



The Impact of Teacher Experience

Examining the Evidence and Policy Implications

Jennifer King Rice

Many occupations recognize employees' years of experience as a relevant factor in human resource policies, including compensation systems, benefits packages, and promotion decisions. The idea is that experience, gained over time, enhances the knowledge, skills, and productivity of workers.

In education, teacher experience is probably *the* key factor in personnel policies that affect current employees: it is a cornerstone of traditional single-salary schedules; it drives teacher transfer policies that prioritize seniority; and it is commonly considered a major source of inequity across schools and, therefore, a target for redistribution. The underlying assumption is that experience promotes effectiveness. But is this really the case? Do students attain higher levels of achievement when taught by more experienced teachers? What is the relationship between teacher experience and teacher productivity?

The impact of experience is strongest during the first few years of teaching; after that, marginal returns diminish.

Over 40 years of teacher productivity research suggests that the simple assumption that "more is better" requires greater nuance; experience effects are complex and depend on a number of factors. Recent evidence from CALDER studies using rich state datasets

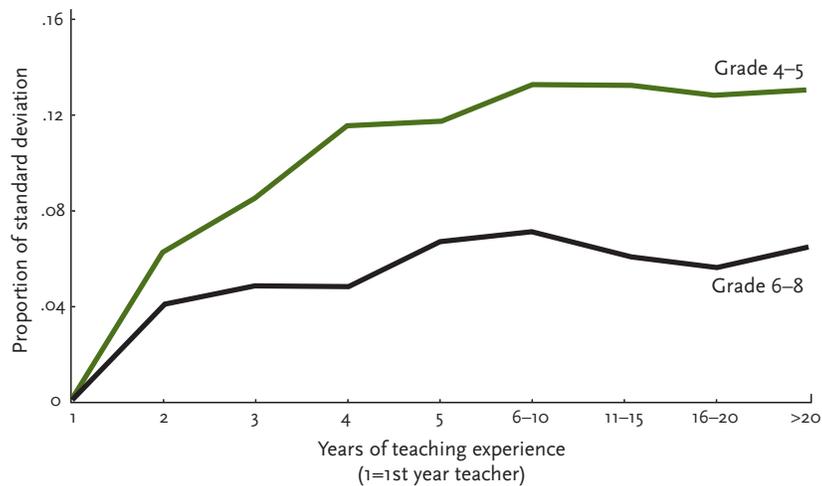
provides new insight into the effects of teacher experience. Several key findings emerge, some confirming previous understandings and others raising new questions. These findings have important policy implications.

Impact of Experience Strongest during First Few Years of Teaching

Experience matters, but more is not always better. The impact of experience is strongest during the first few years of teaching; after that, marginal returns diminish. A number of CALDER studies confirm findings from existing research that, on average, brand new teachers are less effective than those with some experience under their belts (Clotfelter, Ladd, and Vigdor 2007a, 2007b; Harris and Sass 2007; Kane, Rockoff, and Staiger 2006; Ladd 2008; Sass 2007). Early-career experience has a clear payoff in teacher effectiveness,¹ and the impact is stronger than the effect of most other observable teacher-related variables including advanced degrees, teacher licensure tests scores, National Board certification at the elementary level, and class size (Clotfelter et al. 2007a; Ladd 2008; Sass 2007).

Teachers show the greatest productivity gains during their first few years on the job, after which their performance tends to level off. A study using New York City data illustrates the diminishing marginal returns to experience (Boyd et al. 2007). As shown in figure 1, the largest gain in math achievement attributable to teacher experience is associated with teachers' progression from their first year

Figure 1. Improvements in Math Student Achievement Attributable to Additional Teacher Experience



SOURCE: Boyd et al. (2007).

of teaching to having one full year of experience.² That first year of experience accounts for almost half the cumulative experience effect in grades 4–5 (.06 standard deviation [SD]) and more than half the cumulative effect in grades 6–8 (.04 SD).

This and other research shows that, on average, teachers with more than 20 years of experience are more effective than teachers with no experience, but are not much more effective than those with 5 years of experience (Ladd 2008). Studies have also documented some evidence that effectiveness *declines* after some point, particularly among high school teachers. In fact, evidence suggests that the most experienced (greater than 25 years) high school mathematics teachers may be less effective than their less experienced counterparts (Ladd 2008) and even their inexperienced colleagues (Harris and Sass 2007).

