



State Teaching Policies and Student Achievement

This Brief is based on the following CTP Research Report:

Teacher Quality and Student Achievement: A Review of State Policy Evidence

December 1999

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As new standards for student learning have been introduced across the states, there has been growing attention to the role that teaching quality plays in student achievement. Since 1995, more than 25 states have enacted legislation to strengthen teacher recruitment, education, certification, and professional development, in hopes of boosting the quality of the state's teaching force, and ultimately improving classroom instruction. While evidence suggests that better qualified teachers may make a difference for student learning, there has been little inquiry into the effects of large-scale policies and practices that impact the level of teachers' knowledge and skills in a state or region and which may, in turn, contribute to student achievement.

This Brief summarizes one such inquiry. The analysis uses national surveys of state policies, case studies of state reform initiatives, and state-level data on teachers and other school resources, as well as student achievement, to examine how teacher qualifications and other school factors relate to student achievement. The analysis further examines how policies may influence the level of teacher qualifications within and across states.

Differences in state teaching policies: What might they mean for student achievement?

A review of research on teacher characteristics, classroom performance, and student learning suggests that several kinds of teacher characteristics appear to be related to teacher effectiveness. These include teachers' verbal ability, subject-matter knowledge, knowledge of teaching and learning, and the ability to use a wide range of teaching strategies adapted to student needs. The use of effective practices appears to be influenced by teacher education and professional development, particularly training that focuses on analysis of learning and methods for teaching specific content to different kinds of learners. Fully prepared and certified teachers—those who have both a background in the subject matter they will teach and in the study of how to teach it—are generally found to be more



highly rated and more successful in producing student learning gains than untrained and uncertified teachers. Some studies have found that teachers' knowledge and skills influence student achievement at least as much as student characteristics such as income, race, language background, and parent education.

Differences in state teaching policies. Given the evidence that teacher knowledge and skills strongly affect student learning, it is striking that states differ so much in how they manage policies related to their teaching force. Policy differences are especially noticeable in states' standards for entering the teaching profession and the requirements and resources they apply to preservice and inservice teacher education. In high-standards states like Wisconsin and Minnesota, for example, prospective high school teachers must major in the subjects they will teach and complete at least a semester (15 to 18 weeks) of student teaching. They must also understand a wide range of teaching strategies, how to address regular and special education needs of students, curriculum development and assessment, uses of technology, and child development. By contrast, in Louisiana, prospective high school teachers can be licensed without even a minor in the subject they will teach. Only six weeks of student teaching are necessary, and the state does not require specific coursework in curriculum, teaching strategies, classroom management, uses of technology, or the needs of special education students.

States differ not only in the standards they hold for teachers, but in how these are enforced. More than 30 states allow teachers to be hired on temporary or emergency licenses, without having completed preparation or other licensing requirements. Yet in Wisconsin and eleven other states, no new teachers were hired without a license in their field in 1994, the most recent year for which comparable data are available. In seven other states during that year, 20% or more of the new public school teachers were hired without a license in their field. While such hiring can be a function of teacher

shortages, previous studies have found that much hiring of unlicensed teachers is due not to labor market shortages but to state and district resource allocation decisions, dysfunctional hiring practices, and some communities' preferences for hiring inexperienced or untrained teachers for financial, bureaucratic, and other reasons.

States also differ greatly in their funding for preservice and inservice teacher education, standards for teacher education institutions, and investments in beginning teacher induction programs and continuing professional development. For instance, in 1997, only three states required professional accreditation for schools of education, and only nine funded induction programs with trained mentors for beginning teachers. Student teaching requirements ranged from 5 weeks in Massachusetts to 18 weeks in Wisconsin.

