poverty schools are improving (Lankford et al. 2014), but the findings from 1999–2000 continue to serve as an example of the kinds of disparities that can occur across school, district, and regional boundaries, and that have been found in other state data (Adamson and Darling-Hammond 2012; Clotfelter et al. 2005; Goldhaber et al. 2015; Schultz 2014). Indeed, gaps in teacher qualifications are likely to continue to exist, as long as high levels of school segregation, particularly segregation across district boundaries (Clotfelter 2004; Vigdor 2011), create incentives in the teacher labor market for the most highly qualified teachers to move to higher socioeconomic status schools, where they find more favorable behavioral climates and higher salaries (Kelly 2004; Guarino et al. 2006; Ingersoll 2001). For example, in the New York data, Lankford et al. (2002) found that when teachers moved from one district to another they moved to schools with 50% fewer poor students (19.2% on average in the receiving school vs 38.1% in the originating school), and enjoyed a non-trivial increase in salary and a decline in class size. Relatedly, school administrators in high-poverty, high-minority schools (as well as schools with a larger student body enrollment), report greater difficulty in filling vacant teaching positions (Malkus et al. 2015; Jacob 2007). When staffing difficulties do occur, some school administrators must reluctantly rely on long-term substitutes or less than fully qualified applicants to fill positions (Jacob 2007).

12.1.1 Variation in Teacher Qualifications Within Schools

In addition to the possibility of an uneven distribution of teachers across schools, within schools there is great potential for uneven access to teachers with expert qualifications (Kalogrides et al. 2013). In secondary schools in particular (middle and high schools), the curriculum differentiation of students into high- and low-track classrooms creates the potential for "teacher tracking." For example, in the ninth grade, teachers assigned to teach honors geometry may have, on average, more substantial mathematical content knowledge than teachers assigned to teach a 2-year Algebra 1 sequence starting in ninth grade. Indeed, studies of the allocation of teachers to tracked classrooms show that such differences are widespread (Kelly 2004; Raudenbush et al. 1992; Riehl and Sipple 1996; Talbert 1992). Talbert (1992) estimated that approximately 34% of teachers are assigned to teach predominately high-or-low track classrooms, while Kelly (2004) reported that over 90% of secondary schools engage in some amount of teacher tracking (where an imbalance in teaching assignments was found among sampled teachers). In addition to differences in rates of master's degree attainment and subject-matter coursework, Kelly found several potential indicators of greater motivation among teachers with high-track assignments, including higher rates of participation in professional organizations and lower earnings from part-time work outside of teaching. Finally, low-track teachers report lower levels of efficacy than high-track teachers, and relatedly, lower career satisfaction (see Kelly 2009 for a summary of this research).

Clotfelter et al. (2005) analyzed differences in exposure to experienced teachers among Black and White seventh grade students using administrative data from North Carolina, and found that a substantial proportion of the total gap occurs within schools. In the state as a whole, approximately 8.3% of White students are taught by a novice math teacher (with no prior experience), while 12.8% of Black students have a novice math teacher, a 54% difference. Approximately 1/4 of the total gap among all students in the entire state (which captures differences across districts and schools, as well as within schools) was due to differences between classrooms within the same school. Moreover, in some districts racial gaps in access to experienced teachers occurred almost entirely within schools. In the NC analysis, the total effect of gaps in teacher qualifications on educational inequality is likely small because the absolute rates on this indicator are low (most teachers are not novice teachers). However, the implication from the teacher track-

ing literature is that observable indicators of teacher qualifications between tracks probably underestimate the true differences between teachers because assignment to high-track classes serves as an informal career ladder for the most motivated teachers.

12.2 Teacher Qualifications and Student Outcomes

The research reviewed in Sect. 12.1 showed systematic variation in access to highly-qualified teachers, for example in poor students' access to experienced teachers, and in low-track students' access to teachers with the strongest subject-matter training. To what extent are basic teacher qualifications related to student learning outcomes? Answers to this question are important both for understanding how the gaps in Sect. 12.1 might translate into differences in opportunity to learn, but also in informing policy efforts to improve teaching quality. For example, if teacher experience is strongly related to achievement outcomes, then targeted efforts to recruit experienced teachers to teach in low-performing schools, along with a concerted effort to retain them, might be a particularly effective reform strategy.

Although the 1966 Coleman report is best known for its implications in the study of school effects, it was also one of the first large-scale studies to produce estimates of how teacher qualifications affect student achievement, controlling for the effects of student family background. Coleman and his research team considered a number of teacher variables including: years of experience, teachers' educational attainment, and teachers' tested vocabulary. These variables were aggregated to the school level, along with student background variables, such that differences in achievement across schools might be identified statistically, free from student background effects. The results showed that teacher characteristics were more strongly related to school-to-school variation in achievement than all other measured attributes of schools (e.g., per pupil expenditures, physical resources, curricular attributes), apart from the aggregate effects of student background. Yet, in terms of the total variability in student achievement, the effects of teacher variables were small in Coleman's Equality of Educational Opportunity (EEO) study data, explaining at most 1–2% of the total variance among White students for example. Jencks et al. (1972) and colleagues reanalyzed the EEO data, along with other large educational databases of the era, and described the effects of teacher characteristics as having "small and inconsistent effects" on achievement (p. 96).

Since the early work by Coleman, Jencks, and others, researchers have continued to study the effects of teacher qualifications for three reasons: First, improved data have shown more consistent effects of certain teacher variables; second, some qualifications can be directly improved through policy mechanisms; third, the talent and capacity of the teaching workforce is a prerequisite to engaging in school improvement efforts. Even if the direct effect of a given teacher attribute on student achievement growth is small, effective reform to improve teaching practices hinges on having adequate human and social (as well as material/financial) resources in the form of a well-trained teaching workforce (Gamoran et al. 2000).

