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# Out-of-Field Teaching and the Limits of Teacher Policy

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# Out-of-Field Teaching and the Limits of Teacher Policy

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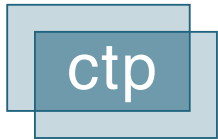
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University of Pennsylvania

**September 2003**  
*(Document R-03-5)*



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## ABSTRACT

The failure to ensure that the nation's classrooms are all staffed with qualified teachers is one of the most important problems in contemporary American education. Over the past decade, many panels, commissions, and studies have focused attention on this problem and, in turn, numerous reforms have been initiated to upgrade the quality and quantity of the teaching force. This report focuses on the problem of underqualified teachers in the core academic fields at the 7-12<sup>th</sup> grade level. Using data from the nationally representative Schools and Staffing Survey, conducted by the National Center for Education Statistics, this analysis examined how many classes are not staffed by minimally qualified teachers, and to what extent these levels have changed in recent years. The data show that while almost all teachers hold at least basic qualifications, there are high levels of out-of-field teaching—teachers assigned to teach subjects that do not match their training or education. Moreover, the data show that out-of-field teaching has gotten slightly worse in recent years, despite a plethora of reforms targeted to improving teacher quality. The report discusses possible reasons for the failure of these reform efforts. My thesis is that, despite the unprecedented interest in and awareness of this problem, there remains little understanding of a key issue—the reasons for the prevalence of underqualified teaching in American schools—resulting thus far in a failure of teacher policy and reform. I conclude by drawing out the lessons and implications of these failures for the prospects of the No Child Left Behind Act to successfully address the problem of underqualified teachers in classrooms in the coming years.



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## INTRODUCTION

Over the past decade, dozens of studies, commissions, and national reports have bemoaned the qualifications and quality of our teachers. As a result, reformers in many states have pushed tougher teacher education and certification standards in an attempt to ensure that our nation's elementary and secondary classrooms are all staffed with qualified teachers. Moreover, a whole host of initiatives and programs have sprung up which are designed to recruit new and talented candidates into teaching. Concern with the quality and qualifications of teachers is neither unique nor surprising. Elementary and secondary schooling are mandatory in the U.S., and it is into the custody of teachers that children are legally placed for a significant portion of their lives. The quality of teachers and teaching are undoubtedly among the most important factors shaping the learning and growth of students. Moreover, the largest single component of the cost of education in any country is teacher compensation.

However, although ensuring that our nation's classrooms are all staffed with qualified teachers is a perennially important issue in our schools, it is also among the least understood, especially in regard to the sources of the problem. One of the least recognized of these sources is the phenomenon known as out-of-field teaching—teachers assigned to teach subjects which do not match their training or education. This is a crucial factor because highly qualified teachers may actually become highly unqualified if they are assigned to teach subjects for which they have little background. Educators have, of course, long been aware of the existence of out-of-field teaching. James Conant, former President of Harvard University and father of the SAT, called attention to the widespread “misuse of teachers” through out-of-field assignments in his landmark 1963 study *The Education of American Teachers*. Albert Shanker, the former head of the American Federation of Teachers, condemned out-of-field teaching as education's “dirty little secret” in a 1985 opinion piece in the *New York Times*. But, an absence of accurate statistics on out-of-field teaching has kept this problem largely unrecognized—a situation remedied with the release, beginning in the late 1980s, of the Schools and Staffing Survey (SASS) a major new survey of the nation's elementary and secondary teachers conducted by the National Center for Education Statistics (NCES) of the U.S. Department of Education.

In previous research using the SASS data, I have shown that out-of-field teaching is a serious problem across the nation (Ingersoll, 1999, 2002a). These findings on out-of-field teaching have been replicated. Several other researchers have calculated levels of out-of-field teaching using the same, or similar, data sources and, although different analysts have focused on a wide range of different measures of out-of-field teaching, all have reached the same conclusion—that high levels of out-of-field teaching are a leading source of underqualified teaching in American schools (see, e.g., Bobbitt & McMillen 1995; Bandeira de Mello & Broughman 1996; Smerdon et al. 1999; McMillen et al. 2002).

The findings of this research have captured widespread interest, been featured in a number of major education reports (e.g., National Commission on Teaching and America's Future 1996, 1997; Education Week 1997, 1998, 2000, 2003; Education Trust 1996, 1998), and been widely reported in the national media. As a result, over the past several years the problem of out-of-field teaching has become a major concern in the realm of educational policy and its elimination a target of reform legislation.

The analysis in this report seeks to build on, and update with more recent data, this earlier work. It specifically examines the past decade's trends in out-of-field teaching for both the nation and the 50 states. The first section of this report begins by summarizing the kinds of teacher quality reforms that have been implemented since the mid 1990s, both at the federal and state levels. After describing the SASS database and measures of out-of-field teaching in more detail, I then present data

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from the period 1987 to 2000 showing how much out-of-field teaching has existed, to what extent it varies across different subjects, and across different kinds of schools, and, most important, to what extent levels of out-of-field teaching have, or have not, decreased during these years. The data show that while almost all teachers hold at least basic qualifications (i.e. a bachelor's degree and a full teaching certificate), there are large numbers of classes staffed by out-of-field teachers. Moreover, perhaps surprisingly, the data show that there was little decrease in the amount of out-of-field teaching during this period, despite the implementation of numerous policy reform efforts. The following section turns to a discussion of possible reasons for the failure of teacher quality reform. My thesis is that, despite the unprecedented interest in, and awareness of this problem, there remains little understanding of a key issue—the reasons for the prevalence of out-of-field teaching in American schools—and that this lack of understanding has undermined recent reform efforts. I conclude by drawing out the lessons and implications of these failures for the prospects of current and future legislation, such as the No Child Left Behind Act, to successfully address the problem of underqualified teachers in classrooms in the coming years.

## FEDERAL TEACHER QUALITY POLICY

Most recent federal and state teacher policies and initiatives have focused on two general approaches to trying to ensure that all classrooms are staffed with qualified teachers: upgrading the qualifications of teachers; and increasing the quantity of teachers supplied. Though the responsibility of teacher preparation, credentialing, hiring and other teacher functions related to K-12 education lies with states and school districts, the federal government has increasingly been involved in efforts to increase the quality and quantity of teachers over the past decade (Stedman 2002).

Prior to the late 1990s, federal aid for K-12 teaching focused largely on in-service training and professional development of existing teachers through programs such as the Eisenhower Professional Development program, which provides support for the development of effective teaching practices in reading, mathematics, and science. The legislative work of the 105<sup>th</sup> Congress (during 1997-98) undertook a shift in focus to pre-service training and teacher recruitment. In particular, the Higher Education Act (HEA) included amendments for providing funds for various initiatives through the Teacher Quality Enhancement Program. This program provided grants to develop comprehensive statewide reforms to improve teacher quality, partnerships aimed at improving higher education's teacher preparation programs, and teacher recruitment efforts to help reduce shortages of teachers in high-need schools.

A significant component of the amendments to HEA was the inclusion of an accountability requirement for teacher preparation programs. The Act required higher education teacher preparation programs to report various indicators, including graduate pass rates on state certification tests. The Act required states to establish procedures for identifying low-performing teacher preparation programs. Low-performing preparation programs could be denied federal professional development funding.

An additional focus of the 105<sup>th</sup> Congress was the reduction of class size. The Class Size Reduction Program provided funding to recruit new, qualified teachers. In its efforts to reduce class size, Congress allocated over four billion dollars for the hiring of teachers between the fiscal years of 1999 and 2001. School districts receiving funds from the Class Size Reduction Program were encouraged to integrate this funding with funding from other initiatives such as the Eisenhower Program. Until the enactment of the No Child Left Behind Act in 2002, the Class Size Reduction Program and the Eisenhower Program were the two largest federal initiatives supporting teachers in K-12 education.

