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# Researcher Meets the Policy Realm: A Personal Account

Richard Ingersoll

*University of Pennsylvania*, rmi@gse.upenn.edu

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## **Abstract**

Few educational problems have received more attention in recent times than the failure to ensure that our nation's elementary and secondary classrooms are all staffed with qualified teachers. Over the past couple of decades, dozens of studies, commissions, and national reports have bemoaned the quality of our teachers. As a result, there have been numerous policies and initiatives enacted at the federal, state, and local levels. The most significant of these efforts has been the No Child Left Behind Act (NCLB), enacted in 2002, which set an unprecedented goal to ensure that students are all taught by "highly qualified" teachers. These policies and initiatives have for the most part focused on either upgrading the education and preparation requirements for teachers, or on increasing recruitment and the incoming supply of teachers.

## **Disciplines**

Education

## **Comments**

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# Researcher Meets the Policy Realm: A Personal Account

*Richard M. Ingersoll*

Few educational problems have received more attention in recent times than the failure to ensure that our nation's elementary and secondary classrooms are all staffed with qualified teachers. Over the past couple of decades, dozens of studies, commissions, and national reports have bemoaned the quality of our teachers. As a result, there have been numerous policies and initiatives enacted at the federal, state, and local levels. The most significant of these efforts has been the No Child Left Behind Act (NCLB), enacted in 2002, which set an unprecedented goal to ensure that students are all taught by "highly qualified" teachers. These policies and initiatives have for the most part focused on either upgrading the education and preparation requirements for teachers, or on increasing recruitment and the incoming supply of teachers.<sup>1</sup>

Such concern with the quality and qualifications of teachers is neither unique nor surprising. Elementary and secondary schooling are mandatory and it is into the care 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, though staffing all of the nation's classrooms with qualified teachers is a perennially important issue in our schools, it is also among the

least understood. Like many similarly worthwhile reforms, I have come to conclude that the array of recent efforts, alone, will not solve the problem of underqualified teachers and low-quality teaching in this country, because they do not address some of the key causes.

One of the least recognized of these causes is the phenomenon known as out-of-field teaching—teachers assigned to teach subjects for which they have little preparation, education, or background. This is a crucial factor because highly qualified teachers may actually become highly unqualified if, once on the job, they are assigned to teach subjects for which they have little background or preparation. Educators, and those closely familiar with the way schools operate, have long known of the existence of out-of-field teaching. James Conant called attention to the widespread “misuse of teachers” through out-of-field assignments in his landmark 1963 study *The Education of American Teachers*.<sup>2</sup> Albert Shanker condemned out-of-field teaching as education’s ‘dirty little secret’ in a 1985 opinion piece in the *New York Times*.<sup>3</sup> But this seemingly odd and irrational practice has been largely unknown to the public and to policymakers. Until recently, almost no empirical research had been done on out-of-field teaching. Indeed, very few writings on schools have even acknowledged the existence of this practice.

One of the reasons for the lack of recognition of this problem was an absence of accurate data. This situation was remedied beginning in 1990, with the first release of the Schools and Staffing Survey (SASS), a major new survey of the nation’s elementary and secondary teachers conducted every few years by the National Center for Education Statistics (NCES), the statistical arm of the Department of Education. Working with this dataset in the early 1990s, several of us discovered that we could, for the first time, accurately calculate how much out-of-field teaching goes on in this country.

My interest in these issues originally stemmed from previous experiences as a secondary school teacher, first in western Canada and then later in New York, Pennsylvania, and finally in Delaware, near where I had grown up. The job of teaching, I found to my surprise, was very different in Canada than in the United States. One of the major differences was out-of-field teaching. In the Canadian schools in which I taught, misassignment was a frowned-upon and rare occurrence. In contrast, out-of-field teaching was neither frowned upon, nor rare, in the secondary schools, both public and private, in which I taught in the United States. Indeed, it seemed commonplace. My field of training was social studies, but hardly a semester went by in which I was not also assigned a couple of classes in other fields, such as math or special education. In my experience, being a successful teacher required knowing both the subject matter and how to get that across to the students. I found teach-

ing subjects for which I had little background very challenging. Two such experiences in particular stood out to me.

At one point in my career, I accepted a job at an expensive private boarding school in New England as a history and social studies teacher. Upon arriving at the school, I was surprised to find that my job had been changed by the headmaster; for half of my course load I was re-assigned to one-on-one teaching of remedial language skills to dyslexic students. I approached the headmaster to ask if this change might be re-considered, as I had no knowledge of, nor experience with, dyslexia and its remediation. He was unhappily surprised at my response and it became clear that misassignment was a normal and unquestioned administrative prerogative in his school. The headmaster concluded that I was not sufficiently “committed,” was not a “team player,” and demanded that I quit, or be fired. I quit and was quickly and easily replaced with a new teacher, less resistant to misassignment. Although out-of-field teaching was a normal practice at this setting, knowledge of it was carefully kept from parents and of little interest to the relevant authorities. Indeed, when I reported this incident to the regional school accreditation agency, charged with overseeing school quality standards, they responded that such “internal management” affairs were not their concern.