Table 12.2 presents evidence on the relationship between four major qualifications and teacher quality as measured by student achievement outcomes. Each of the three studies in Table 12.2 used large-scale state administrative data to explore teacher effects in public schools. We showcase these findings from North Carolina, Texas, and Florida in Table form for two main reasons. First, the data used in each study are representative of all public school students in particular grades/subject areas, constituting especially substantial populations of learners. Second, while other studies are available that use high-quality state or national data sets to examine teacher qualifications (e.g., Darling-Hammond 2000; Jepsen 2005; Kane et al. 2008), the three studies in Table 12.2 are indicative of the kind of divergent findings on the relationship between teacher qualifications and student achievement outcomes found throughout the literature. Additional evidence, including major reviews of

Table 12.2 Divergent findings on the relationship between teacher characteristics and student achievement

Studies (Data source)	Subjects	Teacher qualifications			
		Education	Experience	Test scores	College selectivity
Clotfelter, Ladd, & Vigdor, 2007 (North Carolina)	Math	Negative	Positive	Positive	Null
	Reading	Negative	Positive	Positive	Null
Rivkin, Hanushek, & Kain, 2005 (Texas)	Math	Null	Null		
	Reading	Null	Null		
Harris & Sass 2011 (Florida)	Math	Positive	Positive		
	Reading	Negative	Positive		

the literature by Wayne and Youngs (2003) and Greenwald et al. (1996), is also considered.

Teachers vary in the educational degrees they obtain in subject-matter areas, as well as in pedagogy, leadership, educational psychology, and related educational studies, with formal training occurring both before and after they enter teaching. While some research has shown positive effects of degree attainment (Wilson et al. 2001), other studies find no significant impact (e.g., Adams 2012; Jepsen 2005). Indeed, as revealed in Table 12.2, some studies even show a *negative* impact of master's degree attainment (e.g., Clotfelter et al. 2007). One explanation for negative effects of degree attainment in some states is that pursuing a master's degree may be part of preparation for a future administrative position, or otherwise signal a de-prioritization of the teacher's current classroom teaching assignment (Ladd and Sorensen 2015). In synthesizing results from studies on teacher qualifications, Wayne and Youngs (2003) concluded that overall, positive relationships between teacher education and student achievement could only be detected in mathematics, and only for high school students, suggesting that teacher education is not one of the most consistent or strongest predictors across educational settings. In contrast, instead of emphasizing teachers' basic educational attainment, efforts to specifically measure teachers' pedagogical content knowledge (i.e., content knowledge for teaching certain subjects) have found effects on student outcomes net of other teacher variables (e.g., Hill et al. 2005). These results suggest that *rigorous* degree attainment is in fact likely to improve teacher effectiveness.

In addition to educational attainment, teacher experience in the classroom is another well-researched measure of teacher qualifications. Similar to the findings on teachers' educational attainment, the evidence concerning years of teaching experience is somewhat conflicting. In their review of the literature, Greenwald et al. (1996) present both positive and negative findings on teacher experience, with the effect size varying substantially across studies. Wayne and Youngs (2003) argue that across a given sample of teachers, "years of experience" captures multiple underlying processes beyond experience itself (e.g., hiring conditions in the job market when teachers entered the profession), which may account for the inconclusive findings in the research literature. However, studies have shown consistent evidence of a positive association between teaching experience and student achievement during the earliest years of the teaching career (e.g., Clotfelter et al. 2006; Clotfelter et al. 2007). Teachers do become more effective as they accumulate real-world teaching experience in the first few years (see also Sect. 12.5 or more specifically Sect. 12.5.1 below).

Measures of teacher selectivity, including test scores on licensure exams, as well as the selectivity of the teachers' undergraduate institution, are generally positively related to student achievement outcomes (Wayne and Youngs 2003). Teachers' tested achievement may be particularly important in mathematics (Clotfelter et al. 2006; Kukla-Acevedo 2009). For example, estimates from Clotfelter et al. (2007) suggest that teachers with mathematics test scores two or more standard deviations above the average (as might be found among STEM-focused graduates from top universities) could increase student gains on mathematics tests by 0.068 of a standard deviation, while teachers who scored two or more stan-

dard deviations below the average would reduce student gains by 0.062 standard deviations, an overall difference of 0.130 standard deviations. While such an effect size is non-trivial and important, given the sheer size of the teaching workforce, we are unlikely to realize such gains on a large scale. Moreover, as is evinced in Table 12.2, even these teacher qualifications have null effects on achievement in some cases (e.g., the effect of college selectivity in the NC data).

An additional factor not shown in Table 12.2 but relevant to state policy decisions is the effect of teacher certification, including the prestigious National Board for Professional Teaching Standards (NBPTS) certification. As of 2011–2012, less than half of secondary school teachers held both a subject-matter major and full state certification in their main teaching assignment (Baldi et al. 2015; Hill and Stearns 2015). Although requirements for certification vary across states, by 2012, many states required substantial formal coursework in the subject matter taught, evidence of mastery of basic skills and subject-specific knowledge on written tests, and 10 or more weeks of student teaching experience (Quality Counts 2012). Overall, the effects of teacher certification appear to be important. For instance, state-certified mathematics teachers in North Carolina have mathematics achievement gains that are 0.03 to 0.06 standard deviations higher than teachers on provisional/emergency certification, while NBPTS certified teachers show gains 0.02 to 0.06 standard deviations higher than remaining teachers (Clotfelter et al. 2007). Currently however, NBPTS certification remains a rare and prestigious accomplishment; as of 2015, only 40,033 teachers nationwide were NBPTS certified (Quality Counts 2015).