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The 106<sup>th</sup> Congress (1999-2000) continued the federal emphasis on improving teacher quality by specifying how funds for the Eisenhower Program were to be used. Congress specified that funding be spent on initiatives and/or activities which would work towards reducing the number of teachers without certification, teaching out-of-field, and/or lacking subject-matter knowledge. Eisenhower Program funding could be utilized for activities such as the mentoring of new teachers, professional development, and towards efforts to retain teachers who had demonstrated effectiveness in increasing the achievement of low-income students. In addition, funding was appropriated for teacher recruitment efforts targeting mid-career professionals in non-teaching occupations as well as recent college graduates with bachelor's degrees in fields other than education. The 106<sup>th</sup> Congress also established the Troops-to-Teachers Program for supporting the entry of former military personnel into the teaching occupation.

These initiatives were expanded by the 107<sup>th</sup> Congress (2001-2002), culminating in the re-authorization in January 2002 of the Elementary and Secondary Education Act—entitled the “No Child Left Behind Act.” This legislation set a new, unprecedented and laudable goal: to ensure that the nation’s public elementary and secondary students are all taught by highly qualified teachers by the end of the 2005-2006 school year.

In general, the NCLB Act defines a “highly qualified” teacher as someone who has a bachelor’s degree, who holds a regular or full state-approved teaching certificate or license and who is competent in each of the academic subjects they teach. There are several means by which teachers can establish “competency” in a subject: they can hold an undergraduate or graduate major or its equivalent in the subject, pass a test on the subject, hold an advanced teaching certificate in the subject, or meet some other state-approved method of evaluation for the subject. In order to assess how well schools are doing in regard to the new requirements and to hold them accountable if they do not meet them, the new law requires three things of states and school districts: annual report cards; plans for improvement; and disclosure to parents of students taught by underqualified teachers.

## **STATE TEACHER QUALITY POLICY**

Over the past several years, many states have developed and implemented policies designed to increase the quality and quantity of their teachers. To address the teacher shortages “crisis” many states have developed strategies to recruit new teachers. These include alternative certification pathways, some of which target minorities and mid-career professionals. The degree of training provided by these programs varies. Other strategies include the removal of barriers to migration by individuals who are currently teachers, such as easing requirements for granting reciprocity for teachers certified in other states and streamlining the hiring process. Others are less conventional, such as programs that recruit future teachers at high schools and those that encourage retired teachers to return to teaching by offering creative financial/pension plans. Some states have developed programs that offer financial incentives for positions, such as mathematics and science instructors, which have been identified as being areas of high-need. Partnerships between teacher preparation programs and school districts have also been created as a means for recruiting new teachers into high-need districts and schools (Education Commission of the States, 2003).

Compensation is often a component of states’ strategies for recruiting teachers. These include financial incentives such as signing bonuses, student loan forgiveness, housing assistance, and tuition reimbursement. Some states have also increased salaries for existing teachers in an attempt to retain and discourage teachers from transferring to other states which may have higher salaries for those with comparable experience. As in the past, some states have attempted to link teacher salaries to performance and

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“merit”—using outcomes such as increased teacher knowledge, student achievement, and student attendance. A more common approach used by many states is the offering of incentives for teachers to obtain National Board Certification. Financial incentives were offered by 68% of the states, while incentives related to certification were made available by 54% of the states (Education Week, 2000).

In addition to strategies based on compensation, induction programs have become more widespread in recent years as a strategy for both recruiting new candidates and in reducing their turnover in the initial years of their career. As of 1999, 38 states had established programs of support for new teachers (Hirsch et al. 2001). However, many of these induction programs are not funded by the states themselves; funded was provided by 32% of states in 1996 and by only 30% in 2000.

Parallel to the effort to develop, implement, and assess the degree to which students are meeting rigorous state standards, many states have also developed new standards for teachers. Over the past several years, state legislatures have strengthened certification processes and implemented teacher assessment systems designed to measure content knowledge in the subject areas of an individual’s certification. Many states have established or expanded their tiered certification systems which provide “initial” or “provisional,” “professional,” and “master teacher” licenses. In such systems, teachers are expected to increasingly develop knowledge and skills related to teaching. Despite such efforts, a paradox exists in that many states are continuing to pass legislation that waives requirements to meet certification criteria, while at the same time developing more rigorous certification criteria.

In 1997, the percentage of states that had developed an assessment for new teachers was only 16%. Examples of performance assessment in use included local team evaluations, classroom observations, videotaped lessons, and portfolios. However, by 2000, 74% of states required written tests of basic skills for those teachers entering the profession, 58% had tests of content knowledge, while 48% had written tests for subject-specific pedagogy (Education Week 2000).

Some states have also considered the problem of what to do with existing teachers who do not meet qualification standards. Some states have increased the length of probationary periods so that more time is provided to evaluate the performance of new teachers. Others have attempted to eliminate tenure or change regulations so that teachers can be more easily dismissed for unsatisfactory job performance. But by 2000, less than 10% of states had developed performance assessments as a requirement for second-stage certification.

Rather than relying solely on strengthened certification and/or licensure requirements for teachers, several state legislatures have also focused on the creation of performance-based teacher training program standards. Some recent policies have placed an emphasis on accountability requirements for teacher preparation programs. The primary vehicle by which this is being accomplished is through competency testing of program graduates. While many states are now administering tests to new teachers as a condition of certification, few states reported actually using this information for the purposes of teacher preparation program accountability. As of 2000, only seven states (14%) had developed a mechanism for holding teacher-training programs accountable for their graduate’s scores on these tests (Education Week, 2000). Finally, in recent years, some states have identified areas of need and targeted professional development to certain content areas or grade levels. In 1997, 82% of states had state-funded professional development; by 2000 this increased to 88% (Education Week, 1997/2000).

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The question of interest here is—have any of these reforms had an impact on the problem of ensuring that our nation’s elementary and secondary classrooms are all staffed with qualified teachers? Before addressing this question, I first turn to a discussion of the data, methods, and measures used in this analysis.

## **DATA AND METHODS**

### **Data**

As mentioned earlier, the data for this analysis come from NCES’ Schools and Staffing Survey. This is the largest and most comprehensive data set available on the staffing, occupational, and organizational characteristics of elementary and secondary schools. The survey was specifically designed to remedy the lack of nationally representative and comprehensive data on these issues (Haggstrom, Darling-Hammond, & Grissmer, 1988).

The U.S. Census Bureau collects the SASS data for NCES from random samples stratified by state, sector, and school level. To date, four independent cycles of SASS have been completed: 1987-1988, 1990-1991, 1993-1994 and 1999-2000 (for information on SASS, see Choy et al., 1993 or Henke et al., 1997). Each cycle of SASS includes several sets of separate, but linked, questionnaires for school administrators and for a random sample of teachers within each school. The response rate has been relatively high: about 85% for teachers and 95% for administrators.

SASS is a large survey; in each cycle, the sample sizes are about 5,000 school districts, 11,000 schools and 53,000 teachers. It is also a comprehensive survey; it provides accurate data for all 50 states (and DC) and all types of schools. Throughout, this analysis uses data weighted to compensate for the over- and under-sampling of the complex stratified survey design. Each observation is weighted by the inverse of its probability of selection in order to obtain unbiased estimates of population parameters.