The second experience took place in a public high school in Delaware. In late August one year, just prior to the start of the semester, I received a memo from the principal indicating that my course assignments for the year had been changed. In place of teaching my most prized course—a senior elective in social problems—I had been assigned to teach two classes in 9th- and 10th-grade algebra. I went to the principal to ask why he had made this change and to stress that I had little background in math and could hardly recall what algebra was. His response was to wish me good luck. In the ensuing weeks, I rushed to search out the math teachers in the school, from which to beg and borrow texts, worksheets, and tests. I learned that it is not easy to teach algebraic equations to teenagers. A great deal of trial and error ensued, and the year was spent staying up late at night trying to stay one chapter ahead of my students.

My experiences left me with a number of questions: Were the schools in which I taught unusual in this regard? Or, was out-of-field teaching a common practice in other schools across the country? And, if so, why? Later, after leaving secondary teaching and completing a doctorate in sociology, I got the opportunity to investigate these questions in a large-scale research project using the Schools and Staffing Survey.

Even I was surprised by what I found—that out-of-field teaching is a widespread and chronic practice in a large number of American schools. The data

indicated, for instance, that about one-third of secondary-level math teachers have little formal preparation in math. Notably, my results were replicated by several NCES analysts.<sup>4</sup> I began publishing the results in the mid-1990s, first in two reports contracted by NCES.<sup>5</sup> Over the next decade, I published dozens of pieces on the issue of underqualified teachers, ranging from brief op-ed essays, to short summaries of the data, to lengthy scholarly articles laden with statistical analyses.<sup>6</sup>

The results also surprised others and captured widespread interest. Out-of-field teaching and the data from my research, and that of others, began to be widely reported in the media, beginning with an article in 1996 in the *Atlanta Journal Constitution*. Numerous newspaper editorials and syndicated columnists also took up the topic and put their spin on the data, representing a variety of political orientations.

Simultaneously, numerous education advocacy groups began to pick up on the problem of out-of-field teaching and featured my and others' research in reports and documents. Among the first of these was the National Commission on Teaching and America's Future (NCTAF), an organization advocating for upgrading and professionalizing teacher education and certification, led at the time by Linda Darling-Hammond. NCTAF issued two widely distributed reports—*What Matters Most* in 1996 and *Doing What Matters Most* in 1997—both of which featured the new data on out-of-field teaching.<sup>7</sup> This group's early interest and wide influence turned out to be significant for how the data were to be subsequently framed and interpreted. The Education Trust, an advocacy group focused on educational equity, was another prominent organization that featured my data early on, first in a 1996 report titled *Education Watch*, and subsequently in their ongoing newsletter, *Thinking K-16*, as well as in a number of later reports.<sup>8</sup>

Over the next few years, interest multiplied. I received many dozens of invitations to speak on my research from a wide range of groups. My data were included or featured in numerous other documents and reports by groups such as the National Governor's Association, the Gannett News Service, the National Center for Public Policy and Higher Education, and in *Education Week's* annual supplement, "Quality Counts," in 1998 and 2003.<sup>9</sup> In some cases, these groups simply used already published data, in other cases they contracted with me to do data "runs," that is, to generate specific indicators and statistics using the SASS raw data files, and in even other cases they commissioned me to write papers and reports presenting the data, which they would then publish.

As a result of all of the attention generated by the data, by the late 1990s the problem of out-of-field teaching became a concern in the realm of edu-

cation policy. Findings from my and others' research were frequently used by federal and state lawmakers. President Clinton cited my data and even used my own words in some of his speeches in 1997 promoting his various teacher training and recruitment initiatives. I found myself invited to address numerous legislative groups and forums at local, state, and federal levels, beginning with the House congressional hearings on education in 1998.<sup>10</sup> The research and data had a direct influence on NCLB, which explicitly requires secondary-level teachers to establish competency in each of the academic fields they are assigned to teach.<sup>11</sup>

At first glance, this story seems to be an example of success from the perspective of advocates of data-based decisionmaking and of greater use of "scientifically based" data and research to inform policy in education. The release of new data provided a first-time opportunity for researchers, the public, and policymakers to learn about a little-known but widespread phenomenon. And indeed, a national problem was seemingly "discovered." The data were widely disseminated and had—and still have—an influence on policy. Moreover, the data provide a rare "teaching moment." Examining the practice of out-of-field teaching opens an unusual window into the internal workings of schools. It has the potential to allow the public to glimpse how schools really utilize and manage—or mis-utilize and mismanage—their key human resource: teachers.