Considering the findings in Sect. 12.1 and 12.2 on the distribution of teacher qualifications and their effects on student outcomes, uneven access to high-quality teachers does not appear to be the main driver of educational inequality in the U.S. There is, on balance, evidence that teacher preparation, experience, and selectivity are related to teacher effectiveness, *but the lack of consistency across studies and the modest effect sizes mean that observed teacher characteristics seldom explain much of the variation in student achievement* (Aaronson et al. 2007; Hanushek and Rivkin 2004; Konstantopoulos 2012; Rivkin et al. 2005). When comparing a teacher with a set of very weak credentials to very strong credentials, the effect on student achievement growth can be quite large relative to established reform benchmarks (Clotfelter et al. 2007), but such comparisons apply to relatively small percentages of students. Thus, considering specific student groups including poor vs non-poor students, or White vs non-White students, gaps in basic teacher qualifications among student groups appear to be only minimally responsible for disparate learning rates among those students (see e.g., Desimone and Long 2010; Guarino et al. 2006). One implication from existing literature then might be that in school improvement efforts focus should be shifted from teacher characteristics to observed teacher behaviors and student outcomes (Gamoran 2012; Kane and Staiger 2012). For example, teacher staffing reforms that use student test scores and other measures to identify the most effective teachers, and then provide these effective teachers with incentives to teach in low-performing schools, might be a promising reform strategy. We consider literature that speaks to teacher-to-teacher variability in observed practices and student outcomes in the next section.

12.3 Teacher-to-Teacher Differences in Instructional Practice and Student Achievement Growth

Studies of teaching quality that link student achievement growth to specific teachers (i.e., "teacher effects" research), consistently reveals significant variability in teacher effects on student achievement outcomes (Sanders and Horn 1998). Early efforts to quantify teacher effects were confounded by the non-random assignment of students to teachers; the teachers that appear most effective may just be the teachers who happened to be assigned the most effortful students. Studies in which students have been randomly assigned to teachers have overcome this

challenge, providing an especially robust portrait of teacher effectiveness. Project STAR (Student–Teacher Achievement Ratio) was a randomized experiment commissioned in 1985 by the Tennessee state legislature. The experiment sites included 79 elementary schools in 42 school districts, where kindergarten students were randomly assigned into small classes (13–17 students), large classes (22–26 students), or large classes with a full-time classroom aide; teachers were also randomly assigned to classes. The random assignments of students and teachers were maintained through the third grade (Nye et al. 2000). While the original goal was to shed light on the possible effect of class-size reduction policies, educational researchers realized that the STAR data addressed an even more fundamental educational question—just how strong an impact on achievement does an especially effective teacher have? Although not nationally representative, the overall design and quality of the data collection have made STAR "one of the great experiments in education in U.S. history" (Mosteller et al. 1996, p. 814).

Konstantopoulos and colleagues have used data from Project STAR and its follow-up study, the Lasting Benefits Study, to investigate the size and persistence of teacher effects from kindergarten through sixth grade. For example, Konstantopoulos and Chung (2011) used advanced statistical models to estimate teacher effects in grades K-6 for mathematics, reading, and science. Konstantopoulos and Chung found that students who had a highly effective teacher in fifth grade increased their achievement in mathematics by more than one quarter of a standard deviation in sixth grade; the results for reading and science were comparable. In addition, the findings indicate that kindergarten teacher effects persisted; students who had an effective teacher in kindergarten were still benefiting through sixth grade, although less so than from exposure to effective teachers in, say, fourth or fifth grade (see also Sanders and Horn 1998). Teacher effectiveness also appears to be cumulative. Konstantopoulos (2011) found that students assigned to teachers ranked at the 85th percentile of the teacher effectiveness distribution for three consecutive grades (from kindergarten through second grade) experienced an achievement increase of about one-third of a standard deviation in reading. Such effects are substantial and represent nearly one-third of a year's growth in achievement (see for example the discussion of empirical benchmarks for interpreting effect sizes in Hill et al. 2008). In addition to demonstrating the considerable magnitude and persistence of teacher effects, other Project STAR studies show that students, regardless of their race/ethnic or socioeconomic background characteristics, benefit from having effective teachers (Konstantopoulos 2009; Konstantopoulos and Chung 2011; Konstantopoulos and Sun 2012). For additional research on the variability and durability of teacher effects see Fan and Bains (2008) and Stigler and Hiebert (1999).

The Measures of Effective Teaching (MET) project was another large-scale experimental study that provided insight into teachers' impact on student achievement outcomes. During Year 1 (2009–2010), teachers' impact on student achievement growth was assessed using statistical controls for prior achievement; during Year 2 (2010–2011), teachers signed up as groups of three or more colleagues working in the same school and were randomly assigned to students in their grades and subjects. Researchers then studied the differences in student achievement gains within each of the Year 2 groupings to see if the students assigned to the teachers identified as "more effective" in Year 1 actually outperformed the students assigned to the "less effective" teachers. In addition to estimating teachers' impact on student achievement, the MET project observed and video-taped classroom sessions, such that the quality of teachers' instruction could be directly assessed using generic frameworks for the evaluation of effective teaching (e.g., CLASS, PLATO, FFT). Student and teacher surveys of instructional practice, as well as tests of teachers' pedagogical content knowledge, were also administered for the MET project. One aim of the project was an applied research goal, to provide information on how educational professionals might simultaneously draw on multiple measures in assessing teachers' work (e.g., for accountability purposes).

