



This Brief is based on the following
CTP Research Report:

**Out-of-Field Teaching,
Educational Inequality, and
the Organization of Schools:
An Exploratory Analysis**

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The Organization of Schools as an Overlooked Source of Underqualified Teaching

Behind the headlines about a looming and large teacher shortage lies another story, one that suggests the problem ought to be addressed within schools as much as by external solutions. The organization of schools and how teachers are used account for a great deal of the underqualified teaching in public schools. Most policy actions, however, stress improved recruitment, teacher training, and certification requirements as the best ways to assure qualified teaching in the nation's schools.

This study focuses on one aspect of unequal distribution of quality teaching – out-of-field placement. In schools serving primarily low-income and/or minority students, out-of-field teaching is an acute problem and occurs even though the causes have little to do with the lack of certified teachers. Rather, school district policies and decisions made by school leadership often create inequalities in teaching quality within schools.

Framework for the research

Quality teaching has many dimensions, but in order to use large-scale data, this study limits the definition to teachers' education, training, and experience. Although these are indirect measures of quality, most analysts agree that they provide useful information about the chances of students to have minimally appropriate instruction.

While empirical research documents the distribution of qualified teachers within different kinds of schools, it has done little to explain why the differences exist. What is the real breadth and depth of teacher shortages? How do they impact on teacher qualifications? In what kinds of schools do they occur most frequently? What aspects of the context and organization of districts and schools relate to a school's success at providing qualified teachers for all classrooms? Because of the lack of answers, teacher policy and reform primarily have been



directed at either improving the quality of teachers or increasing their quantity. Considerable investment is being made in upgrading the preparation of teachers and in finding alternate sources for the teaching pool.

This is a “teacher deficit” perspective. The study acknowledges the problems of supply, but it adopts a different perspective. It contends that the manner in which schools are organized and teachers are used can account for as much of the problem of underqualified teaching as do inadequacies in the supply or training of teachers. Both explanations result in decreases in school performance, but the study’s approach would introduce different policies and interventions.

Out-of-field teaching is a critical reason for underqualified teaching in schools. Highly qualified teachers actually may become highly unqualified if they are assigned to teach subjects that do not match their training or education. This problem received little attention in the past because the data to document it were not available. In the early 1990s, the National Center for Education Statistics began releasing the Schools and Staffing Survey (SASS), which does reveal the extent of out-of-field teaching. The SASS data are confirmed by several other studies. All conclude that there are high levels of out-of-field teaching in American schools.

The first stage of analysis in this study describes statistically the levels of teacher education, certification, experience, and out-of-field placement and the extent to which these levels vary according to school poverty, minority enrollments, and the degree of urbanicity of the schools. To determine out-of-field teaching, the study looks at undergraduate or graduate majors or minors in five fields – general elementary education, and secondary-level mathematics, English, social studies, and science.

The second stage of analysis looks at other factors linking out-of-field teaching to demographic characteristics of the students, to the teacher deficit perspective, and to an organizational perspective.

A more advanced statistical analysis is used to analyze the association of various factors with out-of-field teaching at the secondary level, based on a sub-sample of more than 23,000 teachers in grades 7-12 (excluding those working in middle schools).

The dependent variable is the percentage of each teacher’s daily classes in which they do not have an academic or education undergraduate or graduate major or minor in the field taught. The four groups of independent variables include:

- Teacher qualifications – highest degree, years of teaching experience
- School demographics – percent low-income, percent minority, percent rural and suburban
- School recruiting and hiring difficulties – percent schools with teaching job openings, hiring difficulties
- Administration practices/organizational characteristics – major/minor required of hires, principal leadership (teacher opinions), hiring/assigning underqualified teachers (as reported by administrators), class size, starting teacher salary, percent schools with union organizing, school size.

The second stage examines the relationship between the amount of out-of-field teaching and the measures of administrative practices and organizational characteristics, while controlling for the other three independent variables. The study, which includes analysis at both the teacher level and the school level, uses a sophisticated multiple regression analysis tool.