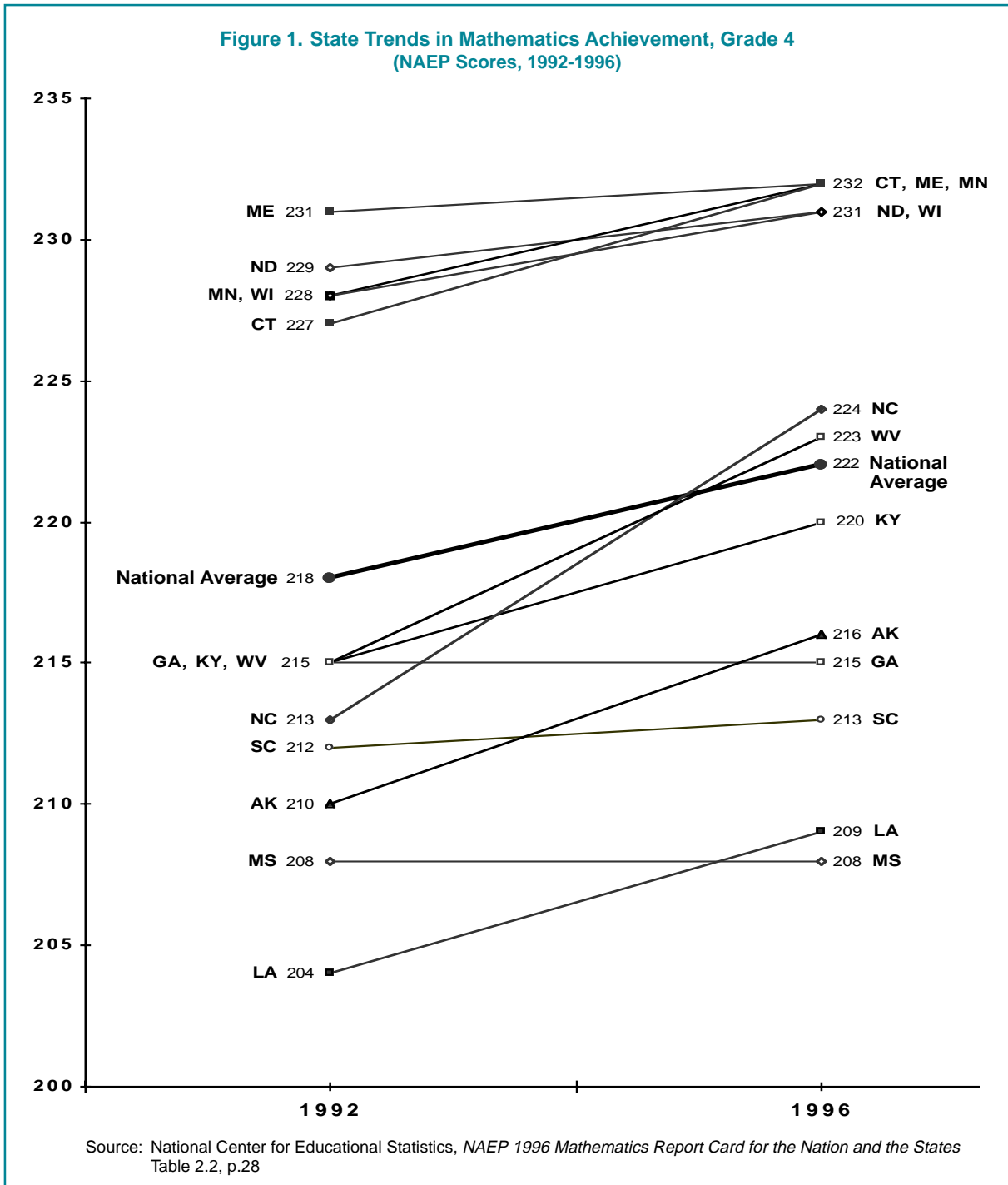
What these policy differences may mean for student achievement. Clearly, state policies differ tremendously in the standards they set for teacher preparation and entry into teaching. Figure 1 shows that student achievement and achievement gains also vary widely across states. These variations appear to parallel the differences in teacher qualifications. Interestingly, the states that repeatedly lead the nation in mathematics and reading achievement have among the nation's most highly qualified teachers and have made long-standing investments in the quality of teaching. The top scoring states—Minnesota, North Dakota, and Iowa, recently joined by Wisconsin, Maine, and Montana—all have rigorous standards for teaching that include requiring extensive study of education plus a major in the field to be taught. In addition, these states rarely if ever hire uncertified teachers or permit out-of-field assignments. States that have the least well-qualified teaching forces, on the other hand, tend to have low levels of student achievement.