As with Project STAR though, the design and high quality of the measures in the MET study gave educational researchers new insight into basic teacher-to-teacher differences in classroom processes and outcomes.

Findings from MET confirm that some teachers are more effective at raising student achievement than others; the differences in learning between students assigned to teachers from the top quartile (top 25%) on the effectiveness distribution and students assigned to teachers from the bottom quartile ranged from 2.8 months (estimates based on state ELA test) to 10.8 months (estimates based on SAT9/Open-Ended Reading) (Bill and Melinda Gates Foundation 2010). Moreover, while there was not complete overlap, the most effective teachers also scored well on observations of best practices (Kane et al. 2013; Mihaly et al. 2013). For example, correlations between teacher scores on the Framework for Teaching (Danielson 2011) classroom observational protocol scores and the state value-added achievement measures ranged from .17 to .41 depending on the grade level and subject matter (see Mihaly et al. 2013, Table 3). Schacter and Thum (2004) provide additional evidence on the relationship between the quality of observed instruction and student achievement growth; in data from five elementary schools in Arizona, teachers who scored high on 12 research-based teaching performance standards produced about one full standard deviation gain above lower-scoring teachers.

12.3.1 Teacher Effectiveness Across Domains and Over Time

While the MET study was successful in confirming the variability in teacher effectiveness found in prior research, and in showcasing the relationship between high-quality instruction and student outcomes, other research raises questions about the generalizability of teacher effects to other important student outcomes and about the stability of teacher effectiveness over time (see Rothstein and Mathis 2013 for a critical review of the MET findings in particular and their application to teacher evaluation and other policy decisions).

Jennifer Jennings and colleagues have examined teacher-to-teacher variability in effectiveness as measured by specific, alternative student outcomes, which reinforces a multidimensional definition of high-quality teaching and shows that individual teachers may be more competent or focused on some dimensions than others. In the Early Childhood Longitudinal Study data, elementary school teachers who are effective at raising achievement in mathematics also tend to be effective at raising reading scores; correlations on reading and math gains ranged from .42–.48 (Jennings and Diprete 2010). In contrast, many teachers who were generally strong at promoting academic achievement had more difficulty cultivating desirable "approaches to learning" in students, the learning behaviors like task persistence, attentiveness, etc. that predict school success over the long-run (correlations between academic and behavioral outcomes ranged from .13 to .17).

Similar findings arose in the MET data; teacher effectiveness seemed to generalize, at least moderately so, across subject-matter tests with differing items and learning domains, and to student enjoyment of class, but not to other important motivation and engagement outcomes (Kane et al. 2013). In a study of mathematics learning and instruction in four districts, Blazer et al. 2016 found a significant relationship on average between value-added effectiveness ratings and observational measures of high-quality instruction, but the relationship was much stronger in some districts than in others. It can be difficult to predict, on the basis of a single measure, how effective any given teacher might be on a different measure or broader domain (see also Berliner 1976; Chaplin et al. 2014; Jennings and Corcoran 2012; Strunk et al. 2014).

An additional concern is the stability or consistency of teacher effects over time and/or with a different set of students. Early studies primarily focused on the stability of teacher effects across instructional periods during a single school year, finding relatively low stability of teacher effects from class to class (Rosenshine 1970; Emmer

et al. 1979). The increasing policy emphasis on teacher accountability in the 2000s has generated renewed interest in investigating the stability of teacher effectiveness. In a study of teacher performance rankings, Darling-Hammond et al. (2012) report that nearly 50% of the teachers changed rankings by at least two deciles from one year to the next. Other research confirms that, overall, teachers frequently move between adjacent performance rankings from year-to-year (e.g., second-quintile to median), but that teachers in the top- and bottom-performing categories often exhibit higher levels of stability (Aaronson et al. 2007; Ballou 2005; Goldhaber and Hanson 2010; Koedel and Betts 2007). In the MET data, the state value-added achievement measures had reliabilities (factoring in both the aggregation error and section-to-section stability) ranging from .32 in elementary English and language arts to .85 in middle school mathematics (Mihaly et al. 2013).

12.3.2 Implications of Teacher Effects Research

Despite the multidimensional nature of high-quality teaching and the difficulty of measuring instruction and student outcomes, the teacher effects research discussed in this section shows substantial variability in teaching quality. In addition, studies that include well-developed measures of teaching practice as well as student achievement growth find a correspondence between process and outcomes. More so than the research on teacher qualifications alone then, teacher effects studies suggest the possibility of a substantially uneven distribution of access to high-quality instruction.

However, it is important to stress that even if teacher effectiveness was highly stable and generalized to multiple domains, much of the variability in teacher effectiveness found in the studies discussed here occurs *within* schools and across rather than between student groups. In other words, it's not clear that large proportions of students are consistently exposed to ineffective teachers. Indeed, a long history of school effects research suggests that it is rare for entire schools to have a uniformly high or low level of teaching effectiveness of the magnitude used to illustrate variation in the studies above (Coleman et al. 1966; Scheerens and Bosker 1997). Even many high-poverty, chronically low-performing schools have admirable rates of achievement growth during the school year comparable to low-poverty schools (Entwisle et al. 1997; Downey et al. 2008). Unequal access to highly effective teachers is surely one source of educational inequality (see e.g., Isenberg et al. 2013; Sass et al. 2010), but the large and persistent educational gaps in the U.S. (and elsewhere) cannot be easily explained by any one factor. Rather, educational inequality is the result of a complex set of interrelated social conditions in families, schools, neighborhoods, and society at large (see Chap. 2).