The Results

Almost all (99 percent) of public school teachers hold a bachelor’s degree, and about half hold graduate degrees. There are some cross-school differences, however, with high-poverty schools having fewer teachers with graduate degrees. Just over one-tenth of public school teachers are beginners (three years or less), and just under one-

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third are senior (more than 20 years). In disadvantaged schools (poor/minority/urban), twice as many teachers are beginners and fewer are seniors than in advantaged schools (not poor/white/suburban). Also, while 81 percent of beginning teachers have full certificates, only 59 percent of those in disadvantaged schools have regular teaching certificates.

The most glaring source of inadequate access to qualified teachers is not the lack of basic training or certification. It is the lack of fit between teachers' preparation and their assignments. About 12 percent of those who teach regular K-6 grades do not have major or minor degrees in pre-elementary, early childhood, or elementary education, with beginning teachers more likely to be out of field. The levels of out-of-field teaching are much higher in secondary schools. About one-third of all secondary school math teachers, for example, have neither a major or minor in math or a related discipline, such as engineering or physics. Moreover, about one-fourth of English teachers have neither a major or minor in English or related subjects, and one-fifth of science and social science teachers lack a major or minor in their field. In the fields of history, English, and math, more than four million secondary students are taught by teachers with neither a major nor a minor in the field.

While misassignment occurs in advantaged secondary schools, it is a major factor in preventing access to qualified teaching for students in disadvantaged schools. Even though teachers in disadvantaged schools are only slightly more likely to have fewer qualifications, they are far more likely to be misassigned than are teachers in advantaged schools. Sometimes the extent of the out-of-field assignments is hidden in aggregate data by academic departments. An analysis of sub-field teaching shows that, for example, over half of those teaching physical science classes (chemistry, physics, earth, or space science) in disadvantaged schools are without a major or minor in any of the physical sciences. (See Table 1, page 4)

Many argue that the teacher quality problem can be solved by requiring teacher candidates to obtain more background in an academic discipline. The study points out, however, that most teachers not only have at least a bachelor's degree and a full certificate, but also have subject-area education

majors or minors. About 45 percent of out-of-field teachers hold graduate degrees in disciplines other than the subjects in which they have been assigned to teach. Yet, every year some out-of-field teaching occurs in more than half of all secondary schools, and one-fifth of the teaching force is misassigned. If the problem is not that of qualified teachers, what accounts for such high levels of out-of-field teaching?

Sources of out-of-field teaching

While the demand for teachers has increased since the mid-1980s, shortages cannot explain the high levels of out-of-field teaching in such areas as English and social studies. These fields have long had teacher surpluses. Also, even when student enrollment peaked in the mid-1990s, real shortages occurred in only about 9-16 percent of all secondary schools, depending on the subject. About half of all misassigned teachers in any given year were employed in schools that reported they had no difficulty finding qualified candidates for their job openings.

The analysis found, instead, that several aspects of schools are related to misassignment:

- Where school district policies require teachers to hold a college major or minor in the field to be taught, fewer teachers are assigned out of field.
- When teachers work in schools where principals are perceived to be good leaders (recognize good teaching, communicate well, are supportive, back teachers up), they are much less apt to be assigned out of field.
- The strategy used by administrators to cope with hiring difficulties has an effect on out-of-field teaching. Some administrators hire less than fully qualified teachers, reassign teachers trained in another field, or use substitute teachers. Other administrators opt to expand class sizes or cancel classes rather than use misassignment as a strategy.
- Neither higher teaching salaries nor the presence of a union were related to the extent of out-of-field teaching.

None of the variables significantly reduced the estimates for the effects of poverty and minority

Table 1. Percentage of public school teachers in selected field *without* a major or a minor in that field, by school type and teacher experience.