### **Measuring Out-of-Field Teaching**

Empirical research on the extent of underqualified and out-of-field teaching has faced serious problems surrounding the validity of both data and methods, and these issues warrant some extended discussion here. In the first place, out-of-field teaching is politically sensitive—something that will most likely increase with the new requirements of NCLB. Hence, researchers have often been skeptical of data on out-of-field assignments obtained from local or state school officials (Robinson 1985; Haggstrom et al. 1988, p 52).<sup>1</sup> One of the strengths of the SASS data on out-of-field teaching is that it is not obtained from school officials, nor is it obtained by asking teachers themselves if they are assigned to teach out of their field. SASS collects extensive information on both the daily course schedules and the education, training, and certification from its very large nationally representative sample of teachers. From these data, I independently calculate the amount of out-of-field teaching.

Empirical measurement of the extent of underqualified teaching is also difficult because there is little consensus and much debate over how to define a “qualified teacher” Although there is almost universal agreement that teachers do matter and that student learning is affected by the quality of teaching, there is a great deal of controversy concerning which kind of courses, training experiences, and credentials teachers ought to have to be considered adequately qualified.

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One of the key areas of difference concerns the relative value for teachers of subject-matter knowledge and pedagogical knowledge. On one end of this continuum, are those who argue that content or subject knowledge—knowing what to teach—is of primary importance for a qualified teacher. At its extreme this viewpoint assumes that training in teaching methods is unnecessary and that having an academic degree in a subject is sufficient to be a qualified teacher in that subject. On the other end of this continuum are those who argue pedagogical or methodological knowledge—knowing how to teach—is of primary importance to be qualified. In this view, in-depth knowledge of a subject is less important than in-depth skill at teaching. At its extreme, this viewpoint holds that “a good teacher can teach anything.”

Teaching does have an extensive body of empirical research, going back decades, devoted to assessing the effects of various teacher qualifications on teacher and student performance. For measures of qualifications, researchers typically examine teachers’ test scores or teacher credentials, such as a degree or a teaching certificate, reflecting a variety of types of teacher education and training. And there are a number of studies that have found teacher education or training, of one sort or another, to be significantly related to increases in student achievement. For example, in a review of 60 empirical studies on the effects of teaching education, Greenwald et al. (1996) concluded that teachers’ degree levels consistently showed “very strong relations with student achievement” . . . in “a wide variety of studies over a three decade period” (284-5). Some studies look closely at the amount of subject-specific teacher education. For example, in a recent multilevel analysis of NAEP data, Raudenbush et al. (1999) found teacher education in math (as measured by a major in math itself) to be highly related to the math proficiency of students.

But, the results from this literature are often contradictory, and there are also studies showing no positive effects of for various measures of teacher qualifications. Given the inherent difficulties in accurately isolating and capturing the effects of teachers’ qualifications on their students’ achievement and the weaknesses of much of the extant data and empirical research, this is not surprising. More and better teacher effects research is warranted to clarify some of the resulting uncertainties, and many have called for more such empirical studies. But others have argued that in the absence of solid documentation of their value, teacher training and licensing are unnecessary and burdensome barriers to the entry of willing candidates into the teaching occupation. Proponents of this viewpoint often call for the elimination of one aspect or another of teaching training and certification requirements.

This stands in stark contrast to the situation in a number of other developed nations: recent cross-national data indicate that the entry requirements to becoming a teacher in the U.S. are less rigorous, less arduous, and less lengthy than those in many other countries (Wang et al. 2003). It is also important to recognize that the argument that teacher training is an undue barrier to occupational entry stands in contrast to the perspective long held by organization theorists and among those who study work, organizations, and occupations in general. From a cross-occupational perspective, teaching has long been characterized as an easy-in / easy-out occupation. Compared to many other occupations, and in particular compared to the traditional professions, teaching has a relatively low entry bar and a relatively wide entry gate. Becoming a professor, lawyer, accountant, architect, or engineer, for instance, involves far more preparation and education than does becoming an elementary or secondary level teacher. The ostensible rationale for these relatively low entry requirements is that teaching is assumed less complex, requiring less ability and training than many other occupations and professions. But, analysts of work and occupations have traditionally classified teaching as a relatively complex form of work, characterized by uncertainty, intangibility, and ambiguity, and requiring as high a degree of initiative, thought,

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judgment, and skill as do some of the traditional professions (e.g., Bidwell 1965; Lortie 1975; Kohn & Schooler, 1983).

Ironically, although the entry training and licensing requirements are lower for teaching than for many other occupations and lower than in some other nations, there appears to have been relatively greater effort expended to evaluate and scrutinize whether these requirements are useful or necessary. In a preliminary search I have been unable to find analogous evaluative and effects literature for other occupations and professions. To be sure, there does appear to be interest in determining the best form of preparation of, for example, veterinarians, accountants, or lawyers. But, I have failed to find much debate over whether advanced training and education are themselves necessary for these jobs. For example, there does not appear to be a “professor effects” literature that examines whether professors’ qualifications have a positive effect on student achievement or on research productivity (for a review of this literature, see, e.g., Pascarella & Terenzini 1991). Nevertheless almost all universities require a doctorate for academic positions.

This lack of consensus on how to define a qualified teacher has implications for research on out-of-field teaching—that is, how to define whether someone is qualified in the actual fields and subjects they are assigned to teach. Just as a qualified/unqualified teacher can be defined and measured in a number of ways, so can an in-field/out-of-field teacher. And just as all of the definitions of a qualified/unqualified teacher have weaknesses and are the source of much contention, the same applies to measures of in-field/out-of-field teaching. Those of us who do this research have developed over a dozen different measures of out-of-field teaching. They vary according to how high a standard they set—some include anyone with an undergraduate minor in the field; others only count those with both a full degree and a certificate in the field. Measures also vary depending upon whether they focus on the numbers of teachers doing it, or on the numbers of students exposed to it, according to which fields and subjects they examine, and according to which school grade levels are included. These choices are consequential; each of the many different measures also has its own advantages and disadvantages, strengths and weaknesses. (For detailed discussion and comparison, see Ingersoll 1996, 2002b.)

One of the standard methods by which school officials attempt to assess both teachers’ educational and pedagogic qualifications in specific fields is to screen teachers’ scores in field-specific examinations, such as the National Teacher Examination or the Praxis series of exams. The use of teachers’ test scores could be a valuable means of assessing out-of-field teaching. But as of yet, there is no national database with data on both teachers’ courseloads and teacher test scores in all of the subjects they teach. With the passage of the NCLB, such helpful data may become available.

Another possible method of assessing teachers’ educational preparation in a field is to count the actual number of undergraduate or graduate courses completed in that field. But counting courses is problematic. Analysts at NCES have found that, absent an analysis of actual course transcripts, teachers find it very difficult to accurately recollect the exact number of credits they completed in different subjects (Chaney, 1994).

Perhaps a less precise but more reliable indicator of qualified teachers than test scores or course counts is whether teachers have a credential, such as a college degree or teaching certificate, in the fields they teach. School officials decide whether a candidate is qualified to teach a particular subject if a teacher has a teaching certificate or license in that field. Such data are available in SASS, and I will use this measure here. But, it is necessary to recognize that the value of certification as an indicator of a qualified teacher is, however, one of the issues most hotly debated. The kinds of certification provided, the rigor of teacher certification requirements, and the quality of teacher

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training programs all vary widely across states (Tryneski, 1997). There is, for instance, heated controversy over whether teacher certification should or should not require a major or a minor in an academic discipline, rather than simply an education degree.