Nevertheless, future research in the teacher effects tradition might inform our understanding of educational inequality and prospects for reform in (at least) two ways. First, studies should be designed to develop understandings of the systematic gaps in teaching quality that *do* exist between schools and social groups. Such studies will be most useful when they identify specific elements of instruction and teacher capacity for improvement. Hill and Lubienski's (2007) study identifying limitations in teachers' mathematical knowledge for teaching in urban schools is an example of such a study. Second, research on teacher effectiveness can speak to the possible effects of instructional improvement efforts by studying change in effectiveness within the same teachers over time. For example, what conditions of teacher training and support allow beginning teachers to make the most progress in challenging educational contexts? What conditions renew experienced teachers' motivation and effort?

12.4 The Influence of Social and Organizational Contexts on Teaching Quality

The work of teachers is complex and is heavily influenced by aspects of the profession itself, as well as social and organizational features of the school environment. Moreover, aspects of the profession interact with the school environment to influence norms and expectations for teachers' work. Teachers' work is highly regulated and standardized in many respects, but this does not eliminate the fundamental complexity of teaching. For example, teacher certification and licensure requirements structure entry into the profession and increasingly curricular choices have been removed from teachers in part as a response to increased school accountability pressures (Wills and Sandholtz 2009). At the same time, a myriad of decisions about the teaching and learning process at the classroom level remain, and consistent achievement growth for all students is often elusive.

One of the most important early works to further our understanding of the social and organizational contexts affecting teachers' work was Dan Lortie's (1975) *School Teacher*. In teaching, or indeed in most complex and difficult career endeavors, success hinges on having the personal skill and psychological resources to excel in uncertain or changing environments. The sociological analysis in *School Teacher* revealed the fragile nature of teachers' motivation and commitment, and the extent to which fundamental elements of the profession itself and the organization of schools shape teachers' work.

For his study, Lortie interviewed 94 teachers in 5 New England Towns in the summer of 1963, and relied on survey data from thousands of teachers in Dade County Florida in 1964. At that time, Lortie noted several structural features of the profession that make it different from medicine, law, engineering, and other professions. The large size of the teaching workforce, low pay, and other recruitment forces mean that the teaching profession has difficulty recruiting the most selective college graduates or attaining the prestige of other professions. These recruitment features are important, but Lortie argued that the most salient forces affecting teachers' work are two other structural aspects of the profession. First, compared to other professions, Lortie showed that teachers experience relatively weak professional socialization. Although teachers receive special schooling and a program of practice teaching, these experiences are often not robust enough to fully support the difficult work of teaching. As a result, many teachers lack the kind of "reassurance capital" that is found in other professions. Whereas a doctor is daily reassured that they are capable by having survived the arduous experience of medical school and residency, many teachers are left with a more personal burden of success or failure.

Second, Lortie emphasized that teaching is a mostly "unstaged" career. The pay-scale in teaching is front-loaded; pay does not rise dramatically over the course of a teacher's career. Nor does the nature of teacher's work itself change dramatically, the veteran teacher engages in much the same day-to-day tasks as the beginning teacher. In contrast, other professions are marked by career ladders with more sharply rising pay, and greater opportunity for transition to more complex tasks and supervisory roles. This structural feature has a profound effect on teachers. Staged careers produce cycles of effort, attainment, and renewed ambition. Teachers are left without the career staging that signals success. They are thus left to define success on their own terms, and to find renewed ambition in their interpersonal work with students.

The overall portrait of teachers' work that emerged for Lortie was one of "endemic uncertainty." Teachers are charged with diffuse and difficult goals, to not only promote achievement growth on tests, but ideally, to instill students with a love of learning, to not only be expert in the pedagogy of their subject matter, but to relate well to students. Moreover, they must accomplish all this in the turbulent social setting of a school full of developing, some might say, not yet

"wholly-formed," persons. The teachers Lortie interviewed expressed a great deal of uncertainty about how best to accomplish all of this or even to know when they have been successful. Teaching is difficult and uncertain work, and features of the profession itself, quite apart from the inherent proficiency of any given teacher, exacerbate these challenges.

However, there was also a silver-lining in *School Teacher*. Due to the lack of career-staging, to recruitment forces, and to the interpersonal nature of the work itself, many teachers Lortie interviewed were heavily focused precisely on the work rewards that were within their grasp, the psychic rewards that stem from reaching students:

> It is of great importance to teachers to feel that they have "reached" their students…We would therefore expect that much of a teachers' work motivation will rotate around the conduct of daily tasks—the actual instruction of students. In that regard, exertion of effort and the earning of important rewards are congruent; they are not in the position of those who must trade away psychic rewards in order to make a living.

The overall portrait of the teaching profession and the preoccupations, beliefs, and preferences of teachers in *School Teacher* has had an enduring effect on the study of teaching and remains relevant to contemporary efforts to reform the profession. For example, contemporary pay-for-performance reforms (Yuan et al. 2013) are precisely an effort to address the structural features outlined by Lortie. Yet, an important unit of analysis is unseen in *School Teacher*, the school itself as an organizational context that constrains or supports teachers' work. Subsequent research by Dworkin (1987, 2009), Rosenholtz (1989), Ingersoll (2003) and others examines school-building differences in the context of teachers' work.

It is critical to consider how the social and organizational context (e.g., levels of *relational trust* and *collective responsibility* amongst teachers and between teachers and administrators) influences the work of teachers (Bryk and Schneider 2002). Aspects of a school's formal and informal organization shape the norms and expectations for teachers' work, and affect the level of resources and support that teachers have access to within their school communities (Coburn and Russell 2008). Therefore, to understand and improve the work of teachers, continued attention should be given to the relationships among individuals within a school (Kardos et al. 2001; Penuel et al. 2010).