Surveys of state policies and examination of states that have pursued major investments in teaching as a reform strategy suggest that policies may be associated with gains in student achievement

The work reported herein was supported under the Educational Research and Development Centers Program, PR/Award Number R308B70003, as administered by the National Institute on Educational Governance, Finance, Policymaking and Management, Office of Educational Research and Improvement (OERI), U.S. Department of Education. The contents do not necessarily represent the positions or policies of the National Institute, OERI, the U.S. Department of Education, or the endorsement of the federal government.

as well. Case studies of states that undertook the most comprehensive teaching policy initiatives during the 1980s—especially Connecticut and North Carolina, and others such as Arkansas, Kentucky, and West Virginia that pursued comprehensive reform initiatives in which teacher quality figured prominently—show evidence of steep gains in student performance from the early to mid-1990s. All of these states enacted

comprehensive policies that raised teacher salaries while strengthening teacher education and licensing requirements and expanding professional development investments. By contrast, states such as Georgia and South Carolina, where reform initiatives across a comparable period focused on curriculum and testing but invested less in teacher learning, showed little success in raising student achievement within this timeframe.



Connections between state teaching policies, teacher qualifications, and student achievement: National evidence

These potential connections between state teaching policies, teacher qualifications, and the level of student achievement were examined more systematically with staffing and achievement data from all states. This analysis sought to disentangle the influences of student population characteristics from those of state policies influencing schooling and teaching. The study used data on state-level student achievement and student characteristics from the National Assessment of Educational Progress (NAEP); indicators of teacher preparation, district hiring standards, class sizes, and other school resources from the national Schools and Staffing Survey (SASS); and data on school expenditures from the Common Core of Data. The analysis includes all 44 states that participated in the state NAEP during the years 1990 to 1996.

The principal findings from this analysis, summarized in Figure 2, indicate that **the strongest and most consistent predictor of a state's average student achievement level is the proportion of well qualified teachers in the state.** Specifically, teacher qualifications account for approximately 40 to 60 percent of the variance across states in average student achievement levels on the NAEP 4th and 8th grade reading and mathematics assessments, after taking into account student poverty and language background. "Well qualified" in this instance means a teacher who is fully certified and holds the equivalent of a major in the field being taught. (For generalist elementary teachers, the major or equivalent is in elementary education; for elementary specialists, the major is in content areas such as reading, mathematics, or special education.)

Conversely, the strongest negative predictors of a state's student achievement are the proportion of new teachers who are uncertified and the proportion who hold less than a minor in the field they teach. These findings are consistent for both reading and mathematics, over four testing years (1990, 1992, 1994, 1996), in both grades (grades 4 and 8) tested by the NAEP. Other teacher-quality variables (such as the percentage of teachers with a Masters degree) are modestly associated with achievement gains.

Related Reading

Ferguson, R.F., & Ladd, H.F. (1996). How and why money matters. In H.F. Ladd (Ed.), *Holding schools accountable* (pp. 265-298). Washington DC: Brookings Institution.

Gallagher, K.S., & Bailey, J.D. (1999). *The politics of teacher education*. Thousand Oaks, CA: Corwin Press.

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

The connection between teacher qualifications and student achievement persists even when student poverty and limited English proficiency, as well as selected school resource measures, are taken into account. Even though adverse conditions facing students are linked to how well they perform in school, these background conditions do not alter the apparent strong connections between their performance and what their teachers know and are able to do. This is so despite the fact that the less advantaged the students, the less likely their teachers are to be fully certified and hold degrees in the subjects they teach. Teacher-qualification measures continue to account for the lion's share of variance in student achievement when per-pupil spending levels and average class size are taken into account.