My primary focus here and a credential-type measure that has been widely used in this kind of research is whether teachers have an undergraduate or graduate major or minor in the fields they teach. As defined here, this measure represents a minimal prerequisite—of all those who teach in a particular field, how many do not have at least a minor in that or a related field. This measure counts both academic *and* education majors and minors (e.g., a math teacher with a minor or major in either math or in math education is counted as in-field). Hence, it captures a mix of both subject and pedagogical knowledge in its definition of an in-field teacher—something often missed by observers who often have wrongly assumed that this measure of out-of-field teaching refers solely to a lack of subject knowledge in a field.

For all of the measures of out-of-field teaching, I will focus on departmentalized, that is, subject-area teachers, in the four core academic subjects—math, English, science and social studies. Chart 1 shows which certification, major, or minor fields I count as qualified for each assignment field. Parallel to the standard set by NCLB, I focus upon an expanded definition of “secondary” to include all core academic teachers in 7<sup>th</sup> through 12<sup>th</sup> grades, regardless of whether they were employed in middle schools, junior high schools, senior high schools, secondary schools, or combined schools.

As mentioned above, measures of out-of-field teaching also vary depending upon whether they focus on the numbers of individuals teaching out of their fields, or by the numbers of students or classes taught by an out-of-field teacher. The first of these choices, teachers who are out of field, is most frequently used because interest in out-of-field teaching has arisen in a context of research and policy focused on problems of teacher supply, demand, and quality. This type of measure is also useful to those concerned with the characteristics of the teaching force and those who want to know what portion of the teaching force is not qualified in their assigned fields. But, it does not distinguish, nor weight, the amount of out-of-field teaching each teacher does. This type of measure counts teachers as out of field whether they teach only one class out of field or five classes out of field. Because, the data show that the former is more likely the case than the latter, counting all teachers overestimates the overall amount of underqualified teaching in classrooms.

For this reason, a second type of measure is useful: the percentage of teachers’ total classes taught for which they do not have a particular credential. This measure indicates the proportion of classes offered in schools that are taught by out-of-field teachers. Here I will use both types of measures.

Measures of out-of-field teaching that focus upon teachers’ credentials are based on several related assumptions and it is useful to explicitly recognize these upfront. The assumption underlying this research is that adequately qualified teachers, especially at the secondary school level and especially in the core academic fields, ought to have, as a minimum prerequisite, at least a college minor or a certificate in the subjects they teach. Of course, not all individuals need such a credential to be a quality teacher. There are, no doubt some gifted individuals able to teach anything well, regardless of their educational background and preparation. On the other hand, having such a credential, of course, does not guarantee quality teaching, nor even a qualified teacher. There are, of course, no doubt some individuals who are unable to teach anything well, regardless of how many degrees they have.

My assumption is that being adequately qualified at the secondary-level requires *at a minimum* preparation in how to teach, preparation in the particular subjects one

**Chart 1. Matching Teaching Fields with Training Fields**

I. Teaching Fields	II. Teachers' Course Assignment Fields	III. Teachers' Major or Minor Fields	IV. Teachers' Certification Fields
English	literature composition/journalism/creative writing reading other English/language arts courses	communications or journalism English English educ./language arts educ. literature reading education	English or language arts Journalism Reading
mathematics	general mathematics business math algebra, elementary algebra, intermediate algebra, advanced geometry, plane/solid trigonometry analytical geometry probability/statistics calculus other mathematics	engineering mathematics mathematics education physics statistics	Mathematics
social studies	social studies history world civilization political science/government geography economics civics sociology/social organization other social science psychology	psychology public administration social studies/social sciences educ. economics history political science sociology other social sciences other area or ethnic studies American Indian studies	social studies or social sciences history
<i>history</i>	history world civilization	history	social studies/social sciences history
science	general science biology/life science chemistry physics geology/earth science/space science other physical science other natural science	science education biology/life science chemistry earth science/geology physics other natural sciences engineering	general science biology/life science chemistry earth science/geology physics other natural sciences physical science
<i>life science</i>	biology/life science	biology/life science	biology/life science
<i>physical science</i>	chemistry physics geology/earth science/space science other physical science	earth science/geology physics chemistry engineering	chemistry physics geology/earth science/ space science physical science

is assigned to teach, and also preparation in how to teach particular subjects—a form of subject-specific pedagogy—akin to what Shulman (1986) has called pedagogical content knowledge. On the one hand, simply knowing a subject well is rarely enough. One, for example could have a Ph.D. in math, but not have a clue as to how to effectively teach decimals to 9<sup>th</sup> graders. On the other hand, general pedagogical skill is rarely enough. It is very difficult, challenging and time consuming to teach subjects that one does not know very well—something I found in my former experiences as a secondary-school teacher where I was often assigned by my school principal to teach subjects for

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which I had very little background. Hence, my assumption is that for most teachers it is difficult, at best, to teach well what one does not know well. That is, I assume that education and training do impart knowledge, and that teachers trained, for example, in how to teach social studies are unlikely to have a solid understanding of how to teach physics. In short, I assume that few parents would expect their teenagers to be taught, for example, 11<sup>th</sup> grade trigonometry by a teacher who did not have some background in math or a related subject, no matter how bright the teacher. The data show, however, there are millions of teenagers so taught each year.

## HOW WIDESPREAD IS OUT-OF-FIELD TEACHING?

As shown in Table 1, in the 1999-2000 school year 38% of all 7-12<sup>th</sup> grade school teachers who taught one or more *math* classes did not have either a major or a minor in math, math education, or related disciplines like engineering, statistics or physics. About one third of all 7-12<sup>th</sup> grade teachers who taught one or more *English* classes had neither a major or minor in English or related subjects such as literature, communications, speech, journalism, English education, or reading education. In *science*, slightly lower levels—about 28% of all 7-12<sup>th</sup> teachers who taught one or more science classes—did not have at least a minor in one of the sciences or in science education. Finally, about a quarter of those who taught one or more *social studies* classes were without at least a minor in any of the social sciences, in public affairs, in social studies education, or in history.

Whether I examined teachers without a major or minor or teachers without certification in their assigned fields the numbers were similarly alarming. I found, for example, that almost a third of public 7-12<sup>th</sup> math teachers did not have regular or full teaching certificates in math. (see Figure 1).<sup>2</sup> But, focusing on those without certificates can lead one to underestimate the amount of underqualified teaching within broad multi-disciplinarian fields, such as science and social studies. Teachers in these fields are routinely required to teach any of a wide array of subjects within the department. Simply having a certificate in these fields, however, may not mean teachers are qualified to teach all of the subjects within the field. For example, a teacher with a degree in biology and a certificate in science may not be qualified to teach physics. Indeed, when I raised the standard for a qualified teacher within science and social studies to a major or minor in the subfield taught, I found high levels of within-department but out-of-field teaching. For example, as shown in Table 1, 60% of those teaching physical science classes (chemistry, physics, earth or space science) were without a major or minor in any of the physical sciences. Likewise, well over half of all those teaching history were without a major or minor in history itself.

Several points and limitations must be stressed concerning these measures and data. First, there is no doubt some of these out-of-field teachers may actually have been qualified, despite not having a minor or major or certificate in the subject. Some might have been qualified by virtue of knowledge gained through previous jobs, through life experiences or through informal training. Others may have completed substantial college coursework in a field, but not have gotten a credential.

