How good are your teachers?: Trying to define teacher quality

What makes an effective teacher? We all know one. But ask us to describe a good teacher's qualities and the answer is likely a vague "You know it when you see it."

The same dilemma occurs in teacher quality research. Through data tools like Tennessee's value-added scores, we can tell when an effective teacher is in the classroom when we see his or her effects on students' learning. Scores rise and the positive impact can be dramatic, especially for poor and minority children.

What we don't know is exactly what makes that teacher effective. Any one single indicator of teacher quality—for instance, something like years of experience—rarely yields a strong correlation. With Race to The Top creating a stronger emphasis on teacher effectiveness, the question of teacher effectiveness is becoming more acute. Thankfully, recent research has given more insight into whether the characteristics we've been requiring have any correlation. It also highlights the combinations of characteristics that seem to reliably predict a quality teacher.

State Certification: Yes, especially in the subject being taught

Teacher certification comes in many forms. For example, a teacher may be certified in science but actually teach an algebra course. While simply having traditional certification is good, certification in the particular subject being taught often has a stronger correlation with student success. Studies have found that subject-area certification in mathematics for secondary teachers is associated with higher student math performance (Goe 2007, Clotfelter et al. 2007). Similar results have been found in English, and for math at the middle-school level. At the elementary level, the findings are often mixed, with some studies showing little or no difference on elementary students' performance (Gordon et al. 2006).

Evidence on alternative certification is mixed, partially because there are at least 140 different types of programs throughout the country. However, Teach for America, the most visible of these programs, has been studied extensively and newer studies are more positive about the program's results. The particular reason needs to be more firmly established, but the program's focus on students from highly selective colleges seems to benefit the students they teach (Xu, Hannaway, and Taylor 2007).

The research is clear on one aspect: Putting teachers with emergency or no certification has, on average, a negative effect on student achievement (Goe 2007, Darling-Hammond et al. 2005).

Subject-Matter Knowledge: Yes

It seems intuitive that teachers need to be well-versed in the subjects they teach. However, large numbers of teachers lack a major in their main field of assignment (NCES 2008), usually because of emergency staffing needs.

Most studies before 2005 found that teacher subject-matter knowledge was correlated to higher student achievement. However, current research is more effective at measuring a teacher's impact on the change in student achievement, which has led to more mixed results.

A teacher can demonstrate subject-matter knowledge in several ways:

A teaching credential in a subject: Teachers with a specific credential in the subject are more closely associated with student success.

A major or minor in a subject in college: Not surprisingly, students who had math teachers with a bachelor's degree in math earned higher math scores (Goldhaber and Brewer 2000, Dee and Cohodes 2005).

An advanced degree in a subject: Once again, the impact is primarily felt at the middle or high school levels. In North Carolina, across all subjects, students who were taught by a teacher with a master's degree in the subject were better off than their classmates who were taught by a teacher with just a bachelor's degree (Clotfelder et al. 2007b).

Demonstrating knowledge on a test: Unlike the other three indicators of subject-matter knowledge, teachers with higher test scores (such as on the Praxis exam) are more effective at both the elementary and high school levels.

In all of these studies, no one way of demonstrating subject-matter knowledge showed consistent effects for all students across all subjects. However, taken together, all signs point to the importance of a teacher having an in-depth knowledge of the subject matter, especially at the high school level.

Advanced Degrees in General: No

Most district policies and collective-bargaining agreements assume that teachers with master's degrees and doctorates are more effective than those with bachelor's degrees. However, recent studies have produced evidence that advanced degrees are not associated with higher levels of teacher effectiveness. Simply having any sort of advanced degree (as opposed to advanced degrees in the subject matter being taught) does not contribute to teachers' effectiveness. Moreover, Clotfelter, Ladd, and Vigdor (2006) found a consistently negative effect of a master's degree on student achievement in a study of 4,000 elementary school teachers in North Carolina.

Academic Qualifications: Yes

A clearer way of looking at the whole field of teachers' academic background may be to look at the rigor of the programs they complete and their achievement there, for there is evidence that teachers' academic qualifications are associated with effectiveness. Students whose teachers have higher math SAT scores have higher math achievement; so, too, do students whose teachers attended a more competitive college, although less so (Boyd et al. 2007). Higher scores on teacher licensing tests (e.g., the Praxis exam) are also associated with higher levels of student achievement, particularly in math (Clotfelter, Ladd, and Wigdor 2007).

Seniority: More than four years

As with any profession, teachers benefit from experience. The evidence shows, though, that experience matters only up to a point. Most of the gains from experience occur in the first four years of teaching. (Rockoff 2004; Rivkin, Hanushek, and Kain 2005; Kane, Rockoff, and Staiger 2006) It is unclear whether this plateau effect reflects the possibility that experience yields little benefit after the first few years, or that the more able teachers leave the profession after that time.

How good teachers are distributed

Whatever measures you use to define a good teacher, high-poverty schools and minority students are less likely to have those teachers. For instance, black and Hispanic students are twice as likely as white students to be taught by out-of-field teachers. (Education Trust 2008) Or take the fact that in New York City, 35 percent of teachers in high-poverty schools had failed the state licensure exam on their first try. (Boyd et al. 2007)

Schools should pursue a combination of characteristics

A study of teachers in New York City suggests a combination of characteristics makes a substantial difference. Teachers who were certified and who had stronger academic qualifications (as described in the above section) were more effective in the classroom, reducing the achievement gap between low- and high-poverty students by almost a fourth (Boyd et al. 2007).

Districts that are seeking to raise achievement should consider seeking teachers with the observable characteristics that are associated with effectiveness: certification, academic credentials and experience. In addition, districts might consider consciously placing teachers who were likely to be effective in schools with low-income and minority students.

Finally, keep in mind that these qualities are all something to be looked for during the hiring process. Once teachers are in the classroom, to find out if they are effective, examine a wider range of factors. Value-added scores, as described in the Center's report "Measuring Student Growth," reveal whether a particular teacher is effective inside the classroom. The overall working environment can also affect teacher effectiveness; for more information, visit the Center's report on recruiting and retaining good teachers, "Wanted: good teachers."

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