Despite the positive effects of early-career experience, the performance distributions of experienced teachers versus those with little or no experience reveal considerable overlap in value-added scores in both mathematics and

reading. As shown in figure 2, while less experienced teachers tend to be less effective than more experienced teachers as a whole (evidenced by the performance distributions of teachers with no experience and one to two years of experience shifted to the left of the performance distribution of more experienced teachers), many less experienced teachers have value-added scores comparable to or exceeding those of their more experienced counterparts (evidenced by the substantial overlap among the three distributions). Research has shown that other policy-relevant factors—such as a teacher’s academic training and preparation program—may equal or even outweigh the impact of early-career experience.³

Further, the differential attrition of teachers with different levels of effectiveness may confound findings about the effects of teacher experience. While some evidence suggests that teachers who remain teaching after three years are less effective on average than those who leave (Clotfelter et al. 2007a), other research has found that less effective teachers are more likely to transfer and leave teaching (Boyd et al. 2009; Goldhaber, Gross, and Player 2007; Harris and Sass 2007). These conflicting findings raise questions about whether the measured effects of experience reflect improvement with experience or higher attrition of less effective teachers.

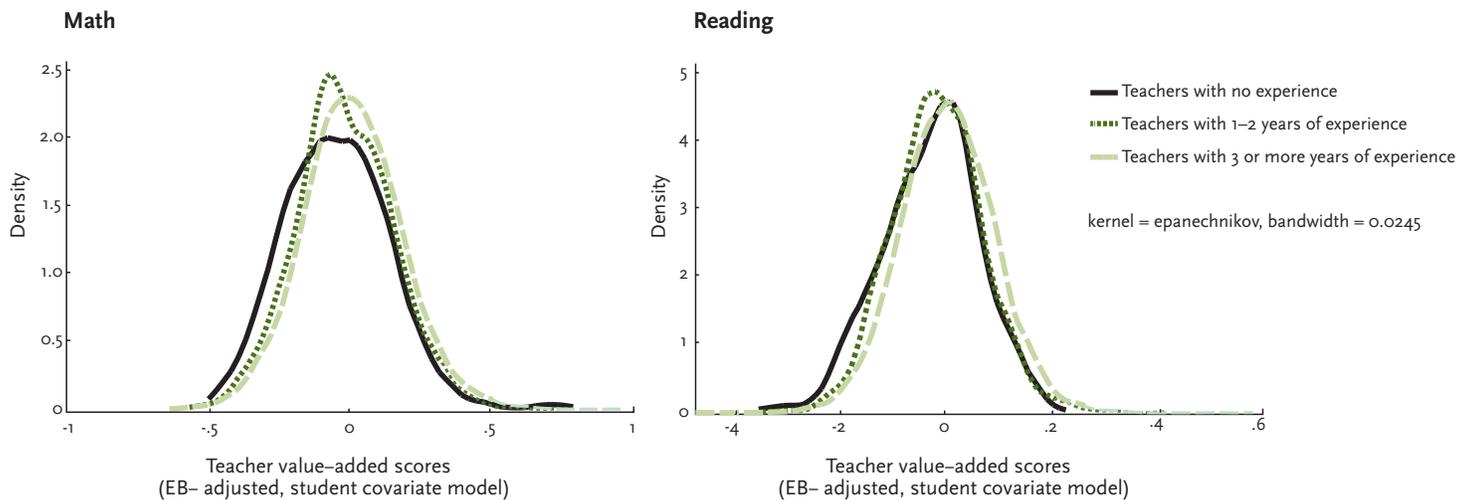
Positive Effect of Early-Career Teaching Experience Strongest and Most Consistent in Elementary and Middle School, and in Math

The magnitude of the effect of teacher experience varies depending on the teacher’s level of education and the subject area. The impact of early years of experience is strongest in the subject of math and more consistent at the elementary and middle school levels than at the high school level (Harris and Sass 2007). According to one study using data from North Carolina, elementary school teachers with one or two years of experience are more effective, on average, than teachers with no experience by .06 SD in math achievement, and .03 SD in reading achievement.