Moreover, out-of-field teaching is not the norm for most teachers and the data show that almost none are teaching out of their fields for all of their class load. Most 7-12<sup>th</sup> grade subject-area teachers have a main field or a primary department in which they teach and most do have either a certificate or a degree in this main field. But many of these teachers are also assigned to teach some classes each day in other fields or departments. Mathematics teachers, for example, may not simply teach math;

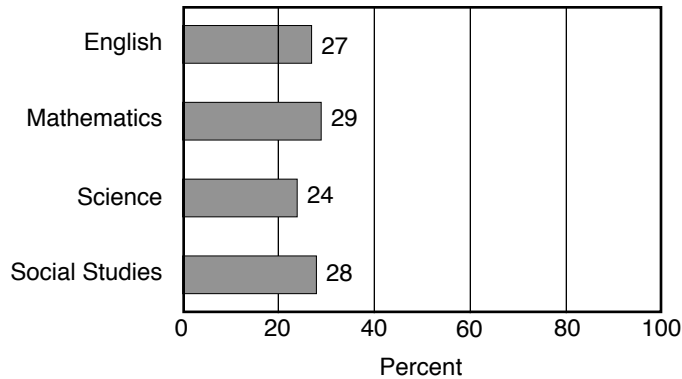
**Table 1. Percentage of Grades 7-12 Teachers in the Core Academic Fields Without A Major or Minor in The Field, 1999-2000.**

	English	Math	Science	<i>Life Science</i>	<i>Physical Science</i>	Social Studies	<i>History</i>
<b>U.S. Total</b>	<b>34.5</b>	<b>37.9</b>	<b>27.6</b>	<b>45.2</b>	<b>59.9</b>	<b>25.6</b>	<b>57.5</b>
<b>Public Total</b>	<b>33.1</b>	<b>35.8</b>	<b>26.5</b>	<b>42.7</b>	<b>59.1</b>	<b>25</b>	<b>58.5</b>
School Poverty							
Low Poverty	24	30	20.3	40.4	51.4	16.9	50
High Poverty	41.7	51.4	32	41.2	64	31.9	61.2
School Size							
Small	33.6	41.4	30.2	48.8	64.3	26.5	63.9
Large	27	30	22.4	38.5	53.2	21.8	56
Grade Level							
7-8 <sup>th</sup> Grades	43.3	52.7	39.5	59.2	82.3	34.9	61
9-12 <sup>th</sup> Grades	23.7	27.9	19.8	36.8	51.4	20.5	57.7
<b>Private Total</b>	<b>41.8</b>	<b>48.8</b>	<b>32.7</b>	<b>54.2</b>	<b>60.1</b>	<b>29.3</b>	<b>52.5</b>
Orientation							
Catholic	39.8	42.5	31.2	54.3	51.6	30.5	47.7
Other Religious	46	57.8	39.8	54.7	68.7	31.4	57.8
Non-sectarian	39.4	45.9	25.5	53.6	56.1	24.8	53.2
School Size							
Small	56.7	60.1	39.4	61.1	66.2	41.3	66.5
Large	9.2	11	10.0	24	28.3	5.6	30.3
Grade Level							
7-8 <sup>th</sup> Grades	60	64.7	54	70	83.9	43	63.7
9-12 <sup>th</sup> Grades	29.9	39.4	21.8	45.7	48.2	20.6	46.7

**Notes:**

- The teaching fields of English, math, science and social studies only include departmentalized teachers in grades 7-12. It includes those employed in middle schools.
- 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 3) who hold a minor in any one of the sciences are defined as in-field. On the other hand, in physical science, teachers (column 5) - which includes physics, chemistry, space science and geology - 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.
- Small schools are those with fewer than 300 students. Large schools are those with 1000 or more students.
- Middle categories of poverty and size are not shown.

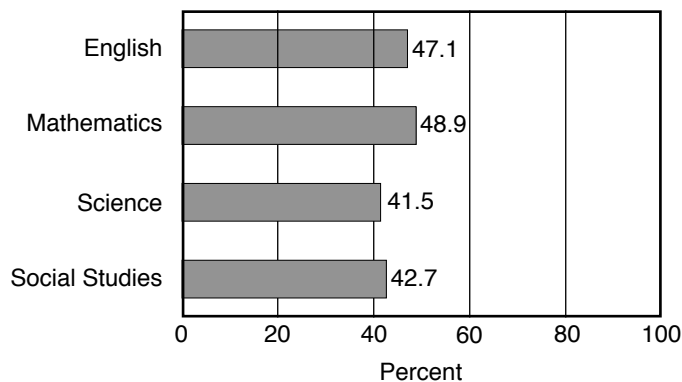
**Figure 1. Percent of Public Grade 7-12 Teachers in the Core Academic Fields without Regular Certification in the Field, 1999-2000.**



they may also be assigned to teach biology for part of the day. It is in these other assignments that teachers most often have little background.

But recall that my initial assumption and premise, as earlier outlined in the methods section, was that having a college minor is a *minimal* prerequisite. From this perspective, even a moderate number of teachers failing to meet such a low bar signals the existence of serious problems in our schools. The data clearly indicate that this is the case. Different measures show different levels of this problem, but the data reveal that out-of-field teaching is widespread no matter how it is defined. Indeed, when I upgraded the definition of a “qualified” teacher, for instance, to include only those who held *both* a college major and a teaching certificate in the field, the amount of out-of-field teaching substantially increased. For instance, as illustrated in Figure 2 almost half of those who taught math did not have both a major and a full certificate in math. This is an important finding because it reflects the primary definition of “highly qualified” embedded in NCLB. Finally, it is important to also note that the actual numbers of students affected are not trivial. For example, in each of the fields of English and math and history, in 1999-2000 well over four million 7-12<sup>th</sup> grade level students were taught by teachers with neither a major nor a minor in the field taught.

**Figure 2. Percent of Public Grade 7-12 Teachers in the Core Academic Fields who Lack Either a Major or Full Certification or Both in the Field, 1999-2000.**



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## DO SCHOOLS VARY IN THEIR LEVELS OF OUT-OF-FIELD TEACHING?

The data also show that there are striking differences in the amount of out-of-field teaching across different types of schools. It is widely believed that the most needy students in the U.S.—those from poor and low-income communities—are often taught by the least qualified teachers. This, of course, is held up as a major reason why such students often perform poorly in educational assessments (e.g., Darling-Hammond, 1987; Kozol, 1991; Oakes, 1990; Haycock, 1998, 2000). The data show that, indeed, school poverty levels were clearly associated to the amount of out-of-field teaching. That is, in most fields, teachers in high-poverty schools were more likely to be out-of-field than are teachers in more affluent schools. For example, almost a third of social studies teachers in high-poverty schools, as opposed to 17% in low-poverty schools, did not have at least a minor in social studies or related disciplines (see Table 1).