Susan Rosenholtz's (1989) study of 78 elementary schools in Tennessee was a landmark study in demonstrating how the organizational context of schools affects teachers' work. Rosenholtz identified a variety of important school organizational features which shaped teachers' work experiences including: the extent to which teachers (and the principal) shared common goals, the extent of teacher collaboration, teacher learning opportunities, participation in school-wide decision-making, task autonomy and discretion, evaluation practices and positive feedback, and school behavioral climate. Her work identified important links between organizational variables and teacher outcomes related to efficacy (labeled certainty in her analysis) and commitment. For example, Rosenholtz and colleagues found that about 76% of the teacher-to-teacher differences in commitment they observed could be traced to three organizational factors: task autonomy and discretion, positive feedback and evaluative practices, and the provision of teacher learning opportunities. Committed faculty respond affirmatively to question like, "In general, I really enjoy my students" while uncommitted faculty are prone to feelings like "By the middle of the day, I can't wait for my students to go home." An especially salient outcome related to low levels of commitment was the negative effect it had on constructive efforts to improve their teaching. In schools marked with high levels of teacher commitment, 73% of teachers had specific plans for new academic activities or content, while in schools with low levels of teacher commitment only 4% of teachers had academic plans.

More recent work has focused on the role that relational trust and collective responsibility have in shaping the work of teachers (e.g., Bryk and Schneider 2002; Bryk et al. 2010). For example, Bryk and Schneider (2002) defined relational trust

as encompassing four elements: (a) respect, (b) competence, (c) personal regard for others, and (d) integrity. Relational trust among teachers and between teachers and administrators is hypothesized to affect the quality of interactions among individuals within a school, which in turn influence individuals' beliefs and behavior. Through analyzing data collected in Chicago Public Schools, Bryk and Schneider (2002) reported that schools marked by high levels of relational trust were much more likely to see improvements in students' math and reading scores.

Along with relational trust, collective responsibility among individuals within a school has emerged as a strong predictor of teacher and school effectiveness. At its core, the concept of collective responsibility places emphasis on the extent to which individuals take shared responsibility for improvement (particularly related to student outcomes) and work together to move towards organizational improvement (Bryk and Schneider 2002; Bryk et al. 2010; Penuel et al. 2009). Thus collective responsibility goes beyond making an individual contribution (i.e., by being effective in your own classroom), to participating in relationships within the school that support organizational goals. For example, research has shown that teachers who identify with the collective are more likely to provide support and resources to others within a school regardless of the strength of individual ties (Frank 2009).

An important take-away from the research of Rosenholtz, Bryk and Schneider, and others focusing on the social organization of schools, is that the work of teachers is often not as isolated as oft depicted (e.g., Lortie's "egg-crate school" metaphor for teacher isolation). Rather, teachers operate within social networks that shape the experiences of teachers in many ways. Within a school, these relationships manifest social capital, or resources that are linked to a network of individuals (Bidwell 2000; Bourdieu 1986; Coleman 1988). Therefore, levels of social capital within a school are dependent upon attributes of individuals (e.g., levels of content or pedagogical expertise) and the quality and extent of relationships among individuals. For example, teachers in schools marked by high levels of relational trust and collective responsibility are more likely to have frequent interactions around instruction, curriculum, and assessments (Bryk and Schneider 2002; Bryk et al. 2010; Coburn and Russell 2008; Kardos et al. 2001; Youngs 2007). These high-quality social networks produce high levels of social capital, and such interactions have been shown to improve teacher and organizational effectiveness (Ingersoll and Strong 2011).

The social organizational context of schools also directly affects the implementation of external and internal policies and reforms. In an era of increased governmental accountability at the school and teacher level, it is critical that we develop better understandings of the ways in which social networks mediate policies which impact teachers' work. Researchers have continually found evidence that the social organizational context of a school influences policy implementation (e.g., Coburn 2001; Coburn and Russell 2008; Frank et al. 2004; Penuel et al. 2009). Policy sense-making occurs in the collective as groups share information and generate common interpretations of policy expectations and goals. This collective sense-making can emerge from deliberate activities (e.g., planning committees), but it also emerges from informal social networks within a school (Coburn 2001; Weick and Roberts 1993). For example, in an in-depth case study of an elementary school implementing reading instruction reform, Coburn (2001) found that teachers turned to colleagues to make sense of the policy reforms, and that "patterns of interaction and the conditions of conversation in formal and informal settings influence the process by which teachers adopt, adapt, combine, and ignore messages from the environment, mediating the way messages from the environment shape classroom practice" (p. 162).

In addition to aspects of policy sense-making at the individual and collective level, often times the actual nuts and bolts of policy implementation relies upon the diffusion of information and resources among individuals (Coburn and Russell 2008; Frank et al. 2004; Penuel et al. 2009, 2010). As such, a teacher's own social network (i.e., access to information, resources, and support) mediates her ability to effectively implement

reforms at the classroom level (Penuel et al. 2009). For example, in a case study of two schools implementing literacy instruction reforms, Penuel et al. (2009) found that the structure of the internal social organization of the two schools impacted teachers' access to expertise and the distribution of resources among teachers which in turn impacted changes in teachers' instructional practices. More specifically, one school relied on outside resources to provide expertise and foster collaboration among teachers, which ultimately was less effective than in the other school where the leadership sought to draw upon internal strengths and relationships to foster reform.