Findings on the impact of teacher experience at the high school level are less definitive. A study using North Carolina high school data estimates the effect of early-career experience as .05 SD, with the largest effects observed for student achievement in mathematics and biology.⁴ In contrast, a study using data from Florida finds little evidence

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Figure 2. Comparing Value-Added of Novice versus Experienced Elementary School Teachers



SOURCE: Sass et al. (2010).

of an impact of early-career experience among high school teachers, and no effect (or even a negative effect) of teaching experience beyond the first several years on high school student achievement in mathematics and reading (Harris and Sass 2007).

Teachers with Less than Three Years of Experience More Likely to Teach in High-Poverty Schools

Given the general finding that teacher experience—or more accurately, teacher inexperience—is systematically related to teacher productivity, questions surrounding the distribution of inexperienced teachers have policy significance. Studies offer compelling evidence of an uneven distribution of inexperienced teachers that is systematically related to school and student characteristics (Boyd et al. 2007; Clotfelter et al. 2007; Sass et al. 2010). Teachers with three or fewer years of experience (those shown to be less effective, on average) are more likely to be teaching in high-poverty schools. A study using data from North Carolina shows that the quartile of schools with the highest percentage

of students qualifying for free and reduced-price lunches have the highest percentage of teachers with less than three years of experience.⁵

The distribution pattern of inexperienced teachers is similar to those of other teacher credentials including the percentage of teachers with non-regular licenses, with lower test scores, and without NBCT certifications (Clotfelter et al. 2007). One policy response is to redistribute teachers holding various credentials more evenly across different types of schools. However, such a strategy assumes that the uneven distribution, not the uneven productivity, of teacher credentials matters most. In other words, redistributing inexperienced teachers will reduce achievement gaps *only* if experience has similar payoffs in student performance across different types of schools.

Teacher Quality Gap between High- and Low-Poverty Schools Attributable to Lower Productivity Returns of Experienced Teachers in High-Poverty Schools

In a study of the value-added of teachers in high-poverty and lower-poverty schools in North Carolina and Florida,⁶ CALDER researchers find that the solution to the achievement gap attributable to disparities in teacher quality is not as straightforward as we might believe. The evidence confirms that high-poverty schools tend to have less effective teachers as measured by their value-added to math and reading achievement,⁷ and that high-poverty schools tend to have greater within-school variability in the value-added of teachers.

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High-poverty schools are doubly disadvantaged: they have higher proportions of inexperienced teachers, and their experienced teachers are less effective.

The gap in the effectiveness of teachers between high- and lower-poverty schools is most pronounced at the bottom of the teacher performance distribution.⁸ One explanation is that the least qualified teachers in high-poverty schools have worse qualifications than the least qualified teachers in lower-poverty schools. An alternate explanation is that the return to teacher qualifications is lower in high-poverty schools—that is, the productivity gain from an increase in a given characteristic may differ systematically across school settings, so the “payoff” associated with teacher qualifications is not as great in high-poverty schools.

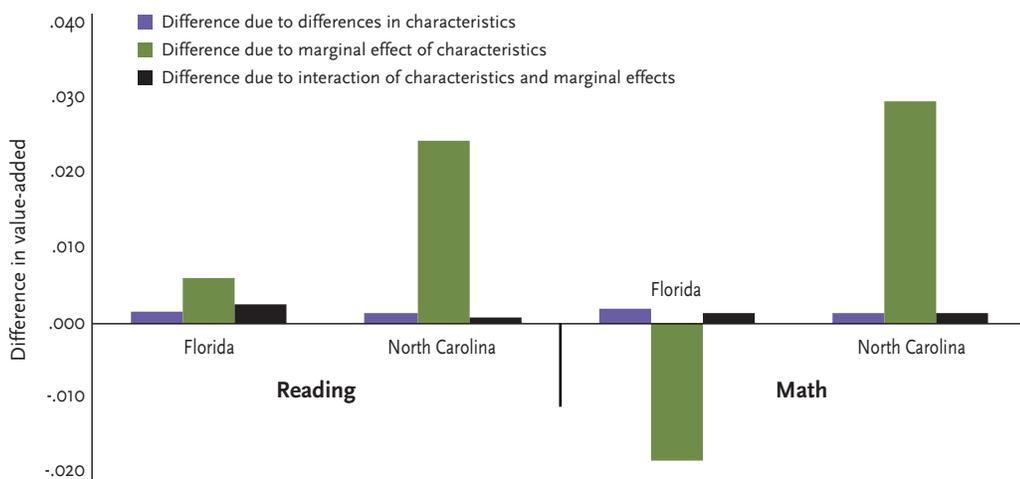
The study finds that while some of the difference in teacher effectiveness across high- and lower-poverty schools is explained by differences in observable teacher characteristics (experience, advanced degree, licensure status), most of the gap is attributable to differences in the marginal effect (the “payoff”) associated with these qualifications across the two types