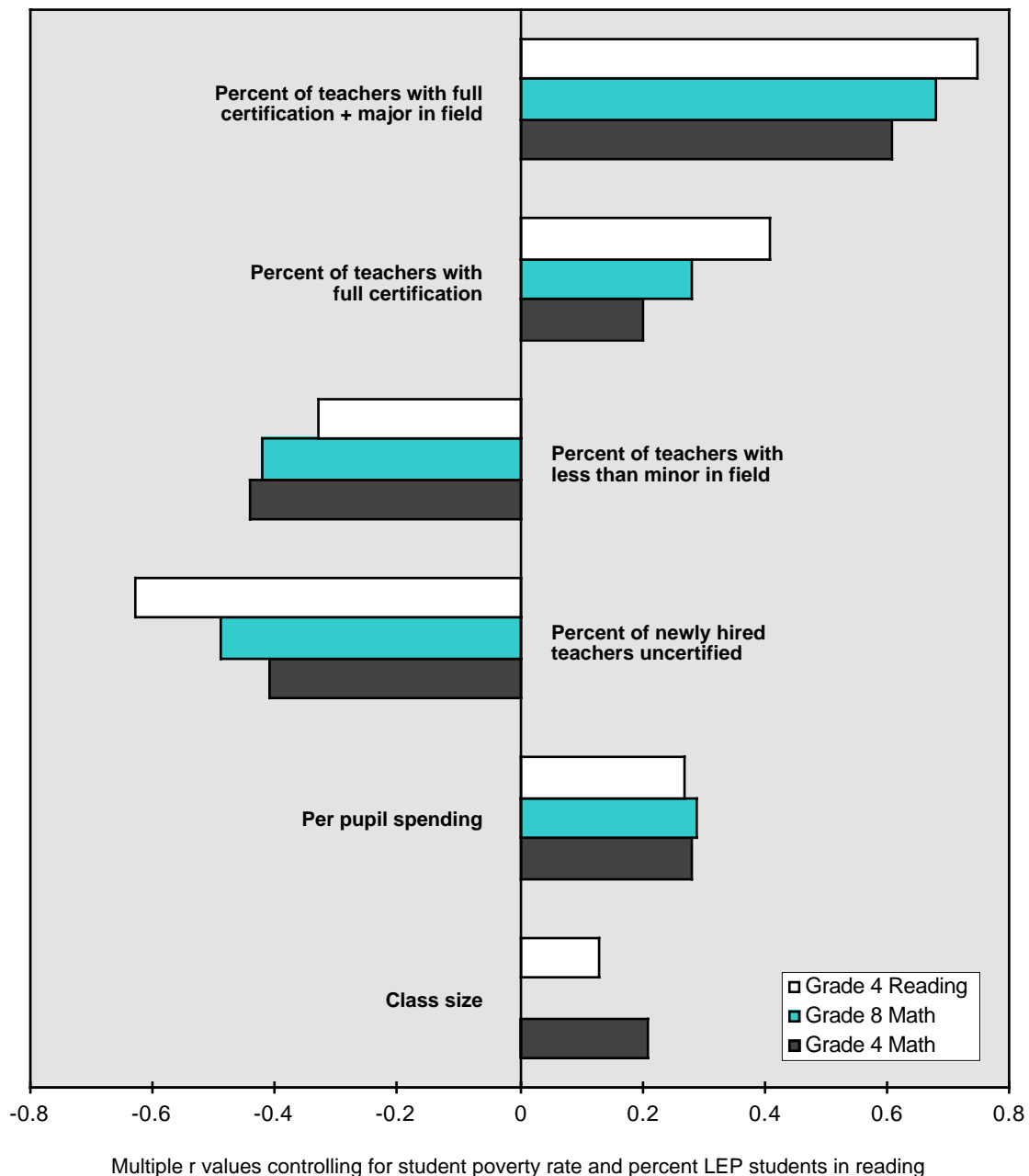
Particular actions by state and local government may help to ensure high proportions of qualified teachers in the state's schools. An additional analysis suggests that states that have put in place mechanisms for setting and enforcing professional standards, coupled with district attempts to honor these standards in hiring teachers, may encourage a high level of teacher qualifications. The percentage of well qualified teachers in a state, for example, is significantly related to the percentage of the state's teacher preparation institutions that meet national accreditation standards (under the National Council for Accreditation of Teacher Education). The proportion of nationally accredited institutions is also inversely related to the proportion of English

and mathematics teachers who are “out of field.” Similarly, the percentage of districts that maintain rigorous hiring standards—insisting on full certification, graduation from an approved teacher education program, and a college major or minor in the field to be taught, as a condition of hiring—is a significant predictor of the proportion of all

teachers who are fully certified and the proportion of new teachers who are uncertified, even after controlling for student poverty, race, and language status.

Institutional accreditation and district hiring standards may, in turn, reflect policies and enforcement mechanisms put in place at the state

Figure 2. Variance in NAEP 1996 Student Achievement Scores Explained by Selected Resources



level. For example, the presence of a state professional standards board prior to 1990 (more than 12 now have them) was associated with higher percentages of districts maintaining rigorous standards for hiring in 1993-94. This association, while statistically significant, was relatively modest, suggesting that many other variables are also at play.