	(1) Elem.	(2) English	(3) Math	(4) Science	(5) <i>Life Science</i>	(6) <i>Physical Science</i>	(7) Social Studies	(8) <i>History</i>
Total	12.2	24.1	31.4	19.9	32.9	56.9	19.3	53.1
Poverty Enrollment								
Low	11.6	21.8	27.5	17.2	28.9	50.6	16.2	47.1
High	20.8	20.1	37.6	28.0	39.4	68.4	29.6	63.6
Minority Enrollment								
Low	8.1	21.7	27.3	17.0	32.1	55.3	18.8	55.4
High	19.5	28.5	37.8	24.6	33.6	54.2	25.5	56.8
Community								
Rural	8.3	23.1	30.2	19.5	34.1	60.2	19.5	56.8
Suburban	14.5	21.8	29.6	21.5	32.1	55.1	16.9	50.6
Urban	14.7	25.3	33.1	16.7	31.8	50.5	21.1	48.0
Not Poor/White/Suburban	13.8	-	-	-	-	-	-	-
Poor/Minority/Urban	21.3	-	-	-	-	-	-	-
Teacher's Experience								
Less than 5 years	15.2	26.1	31.7	19.7	36.1	56.8	21.3	54.8
More than 25 years	11.5	17.8	25.6	13.3	24.5	52.7	14.8	48.7

Notes:

- Column 1—Elementary includes all those teaching in the fields of prekindergarten, kindergarten or general elementary in grades K-8. It includes those teaching in self-contained classes, where the teacher teaches multiple subjects to the same class of students all or most of the day. It includes K-8 teachers employed in middle schools. It excludes departmentalized teachers who teach subject-matter courses to several classes of different students all or most of the day. Elementary teachers with a major or minor in the fields of pre-elementary, early childhood education, or elementary education are defined as in-field.
- Columns 2-7—The teaching fields of English, math, science, and social studies only include departmentalized teachers in grades 7-12. It excludes those employed in middle schools. For details on definitions of these assignment fields and the major/minors defined as in-field in each, see Ingersoll 1999 citation in full report.
- Columns 5, 6, and 8—The estimates for life science, physical science, and history represent the percentage of teachers without at least a minor in those particular subfields. For example, in science, teachers (column 4) who hold a minor in any one of the sciences are defined as in field. On the other hand, in physical science—which includes physics, chemistry, space science, and geology—teachers (column 6) must hold a minor in one of those physical sciences to be defined as in-field, rather than simply a minor in any science.
- Low poverty refers to schools where 15% or less of the students receive publicly funded free or reduced price lunches. High poverty refers to schools where over 80% do so.
- Low minority refers to schools where 15% or less of the students are minority. High minority refers to schools where over 80% are. Middle categories of poverty and minority are not shown.
- Not Poor/White/Suburban refers to schools that are low poverty and low minority and suburban.
- Poor/Minority/Urban refers to schools that are high poverty and high minority and urban.
- “-” means too few cases for reliable estimate.
- Columns 5 and 6 (life science and physical science) are subfields of Column 4 (science), and Column 8 (history) is a subfield of Column 7 (social studies).
- Data based on 1993-1994 NCES’ Schools and Staffing Survey (SASS).

enrollment. The study notes that the multivariate findings do not show causality but, rather, represent associations between particular school measures and the degree of out-of-field teaching. Moreover, the regression models account for only a portion of school-to-school differences in out-of-field teaching.

Implications

The study finds that out-of-field teaching is not primarily due to a deficit in either the quality or the quantity of teachers. Rather, it has to do with the manner in which schools are organized and teachers are assigned. Misassignment is a common administrative practice. It occurs as often as not in schools that are not having hiring problems.

Typical policies created to solve the problem of teaching quality, such as improved recruiting and preparation of teachers, are worthwhile, but they will not eliminate underqualified teaching. Focusing the blame on teachers, their preparation institutions, or demographic trends diverts attention away from the issue of how school administrators cope with staffing decisions.

The study concludes that there “is a role for managerial choice, agency, and responsibility – elements often overlooked in the educational literature on the sources of underqualified teachers.” Improving the assignment of teachers already employed in the schools could raise teacher quality as a low-cost alternative to other strategies now being used. On the other hand, some of the current reform strategies, such as smaller classes and smaller schools, might work against efforts to reduce out-of-field teaching. School administrators face difficult trade-offs and tough choices.

Future research

Field observations are needed to understand the processes behind school staffing. They might answer: What are the hidden incentives used in making staffing decisions? How do certain teachers wind up with certain classes? How do these factors and others lead to misassignment of teachers? The study also calls for macro-level research on historical and comparative contexts, such as the influence on the accepted practice of out-of-field assignments due to the traditional low status given to teaching.



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