of schools (Sass et al. 2010). Figure 3 illustrates this finding by decomposing the differences in teacher value-added across high- and lower-poverty schools.

In most cases, the effectiveness of inexperienced teachers in high-poverty schools is comparable to that of inexperienced teachers in lower-poverty schools; differences in the performance of *experienced* teachers surfaces as the dominant source of the teacher quality gap. A closer look at the relationship between teacher value-added and teacher characteristics reveals that the returns to experience are, in fact, lower and less consistent among teachers in high-poverty schools.⁹ Figure 4 shows that the returns to three to five years of experience are similar in high- and lower-poverty schools. However, among more experienced teachers, the payoff to years of experience is lower in high-poverty schools.

High-poverty schools are doubly disadvantaged when it comes to teacher experience: they have higher proportions of inexperienced teachers, *and* they have a lower payoff (i.e., marginal effect) associated with their experienced teachers. Since the marginal-effect disadvantage accounts for the majority of the teacher quality gap (figure 3), distributing experienced teachers more evenly across high- and low-poverty schools will have a limited effect.

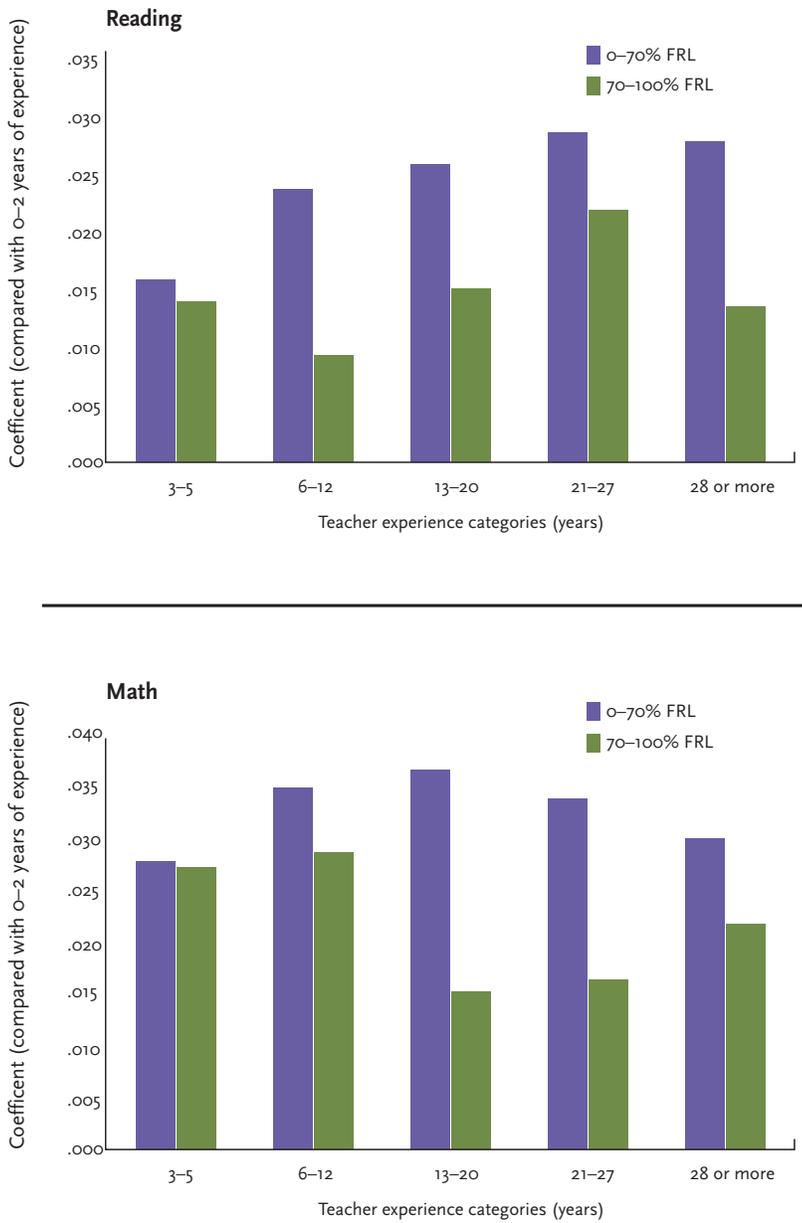
Figure 3. Decomposition of Difference in Teacher Value-Added across High-Poverty and Lower-Poverty Schools