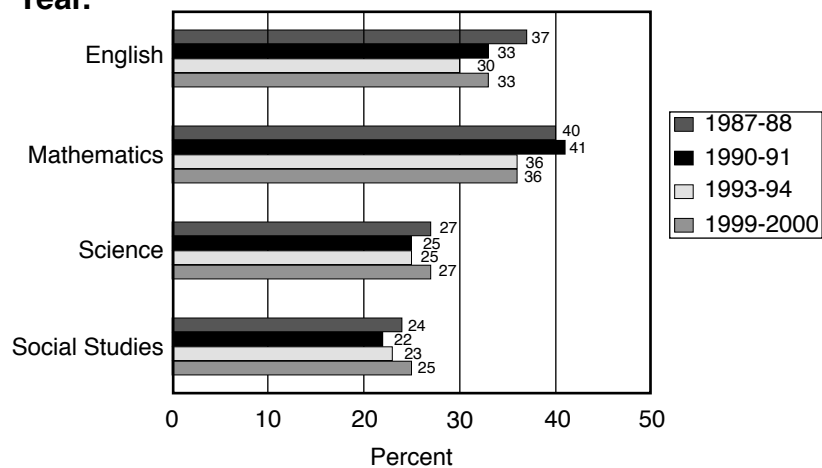
But, more affluent schools are, by no means, free of out-of-field teaching, and interestingly, school poverty is not the only, nor even the most important, school characteristic related to the degree of out-of-field teaching. School sector and school size are also important sources of variation for out-of-field teaching. Small schools (less than 300 students) have higher levels of out-of-field teaching in each of the core academic fields than do larger schools (1,000 or more). This gap is especially striking in the private sector. Private schools appear to have both the highest and lowest levels of out-of-field teaching. On the one hand, large private schools have unusually low overall levels of out-of-field teaching. On the other hand, small private schools have among the highest overall levels of out-of-field teaching. It must also be noted that large private schools account for less than 10% of 7-12<sup>th</sup> level private school teachers, while small private schools account for 47% of these teachers, and 80% of these private schools. This suggests there is a large degree of diversity, at least in regards to teacher qualifications, in the private sector—something often overlooked in the ongoing debate over public versus private schooling. Moreover, the finding that school size is related to the extent of underqualified teaching raises questions for the “small is beautiful” notion that is currently popular among many education researchers and policy-makers. In this view large schools are more impersonal, alienated, inflexible, and bureaucratic and, hence, have less sense of cohesion, belongingness, and community. The conclusion, from this viewpoint, is that large schools are less effective places for students to learn and grow (for a review, see Bryk et al. 1990). These data suggest, however, that one possible disadvantage of smaller schools, often overlooked in the debates over the relative merits of small and large, is a greater degree of underqualified teaching. Small schools may find it more difficult to allow staff specialization, and, as a result, teachers in these schools are more often required to be generalists, regardless of their background and training.

The data also show that the problem of out-of-field teaching is worse in the 7<sup>th</sup> and 8<sup>th</sup> grades than in 9<sup>th</sup> through 12<sup>th</sup> grades. This is probably due to the fact that many 7-8<sup>th</sup> grade teachers are employed in middle schools. Some states require middle school teachers to hold an elementary-school-type certificate that emphasizes a broad background and does not require substantial specialization in any one academic subject. This may be adequate preparation for those teaching in elementary self-contained classes, where the teacher teaches multiple subjects to the same class of students all or most of the day. But in some middle schools such teachers may be assigned to teach subject-matter courses to classes of different students all of most of the day, as if they are departmentalized secondary-level teachers.

## HAS OUT-OF-FIELD TEACHING INCREASED OR DECREASED IN RECENT YEARS?

Despite all the reform efforts reviewed earlier, out-of-field teaching does not appear to be decreasing. Overall the national levels of out-of-field teaching changed little from 1987 to 2000. (see Figure 3). Indeed, at a national level the overall amount of out-of-field teaching slightly increased in several of the core academic subjects in the last half of the 1990s—from 1993-94 to 1999-2000. During this period substantial teacher quality reform was being implemented, but notably, the NCLB Act had not yet begun.

**Figure 3. Percent of Public Grade 7-12 Teachers in the Core Academic Fields without a Major or Minor in the Field, by Year.**



However, the data also show substantial differences among states during this period. Table 2 more closely examines changes in out-of-field teaching for each state from 1993-94 to the end of the decade. It presents data on the percent of 7-12<sup>th</sup> classes in the four core academic fields (math, English, science, and social studies) taught by teachers who did not have a minor or major in the field taught. This is a different measure of out-of-field teaching than that used in Table 1—which focused on teachers, instead of classes. Because most of those who teach out of their fields do so for only part of the day, the Table 2 estimates of the percentages of classes are lower than the Table 1 estimates of the percentages of teachers. The Table 2 measure is also the indicator that the NCLB Act now requires states to report for schools.

Table 2 shows that in only 11 states did the proportion of out-of-field classes change over that period by a statistically significant amount (i.e. at a 95 % level of confidence). For nine of those states, out-of-field teaching increased—Connecticut, Florida, Louisiana, Missouri, Nevada, New Mexico, New York, Texas, and West Virginia. For only two of those states did out-of-field teaching decrease—New Jersey and Wisconsin.

To be sure, there may have been improvements in states in the qualifications of teachers and teaching not captured by these data on out-of-field teaching. Moreover the data in Table 2 do not separate the four core academic fields—small sample sizes made this determination difficult to assess with confidence. No doubt, some states may have had improvements in some fields that are not captured here. But the data in Table 2 do indicate that most states during those years did not make any overall

**Table 2. Percentage of Public 7-12 Grade Classes in the Four Core Academic Fields Taught by Teachers without a Major or Minor in The Field, by Year and State**

	1993-1994	1999-2000
<b>Nation</b>	<b>21.78</b>	<b>24.21*</b>
Alabama	21.73	22.97
Alaska	30.80	29.44
Arizona	32.37	34.50
Arkansas	17.81	18.24
California	29.43	26.68
Colorado	19.11	20.05
Connecticut	13.49	27.31*
Delaware	29.01	37.45
District of Columbia	15.81	18.37
Florida	21.45	28.42*
Georgia	25.49	31.02
Hawaii	24.35	33.04
Idaho	21.82	26.22
Illinois	20.98	22.03
Indiana	17.23	12.99
Iowa	15.64	15.66
Kansas	22.12	19.51
Kentucky	29.47	31.68
Louisiana	29.63	40.15*
Maine	27.14	29.37
Maryland	20.71	22.33
Massachusetts	14.50	19.44
Michigan	19.66	20.44
Minnesota	10.01	7.28
Mississippi	26.71	30.03
Missouri	14.97	24.36*

Montana	19.96	20.47
Nebraska	15.46	15.49
Nevada	16.55	30.49*
New Hampshire	16.27	20.58
New Jersey	24.86	17.47*
New Mexico	23.15	35.17*
New York	13.12	18.11*
North Carolina	17.72	19.41
North Dakota	11.79	16.39
Ohio	25.30	30.08
Oklahoma	21.50	25.98
Oregon	28.51	26.05
Pennsylvania	20.82	22.22
Rhode Island	9.65	17.66
South Carolina	23.54	22.49
South Dakota	21.30	22.23
Tennessee	29.52	35.62
Texas	20.95	29.67*
Utah	17.16	19.37
Vermont	15.70	22.51
Virginia	26.60	28.37
Washington	26.94	26.03
West Virginia	21.54	30.38*
Wisconsin	27.14	13.68*
Wyoming	18.27	19.03

\* Percentage differences from 1993-1994 to 1999-2000 were significant at  $p < 0.05$ .

progress toward the goal of ensuring that our nation's 7-12<sup>th</sup> grade classrooms are all staffed with minimally qualified teachers, in this case defined as those staffed by teachers with at least a college minor in the subject taught. Note that this bar is lower than that sought by the NCLB. This finding raises crucial questions—why are so many teachers teaching subjects for which they have little background, why has contemporary education reform not alleviated this problem, and what are the prospects for NCLB doing so?

The next section turns to these questions. My objective is not to undertake a detailed look at why particular states fared better than others, but to examine the sources of out-of-field teaching and the limits of existing teacher policy.