Making sense of state-level patterns

The overall pattern in these data are clear: the quality of the state's teaching force (measured in various ways) is a powerful predictor of student achievement levels, much more powerful than other factors considered in this analysis, including student demographic characteristics and other measures of school resources. The "well qualified teacher" variable may figure so prominently in these analyses because it represents several things that are important to success in the classroom, among them, strong disciplinary knowledge and expertise in teaching and learning. But there may be other features of each state that are unmeasured, or else correlated with indicators considered in this analysis, which also contribute to the pattern of achievement gain.

This analysis used data averaged at the state level, which poses certain limitations. Such averages obscure many differences at the local level, and some school conditions vary much more within states than they do between states. In addition, findings from these analyses cannot capture all the conditions that matter to individual teachers or that make a difference in particular schools or districts. Finally, the pool of students tested may differ across states, making comparisons hard to interpret. Nonetheless, state-level data are a reasonable place to start in assessing broad policy trends, and they can suggest provocative possibilities for policymakers and researchers concerned with school improvement.

Like all studies that examine broad state trends, there are many factors that may influence the findings—student demographics, curriculum and testing programs, teacher salaries, school and class sizes, among them. While this analysis could not test all of these variables, it sheds light on several

and highlights areas where further analysis would be helpful.

Possible explanation 1: Student background? The relationships between teaching qualifications and student achievement hold up, even after controlling for student-background factors like poverty and language background—which have long been known to represent constraints on student learning. This appears to raise a reasonable doubt concerning the widespread perception that the high average achievement levels in certain states are primarily due to the relatively low levels of student poverty. However, there are other variables, such as parental education, that should also be examined, which may influence students' educational opportunities and state and local supports for education.

Possible explanation 2: State testing and other reforms? This analysis did not systematically consider other kinds of reforms at work within the time frame of the student achievement measures. However, an examination of the distribution of student achievement in relation to state testing policies indicated that none of the highest scoring states had implemented state-mandated testing systems during the period in question, while most of the lowest scoring states had fairly extensive state testing systems with high stakes for students and schools. This does not mean that such testing systems cause lower performance, but it does suggest that testing systems by themselves do not create high performance. Case comparisons suggest that, where state reforms have relied primarily on curriculum and testing initiatives and did not include attention to teacher development, the results have been disappointing.

It is also possible that the nature of tests matters. The earliest test-based accountability systems used multiple choice tests of basic skills that are not well aligned with standards aimed at higher-level thinking and performance abilities, or with the National Assessment of Educational Progress tests on which this analysis is based. Some states that have introduced testing systems more recently have emphasized performance-based assessments as part of a more comprehensive approach to change that also includes attention to teachers' preparation for teaching to new standards. Further examination of this matter, particularly in recent years following

the introduction of testing and accountability reforms in many states, would help to illuminate this possibility.

What these findings may mean for state action

While an analysis of this sort does not answer all the questions state policymakers will ask about teacher policies and their effects, the findings, in conjunction with other recent studies, suggest possible avenues for state action. In particular, states interested in improving student achievement may be well advised to attend to the preparation and qualifications of the teachers hired and retained in the profession. It stands to reason that student learning would be enhanced by the efforts of teachers who are more knowledgeable in their particular fields and skillful at teaching those subjects to others.

At the same time, we do not know enough from this analysis or other studies to date about the possible interactions between teacher-quality policies and other reform efforts, among them, changes in student course requirements, curriculum content, testing and accountability requirements, or various resource investments (such as class size reduction). More research and different kinds of studies will help to explore these questions. However, teacher qualifications and teacher development are likely to figure into the story. Many

reforms may not make much difference if teachers do not know how to motivate learning, relate content, manage students, or perform other vital functions of teaching. For example, this study and others suggest that while efforts to reduce class size appear to contribute to student learning (particularly in elementary reading), those gains are more likely to be realized when the smaller classes are staffed by well qualified teachers.

Another implication of this analysis is that state policymakers may be able to craft strategies that help improve the qualifications of their teaching force through policies that guide district hiring standards, the accreditation of teacher education institutions, and the ways in which teaching standards are established and enforced.

In addition to teachers' preparation and ongoing professional development, many state actions can have an impact on teaching quality, and hence, student achievement. These include reorganization of schools to better support teacher-student relationships, curriculum that is aligned to standards and assessments, and joint planning time for teachers, as well as the development of more thoughtful curriculum guidance and more informative assessments of student learning. This analysis has only examined a few of these actions—those that affect most directly what teachers initially bring to the teaching profession. Further work is needed to understand the ways in which teaching quality can be fostered on a wide scale.

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