SOURCE: Sass et al. (2010).

NOTE: Teacher characteristics include years of experience, advanced degree, and licensure status.

Figure 4. Payoff to Teacher Experience in North Carolina: Elementary School Reading and Math, 0–70% FRL vs 70–100% FRL



SOURCE: Sass et al. (2010).

Implications for Teacher Policy

The CALDER research findings have important implications for teacher policy. Following are three recommendations.

Frontload Experience-Based Compensation

The work that documents the disproportionate impact of experience in the first few years of teaching, compared with additional years of experience later in a teacher’s career, suggests that compensation aimed at rewarding experience-based productivity may be best front-loaded in the salary schedule. Besides fundamentally altering the way compensation is currently tied to experience, this policy change may function as a recruitment tool to bring more high-quality teacher candidates into the field. Beyond the first several years of teaching, experience is a less useful indicator of increased productivity, so compensation systems should focus on (or at least include) other indicators of effectiveness.¹⁰

Implement Evaluation, Professional Development, Compensation, and Dismissal Policies That Encourage Ongoing Effectiveness among Veteran Teachers

The findings that, in some cases, veteran teachers may be less effective than their less-experienced counterparts suggest that researchers and policymakers should consider strategies to encourage high performance well into a teacher’s career. Perhaps experienced teachers are not staying up on the latest curricular and pedagogical advances; or, the decline in performance could simply be a function of teacher burnout. Either way, targeted professional development and reward structures should be in place to encourage the ongoing development of teachers’ skills that will enable them to deliver state-of-the-art instruction.

The decline in performance among the most experienced teachers is most evident at the high school level, suggesting that this is where such attention should be focused. In cases where more veteran teachers are unable to maintain performance levels with adequate support and professional development, mechanisms for alternative assignments or even dismissal should be considered. The evidence that the most experienced teachers may not be the most effective should prompt policymakers to reexamine the common practice of determining teacher layoffs based on seniority. This is not to say seniority is not important, but such policies may undermine efficiency.

Look Beyond Policies to Distribute Inexperienced Teachers Evenly across High- and Low-Poverty Schools, and Identify Retention Strategies to Increase Returns to Teacher Experience in High-Poverty Schools

While findings on the disproportionate representation of inexperienced teachers in high-poverty schools suggest that efforts should be made to distribute teachers with at least some experience more fairly across schools, the CALDER work presents compelling evidence that policies requiring an equal distribution of inexperienced teachers will be insufficient to narrow the gap in teacher effectiveness between high- and low-poverty schools. Policymakers should look at the potential sources of the differences in the productivity of teacher qualifications across high- and lower-poverty schools. Consider several possibilities.

One source of the productivity difference may be teacher mobility patterns. Several trends may be at work: the lowest-quality teachers may be more likely to be hired and to remain in high-poverty schools; as high-quality teachers in high-poverty schools gain more experience, they may move to lower-poverty schools with a greater number of higher-achieving students; and the lowest-quality experienced teachers in low-poverty schools may eventually end up in high-poverty schools, perhaps as a result of policies requiring that all schools be staffed with “highly qualified teachers.” These sorting trends benefit students in lower-poverty schools, while having a negative impact on students in high-poverty schools (Boyd et al. 2009).