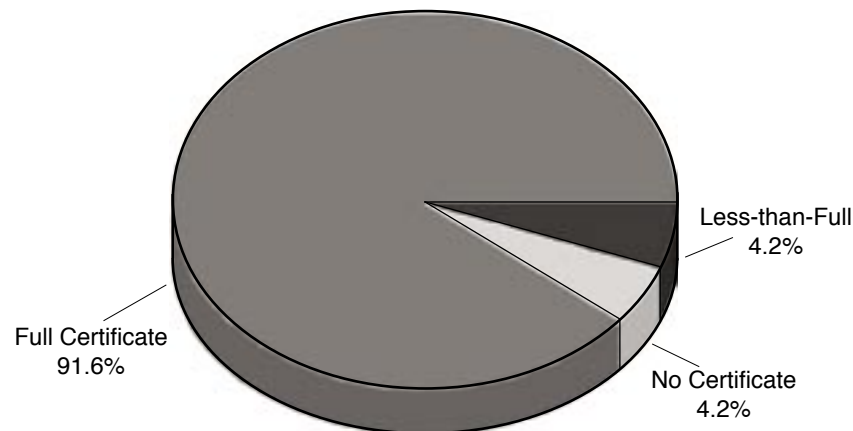
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## WHY IS OUT-OF-FIELD TEACHING SO WIDESPREAD?

Typically, policymakers, commentators, and researchers have assumed two related explanations for the continuing problem of out-of-field teaching. One involves the adequacy of qualifications and preparation of teachers; the other involves the adequacy of the quantity of teachers produced. The first holds that out-of-field teaching is a problem of poorly prepared teachers. In this view, teacher preparation in college or university training programs, and that required by state certification standards, lacks adequate rigor, breadth and depth, especially in academic and substantive coursework, resulting in high levels of out-of-field teaching. (e.g. Darling-Hammond 1999; American Council on Education 1999; Soler 1999; Toch 1996; Committee for Economic Development, 1996). Proponents of this view typically assume that the problem can be remedied by requiring prospective teachers to complete a “real” undergraduate major in an academic discipline. This explanation of out-of-field teaching is incorrect.

The SASS data indicate that most teachers, in fact, hold college degrees and teaching certificates. Almost all public elementary and secondary school teachers in the U.S. have completed a four-year college education. Ninety-nine percent of public school teachers hold at least a bachelor’s degree and almost half hold a master’s degree or higher. Moreover, as shown in Figure 4 about 92% of public school teachers hold a regular or full teaching certificate. Another 4% hold only a temporary, emergency or provisional certificate. About 4% of public school teachers hold no teaching certificate of any type.

**Figure 4. Percent of Public School Teachers, by Type of Certification, (1999-2000).** (Full includes advanced and probationary)



These latter data appear to conflict with conventional wisdom. In recent years, much attention has been focused on the plight of school districts, especially those serving low-income, urban communities, that have been forced to hire significant numbers of uncertified teachers to fill their teaching vacancies. The national data suggest, however, that the numbers of teachers without a full certificate actually represent only a small proportion of the K-12 public teaching force. In a workforce of almost three million, about 125,000 teachers have only a less-than-full certificate and another 126,000 teachers have no certificate at all.

Many of these teachers, of course, have education and not academic degrees. Critics of teacher education have long argued that subject-area education degrees, such as in math education, have tended to be overloaded with required courses in education to the neglect of coursework in the subject itself. Indeed, it is precisely

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because of such problems that many states have, over the past decade, upgraded teacher education by, among other things, requiring education majors to complete substantial coursework in an academic discipline. (National Association of State Directors of Teacher Education and Certification, 1997). There is no question that the teaching force has and can continue to benefit from higher education and training standards.

But, this view confounds and confuses different sources of the problem of underqualified teaching; it mistakes teacher preservice education with teacher inservice assignment. The data show that those teaching out of field are typically veterans with an average of 14 years of teaching experience, and about 45% of out-of-field teachers hold graduate degrees but in disciplines other than the subjects in which they have been assigned to teach. At the secondary level, these misassignments typically involve one or two classes out of a normal daily schedule of five classes. Hence, out-of-field teachers are typically experienced and qualified individuals who have been assigned to teach in fields that do not match their training or education. This is a widespread and chronic phenomenon. The data show that each year some out-of-field teaching takes place in well over half of all U.S. secondary schools, and each year over one fifth of the public 7-12<sup>th</sup> grade teaching force does some out-of-field teaching. Hence, mandating more rigorous academic requirements for prospective teachers will help little if large numbers of such teachers continue to be assigned to teach subjects other than those for which they were trained.

The key question thus becomes—why are so many teachers misassigned? In answer to this question most observers and commentators have assumed that out-of-field teaching is a result of teacher shortages—the second of the two popular explanations of the source of out-of-field teaching. This view holds that shortfalls in the number of available qualified teachers primarily due to increasing student enrollments and an aging teaching workforce have forced many school systems to resort to lowering standards to fill teaching openings, the net effect of which is high levels of out-of-field teaching. (see e.g., National Commission on Teaching and America's Future 1996, 1997). This view seems to make sense, but the data show it is only partly true.

It is true that demand for teachers has increased in recent years. Since the mid 1980s, student enrollments have increased, the majority of schools have had job openings for teachers, and the size of the teacher workforce has increased. Most important, substantial numbers of schools do, indeed, report difficulties finding qualified candidates to fill their teaching openings (for a more detailed examination of the data on the teacher shortage, see Ingersoll 2001b; 2003c). These staffing difficulties are clearly a contributing factor to out-of-field teaching.

But, there are several problems with teacher shortages as an explanation for out-of-field teaching. First, shortages cannot explain the high levels of out-of-field teaching that exist in English and social studies, fields that have long been known to have teacher surpluses. Second, even when the rates of student enrollment increases were at their peak in the mid-1990s, not all schools experienced recruitment problems, and the SASS data indicate that about half of all misassigned teachers in any given year were employed in schools that reported no difficulties whatsoever finding qualified candidates for their job openings that year. Indeed, in any given year much out-of-field teaching takes place in schools that did not even have any vacancies or openings for teachers in that year.

Some out-of-field teaching is no doubt unavoidable, but the data (see Table 1) also show that schools vary dramatically in how much out-of-field teaching they have. In a series of separate multivariate analyses designed to explore these school-to-school differences, I have found that the way schools are organized and teachers are managed

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accounts for as much of the problem of out-of-field teaching as do inadequacies in the supply of teachers. For example I have found that, after controlling for school recruitment and hiring difficulties and after controlling for school demographic characteristics, factors such as the quality of principal leadership, average class sizes, the character of the oversight of school hiring practices provided by the larger district, and the strategies schools use for teacher recruitment and hiring are all significantly related to the amount of out-of-field teaching in the school (Ingersoll 2002a, 2004).

The data tell us that decisions concerning the hiring and selection of teachers and the allocation of teachers to course and program assignments are primarily the responsibility and prerogative of principals and other building-level school administrators (Ingersoll 2003a). These administrators are charged with the often difficult task of providing an increasingly broad array of programs and courses with limited resources, limited time, a limited budget, and a limited teaching staff (Delany 1991; Ruby 1999). Some have argued that school managers have long faced a tension and gap between the expectations and demands placed on schools by state and federal governments and the time and resources provided to them (Kirst 1984).

School principals not only have the responsibility to decide who teaches which courses and programs, they also have an unusual degree of discretion in these decisions. While teachers are subject to an elaborate array of state certification requirements designed to ensure their basic preparation and competence, there has been little regulation of how teachers are employed and utilized once on the job. Teacher employment regulations are weak or rarely enforced and most states routinely allow local school administrators to bypass even the limited requirements that do exist (Education Week 2000, 2003; Robinson 1985). In this context, assigning teachers to teach out of their fields is a useful and acceptable administrative practice.