Overall, the research reviewed in this section emphasizes that teachers' work occurs within the dynamic social environment of particular schools. Teachers' work therefore centers on the interplay between their own background and characteristics, the constraints of the profession itself, and the social organization of the school environment. These elements define the norms and expectations for teachers' work and directly influence teachers' instructional practice and effectiveness. Therefore, sociological research on teachers' work and effectiveness should attend to these important and dynamic elements of the profession.

12.5 Improving Teaching Quality

This chapter began by referencing Hollywood depictions of schooling, which often show the work of an exceptional teacher who rises above her incompetent colleagues in a low-performing school. Such depictions make for compelling narratives, but they are a substantial exaggeration of reality. The research discussed in this chapter, which includes classic works in the sociology of education but also the economics of education and subject-matter disciplines in education, finds that teachers do indeed vary substantially in their effects on student achievement. Yet, most teachers in the United States are not only well-qualified (see Table 12.1), but even teachers in so-called "low-performing schools" are effective at raising achievement growth. In our view, given the social challenges facing schools in many communities, *the vast majority of teachers are generally competent at increasing student achievement*.

At the same time, there is clearly room for improvement in teaching quality, which is particularly evident in close studies of the teaching process (e.g., Hiebert et al. 2005; Weiss et al. 2003). Raising the aggregate quality of teaching, and making sure that all students have access to high-quality instruction will help address persistent gaps in educational outcomes. In order to do so, multiple reforms and initiatives must be pursued simultaneously, because effective teaching is the product of a complex set of factors at the teacher- and school-level. The many specific state policies that impact teacher quality (including teacher licensure, standards for accrediting teacher preparation programs, teacher evaluation and accountability, teacher compensation, and policies affecting working conditions, etc.) are too numerous to be considered in detail here. Instead, we conclude by emphasizing three general principles of reform for teaching quality consistent with the research discussed in this chapter. In all of the principles, we stress that reforms targeting improvements in teacher effectiveness should encompass the social organizational factors of a school that influence teachers' work and effectiveness.

12.5.1 Teacher Socialization

First, in both the recruitment of teachers into the profession as well as initial training in teacher education programs, reforms must stress rich socialization into the profession, such that teachers are equipped to deal with the inherent challenge and uncertainty of teaching. The socialization of teachers into the profession occurs through different phases over time, beginning with preservice training through teacher preparation programs and in-service training in the early years of a teacher's career (Lortie 1975; Staton and Hunt 1992). Early effective socialization of novice teachers into the profession, including socialization into their own specific

school context, is critical for promoting effective teacher practices and reducing teacher attrition (Jones et al. 2013; Pogodzinski et al. 2013; Ingersoll and Strong 2011).

Teacher socialization relays the behaviors, knowledge, and attributes that are needed to flourish as a teacher in a particular school context (Feiman-Nemser 2010; Staton and Hunt, 1992). Additionally, socialization efforts help build relationships among novice teachers and their more senior colleagues through which novice teachers access information, resources, and support as they navigate their early years in the profession (Coleman 1988; Frank et al. 2004). Across numerous organizational contexts, socialization efforts have been associated with worker outcomes such as turnover, satisfaction, stress, and performance (Feldman 1981; Van Maanen and Schein 1979).

Teachers are socialized through both formal and informal mechanisms. Formally, many teachers experience some type of district or school sponsored induction, most often including formal mentoring (Ingersoll and Strong 2011). Mentoring can provide rich opportunities for novice teachers to engage in meaningful learning activities and influence practice (Youngs 2007). Novice teachers are also socialized through their day-to-day interactions with their colleagues which provide opportunities to access varying information, resources, and support and can lead to changes in teachers' beliefs and practice and influence their career decisions (Kapadia et al. 2007; Pogodzinski et al. 2013).

Whether formal or informal in nature, the quality of socialization and the impact it has on teachers' beliefs and practices largely depends on whom novices interact with and what they talk about (Kardos et al. 2001; Smith and Ingersoll 2004). Therefore, it is essential that efforts are made by school leaders to ensure that novice teachers are engaged in high-quality interactions with colleagues around the technical core of teaching and learning. For example, research has shown that having a mentor in the same field as the novice teacher has a positive association with the frequency and quality of interactions (Pogodzinski 2012), and ultimately, retention (Smith and Ingersoll 2004). Additionally, steps should be made to increase the likelihood that novice teachers are interacting with teachers across the school who have the knowledge, skills, and dispositions which are more likely to elicit growth among novice teachers (Crow and Pounder 2000; Penuel et al. 2010).

12.5.2 Professional Development

Second, ongoing efforts must be made to renew experienced teachers' enthusiasm and expertise with rich, content-oriented professional development. Professional development (PD) for teachers includes a wide range of activities, from stand-alone conferences and workshops, to internships in degree programs, to collaborative curriculum development with colleagues. By 2006, teachers were averaging up to 100 h of professional development, all inclusive, per year (Birman et al. 2009). Yet, the typical activities offered by states and districts have been criticized for being intellectually superficial (Ball and Cohen 1999). Currently, it is difficult to know how many teachers receive professional development that supports their work in a meaningful way, or themselves generate active learning opportunities for their colleagues. Much of the research literature on teacher professional development itself lacks sufficient rigor to inform program adoption efforts, but the limited existing findings show that high-quality professional development, when available, improves teacher effectiveness (Yoon et al. 2007). In all, we suspect that far too few teachers have regular access to transformative and sustaining learning opportunities.