Another possibility is that teachers in high-poverty schools may learn less about how to be effective in those settings, perhaps because of the complexity of the work or because of inadequate professional development opportunities. For instance, evidence suggests that less-experienced teachers, who are overrepresented in high-poverty schools, are more likely to be matched with students who have difficulty learning (Goldhaber et al. 2007). In high-poverty schools without adequate teacher supports, teaching low-performing students may become an even more challenging task for novice teachers.

Finally, being poorly equipped to deal with these challenging environments, teachers who remain in high-poverty schools may burn out faster than their colleagues who are working

in less challenging settings. In all these cases, the anticipated effect of experience is not fully realized in high-poverty settings.

The findings on the distribution of and returns to experience in high- and low-poverty schools have several implications. Again, researchers and policymakers should carefully consider dismissal policies for ineffective experienced teachers; the adequacy of professional development opportunities for teachers in high-poverty schools; and the ability of administrators in high-poverty schools to assess teacher performance, provide support where needed, and initiate dismissal in cases when ineffective teachers are not able to improve their performance. Further, the federal requirements that schools be staffed with “highly qualified teachers” may leave principals of high-poverty schools little choice but to hire and retain teachers who are highly qualified, even if they are of low quality. Policies that require a certain distribution of experienced teachers may exacerbate this problem by adding yet another qualification that may or may not relate to effectiveness.

Notes

1. Multiple studies using data from North Carolina and Florida show that, on average, teachers with 1–2 years of experience are more effective than teachers with no experience (Clotfelter, Ladd, and Vigdor 2007a, 2007b; Harris and Sass 2007; Ladd 2008).
2. Figure 1 shows the gains to experience for math achievement in a model that employs teacher fixed effects; thus, increments to value-added are identified only from teachers who persist from one year to the next. Teachers who are in their first year of teaching when the tests are administered to students are indicated by 1, teachers who are in their second year of teaching are indicated by 2, and so forth.
3. Boyd and colleagues (2008) identify attributes of teacher preparation programs (e.g., capstone project, teaching practice) that rival the effect of the first year of teaching experience. Xu, Hannaway, and Taylor (2009) find that the effect associated with being a Teach for America teacher more than offsets lack of teaching experience, either because of teachers' better academic preparation in particular subject areas or because of other unmeasured factors such as motivation.
4. This is the effect of high school teachers with 1–2 years of experience compared with teachers with no experience (Clotfelter et al. 2007b).
5. Clotfelter, Ladd, Vigdor, and Wheeler (2007) find that among elementary schools in the highest poverty quartile, 18.7 percent of teachers have less than three years of experience, compared with 13.3 percent of teachers in elementary schools in the lowest poverty quartile. At the middle school level, the disparity is more dramatic: 24.6 percent of teachers in the highest poverty schools have less than three years of experience, compared with 13.9 percent in the lowest poverty schools. The highest poverty high schools are staffed with 17.3 percent of teachers who have less than three years of experience compared with 14.6 percent in the lowest poverty high schools. This general pattern is confirmed in a study using data from Florida and North Carolina (Sass et al. 2010).
6. In this study, high-poverty schools have 70–100 percent of students qualifying for free and reduced-priced lunches (Sass et al. 2010).
7. Math teachers in Florida tend to be an exception to the general findings of this study.
8. This finding suggests that the problem is not that high-poverty schools cannot attract effective teachers: in fact, high-performing teachers are equally effective in high- and lower-poverty schools and, in some cases (e.g., mathematics and reading teachers in Florida), more effective in high-poverty schools.
9. The evidence on the differential returns to graduate degrees and licensure reveals a similar, but less consistent, pattern.
10. Of course, efforts to retain experienced teachers may require ongoing salary increases for years of experience, particularly in settings that struggle with high teacher turnover.

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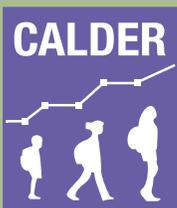
IN THIS ISSUE

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