For example, rather than trying to find and hire a new science teacher to teach a newly state-mandated, but under-funded, science curriculum, a school principal may find it more convenient and cost-effective to assign a couple of English and social studies teachers to each "cover" a section or two in science. Or, if a teacher suddenly leaves in the middle of a semester, a principal may opt to hire a readily available, but not fully qualified and less expensive, substitute teacher rather than initiate a formal search for a new teacher. Similarly, when faced with the choice between hiring a fully qualified candidate for an English position and hiring a less qualified candidate who is also willing to coach a major varsity sport, a principal may find it more expedient to do the latter. When faced with a tough choice between hiring an unqualified candidate for a science teacher position or doubling the class size of one of the fully qualified science teachers in the school, a principal might opt for the former choice, resulting in a smaller class, but taught by a lesser qualified teacher. If a full-time music teacher is under contract, but student enrollment is sufficient to fill only three music classes, the principal may find it both necessary and cost effective in a given semester to assign the music teacher to teach two classes in English, in addition to the three classes in music, in order to employ the teacher for a regular full-time complement of five classes per semester. If a school has three full time social studies teachers, but needs to offer 17 social studies courses, or the equivalent of three and two-fifths full-time positions, and also has four full-time English teachers, but needs to offer only 18 English courses, or the equivalent of three and three-fifths full-time positions, one solution would be to assign one of the English teachers to teach three English courses and two social studies courses.

All of these managerial choices to mis-assign teachers may save time and money for the school, and ultimately for the taxpayer, but they are not cost free and, moreover, with the advent of the No Child Left Behind Act they have become illegal.

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## WHAT ARE THE SOLUTIONS TO THE PROBLEM OF OUT-OF-FIELD TEACHING?

Understanding the reasons behind out-of-field teaching assignments is important because of their implications for solving the problem. As reviewed earlier, most recent federal, state, and local teacher policies and initiatives have focused on two general approaches to trying to ensure that all classrooms are staffed with qualified teachers: upgrading the qualifications of teachers; and increasing the quantity of teachers. These kinds of initiatives are also emphasized in the No Child Left Behind Act. The Title II portion of the Act, for example, focuses on enhancing teacher inservice and preservice training and teacher recruitment in its list of methods approved for funding.

Underlying these kinds of methods is what might be called a teacher deficit perspective—the assumption underlying this perspective is that the primary source of underqualified teachers in schools lies in deficits in teachers themselves: their numbers, preparation, knowledge, ability, and licensing, etc. Of course, upgrading teacher recruitment, preparation, and certification practices and requirements can be useful first steps. But, the above methods do not address the ways schools themselves contribute to the problem of underqualified teachers. The data tell us that solutions to the problem of out-of-field teaching must also look to how schools are managed and how teachers are utilized *once on the job*. In short, recruiting thousands of new candidates and providing them with rigorous preservice preparation or inservice professional development will not solve the problem if large numbers of such teachers continue to be assigned to teach subjects other than those for which they were prepared. Indeed, if legislation, such as the No Child Left Behind Act, results in increased accountability for teachers without commensurate changes in schools it could lead to a classic problem: employees blamed for things over which they have no control and end up exacerbating the very teacher quality and quantity problems the legislation seeks to solve.

If assigning teachers to teach out of their fields has been a prevalent administrative practice for decades because it is more efficient and less expensive than the alternatives, then its' elimination will not be easily accomplished simply by legislative fiat. In order to meet the goal of ensuring all students are provided with qualified teachers, states will need to rethink how districts and schools go about managing their human resources.

One area that will need rethinking is how school staffing decisions are made and who makes them. The data tell us that teacher staffing decisions have traditionally followed a top-down command model: school principals make such decisions and teachers typically have little say over which courses they are assigned to teach (Ingersoll 2003a). As the earlier examples illustrate, these staffing decisions often involve difficult tradeoffs and sometimes lead to out-of-field teaching. In contrast districts and schools could implement mechanisms of school-based management and distributed leadership where such decisions are shared with those who must live with, and may be held accountable for, the consequences—the faculty. Similarly, states could provide training and assistance to district and school administrators in how to better balance tradeoffs between organizational, budgetary, *and* educational needs—the domain of instructional leadership.

Another area that will need rethinking concerns teacher employment practices. Meeting standards for qualified teachers will be more difficult in some settings than others. Rural school districts, for example, tend to have smaller secondary schools with a smaller faculty. As a result, the data suggest, teachers in these schools are more often required to be generalists, teaching a variety of subjects regardless of their background. In these kinds of settings, states might consider the use of itinerant teachers, where schools could share the use of teachers with preparation in a specialty.

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This could include the employment of retired teachers. Similarly, states could fund technology in order to provide rural and hard-to-staff schools with access to teachers with preparation in a specialty.

A third area that will need rethinking concerns the provision of administrative support for teachers. The data indicate that beginning teachers are more likely than veteran teachers to be given out-of-field assignments (Ingersoll 1999). Disproportionately burdening newcomers probably contributes to the problem of high levels of beginning teacher attrition. Moreover, the data indicate that when teachers are mis-assigned they are largely left to their own devices. Where it is difficult to entirely eliminate out-of-field teaching, districts could prohibit out-of-field assignments for new teachers, provide funding for additional course work for mis-assigned teachers, or provide funding for veteran teachers to mentor, assist or team teach with mis-assigned teachers.

## CONCLUSION

The above strategies can help states and districts ensure that all classes are staffed with qualified teachers. Ultimately however, long-term solutions to these issues will require addressing the underlying systemic roots of the problem. Problems of teacher quality and quantity—inadequate preparation, low certification standards, teacher misassignment, teacher recruitment, and retention difficulties—are not new to this occupation and to some extent can all be traced to a common root: the low stature and standing of the teaching occupation (Lortie 1975; Tyack 1974). Unlike in many European and Asian nations, in this country elementary and secondary school teaching has been largely treated as semi-skilled work since the development of public school system in the late 19<sup>th</sup> century (Etzioni 1969; Lortie 1975; Tyack 1974).

The comparison with traditional professions is stark. Few would require cardiologists to deliver babies, real estate lawyers to defend criminal cases, chemical engineers to design bridges, or sociology professors to teach English. This also applies for the high-skill blue-collar occupations: few, for example, would ask an electrician to solve a plumbing problem. The commonly held assumption is that such traditional male-dominated occupations and professions require a great deal of expertise and, hence, specialization is necessary. In short, for well-paid, well-respected professions and occupations it is rarely acceptable to lower standards as a coping mechanism.

In contrast, despite a wealth of research establishing that high quality elementary and secondary teaching is highly complex work, the teaching occupation has never been granted commensurate stature and standing. Underlying out-of-field teaching is the assumption that female-dominated, pre-collegiate school teaching requires far less skill, training, and expertise than traditional professions, and, hence, it is appropriate to use teachers like interchangeable blocks. The larger challenge is clear: upgrading the quality of teaching in the long term requires that we begin now to upgrade the quality of the teaching job and occupation.

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## ENDNOTES

- <sup>1</sup> An example of where the SASS data on out-of-field assignments run counter to information obtained by school officials has arisen in the state of Maine. My research shows that high school teachers in Maine are often assigned to teach subjects for which they do not have certification. But, out-of-field assignments are prohibited by the Maine Department of Education, researchers in that state have simply denied that a problem exists and have concluded that the SASS data “do not present a true picture of Maine’s teachers.” See Townsend et al. (1997, pp 34-35, 71). For an excellent earlier report on the rules and regulations different states have concerning out-of-field assignments, see Robinson (1985).
- <sup>2</sup> In Figure 1, regular certification refers to all those with regular, standard, full, advanced or probationary certification. It does not include temporary, alternative or provisional certificates. Probationary refers to the initial license issued after satisfying all requirements except completion of probationary period.

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