To address shortcomings in professional development, there have been increased calls for job-embedded professional learning opportunities for teachers. The term job-embedded refers to learning opportunities that are situated in the immediate context within which individuals and groups of teachers operate, and thus, are relevant to teachers' day-to-day practices and experiences (Croft et al. 2010). One reason that job-embedded professional development may be more effective

than traditional "conference style" PD, is that it better encourages reflective practice (Camburn 2010; Camburn and Han 2015; Putnam and Borko 2000). Reflective practice refers to thoughtfully considering one's own actions and experiences to refine a set of disciplinary or professional skills (Schon 1987). Professional development to enhance reflective practice might include: engaging teachers in analyzing student work, conducting peer-observations, sharing and discussing lesson plans with mentors or colleagues, or even carrying out "action research"-type studies of alternative pedagogical approaches.

However, to date, the large-scale implementation of job-embedded professional development has been challenging due to the difficulties and costs associated with rigorous in-class observations of teaching, which form the basis of evidence-based reflection. Indeed, even under a relatively minimal schedule of observation, administrators and curriculum support personnel have difficulty providing high-quality, in-depth feedback to teachers (Kraft and Gilmour 2016). One solution to this challenge is to use technology to automate the process of observation and feedback, giving teachers themselves flexibility and agency in analyzing their own teaching.

Research is currently underway by a team of computer scientists (in collaboration with the first author of this chapter and other educational researchers) to develop an automated observational system to measure dimensions of teaching effectiveness associated with student engagement and achievement growth that are exhibited/expressed in classroom discourse (Olney et al. 2017). This work uses digital signal processing, natural language processing, and machine learning to record and analyze classroom audio. The system is designed to meet the technical requirements and constraints of real-world classrooms and school budgets (D'Mello et al. 2015). To date, analyses of transcript data from tens of thousands of questions in 418 class sessions show that it is possible to automatically detect dialogic question properties (e.g., "authentic" questions vs test questions) at an accuracy level that rivals human coding of questions with similar contextual information (Samei et al. 2014). We have also succeeded in the automatic identification of teachers' basic instructional time use; for example, lecture vs question and answer sessions vs small group work (Donnelly et al. 2016). We are currently refining approaches to speech recognition, which is difficult in the complex, noisy environment of the classroom, to further improve automation. While much work remains to achieve a fully-functioning, closed-loop technology for use by teachers, the initial results are promising.

In addition to stressing reflective practice among individual teachers, research on professional learning opportunities emphasizes the importance of explicitly cultivating a shared vision for school improvement and values among teachers, in order to promote collective efforts towards goal-oriented improvement (Darling-Hammond and McLaughlin 1995; DuFour and Eaker 1998; Levine and Shapiro 2004). In addition, Darling-Hammond and colleagues (2009a, b) argue that effective professional development should be focused on the technical core of teaching and learning and do so in a way that strengthens ties among teachers within the school. As previously illustrated, the work life of teachers does not occur in total isolation from other adults within the school. This is particularly true in an era of heightened school accountability and whole-school reform efforts.

Overall, the concept of collective responsibility conveys that relationships among individuals within a school have the potential to mediate professional development efforts, and in some circumstances relationships themselves are impacted by such efforts (Coburn and Russell 2008; Penuel et al. 2009). For example, professional learning communities (PLC) can be purposefully created to strengthen ties among teachers within a school and facilitate the sharing of information, resources, and expertise. This is particularly useful when experts are embedded within a PLC to help diffuse knowledge. Such efforts also draw from naturally occurring ties related to personal and professional interests, as well as common areas of teaching (e.g., grade level or content areas) which strengthen ties and

increase the opportunities for enhancement of social capital. Additionally, professional development centered on relationships within a school are by default "job embedded," thus relating to the shared realities of the local school context (Croft et al. 2010).

12.5.3 Organizational Climate

Third, teaching quality is strongly affected by the context of teachers' work, so reforms that improve the overall climate of the school and students' opportunity to learn also improve the work of individual teachers. Research in the sociology of education has long shown that the organizational functioning of schools is impacted by the social context in which they are embedded (see Schneider, Introduction). We have already touched upon this in relation to the need to develop relational trust and collective responsibility among teachers and between teachers and administrators as one important aspect of organizational climate (e.g., Bryk and Schneider 2002; Bryk et al. 2010), but organizational climate relates more broadly to all stakeholders within a school community. Specifically, climate relates to the enduring aspects of an organization such as routines, practices, policies, and beliefs among stakeholders which define an organization (Halpin and Croft 1963; Tagiuri 1968). For example, even within a single school district, elementary schools which serve similarly situated students can operate very differently based on the organizational climate and the perceptions of students, teachers, administrators, and parents which emerge.

Therefore, organizational climate does not just define the organization in structural terms (e.g., formal policies related to student attendance); rather, how members of a school community perceive the routines, practices, and policies influences their beliefs and practices (Halpin and Croft 1963; Pogodzinski et al. 2013; Tagiuri 1968). It is essential then that school communities forge ties among all members of the school community to ensure healthy engagement, resource flow, and common efforts towards realizing shared goals. For example, the presence or absence of social networks and other mechanisms connecting schooling with job placements affects students' understanding of how their own educational efforts matter, especially for students who do not immediately apply to college (Rosenbaum 2001). When students perceive strong school-to-work connections, and thus have an incentive to be engaged, this strengthens the individual teacher's ability to work with students. Likewise, the behavioral climate of a school, which every teacher contributes to but does not alone control, has a profound impact on teachers' work lives (Ingersoll 2001; Kelly 2004). Clearly then, beyond the teacher herself, improving teaching quality requires strengthening social supports for schooling related to students directly.

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