But, in some ways this story is not an example of success from the perspective of data-based decisionmaking and the use of data and research in education policy. Indeed, in some ways this has been an example of where having a little bit of information may prove to be worse than having no information at all. Despite a growing awareness of this problem and its importance, out-of-field teaching remains, unfortunately, widely misunderstood—and in ways that have strong implications for fixing the problem. Rather than using the data to understand the character and sources of out-of-field teaching, the data have at times been used to draw attention to other problems and have been misunderstood and misrepresented to advance normative agendas. Sometimes, such misinterpretation seemed to be a result of honest misunderstanding; other times, it appeared willful. Indeed, rather than data-based decisionmaking, at times my experience seemed to resemble James March's famous garbage can model of decisionmaking, where data, goals, interests, and actors are incoherently coupled, mixed, and matched.<sup>12</sup>

For me, this professional experience has been both personally gratifying and personally frustrating. On the one hand, it can be very gratifying and flattering to see interest taken in, and use made of, one's work and research. After all, this is not common in academia and most of the research we aca-

demics do lies unread in dusty journals. On the other hand, it can be very frustrating to see one's work and research widely misrepresented and used to promote policies and remedies that are not supported by that same research—policies and remedies that may do more harm than good. My response to this turn of events has been to spend much time over the past decade writing and speaking, trying to counter these misrepresentations and to develop, test, and disseminate an alternative interpretation of the data. This response, in turn, posed career challenges for me because applied and policy-oriented research is frowned upon in some parts of academia, especially departments in the arts and sciences. It can be difficult to publish such research in mainstream academic journals. And such research may count little toward promotion and tenure. Like other academics who undertake policy research and who engage in public debates, at times I felt I had to carry on something of a double life and hide my nonacademic research interests from my colleagues.

In this chapter I will try to tell this story. I begin by briefly summarizing what my research revealed about out-of-field teaching. Following that, I turn to the larger policy context and several influential, but incorrect, interpretations of the data that have gained widespread currency. Subsequently, I summarize my own interpretation of the data, and conclude by laying out the implications for research and for policy.

## **THE RESEARCH**

When I began analyzing the SASS data in the early 1990s, I quickly discovered that undertaking empirical assessments of the extent of underqualified and out-of-field teaching presents serious methodological problems. Research on out-of-field teaching has not occurred in a vacuum. The environment surrounding issues of teacher quality and qualifications has been highly charged and highly politicized (a subject I will turn to in more detail in the next section). 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 disagreement, often heated, concerning how many and which kinds of preparation and credentials teachers ought to have to be considered “adequately qualified.” This debate and lack of consensus over how to define a qualified teacher has serious implications for anyone attempting to do research on underqualified teachers.

Those of us who do this research have developed a couple of dozen different measures of out-of-field teaching, which vary depending upon whether the measures focus on the numbers of teachers doing it or the numbers of students exposed to it, according to which fields and subjects they examine,



according to which school grade levels are included, and, most importantly, according to how they define a qualified teacher. Because there have not been national databases available with accurate information on teachers' college course transcripts or test scores, in addition to their course assignments, those of us who do this research typically turn to whether teachers have one or more credentials, such as a college degree or teaching certificate, in the fields they teach. Each of our different measures has its own advantages and disadvantages, and whatever definition and measure one chooses will have its critics.<sup>13</sup>

Early on I decided to try to skirt the endless debate over how to best define an adequately qualified teacher by adopting a minimal definition and by focusing on the most compelling case. My primary focus became discovering how many of those teaching core academic subjects at the secondary level do not have at least a college minor in their teaching fields. Having a college minor, of course, does not guarantee quality teaching, or even a qualified teacher. I viewed a college minor in the subject as a minimal prerequisite. In short, I assumed that few parents would want or expect their teenagers to be taught, for example, 11th-grade trigonometry by a teacher who did not have a minor in math—or something related like math education or physics—no matter how bright the teacher.

From my personal perspective as a former high school teacher, and as a parent myself, I had assumed such an assumption was unexceptional and a matter of common sense. However, I quickly discovered that I was naïve. Some skeptics doubted the necessity of teacher background preparation in a subject, argued that out-of-field teaching is not really “much of a problem,” and devalued the necessity or relevance of research or policy on it. I quickly found such skeptics could be quite strident and aggressive.<sup>14</sup> Rather than debate endlessly whether the existing research does or does not support such an assumption, I found that the best response was to bring the debate down to a concrete and personal level by asking the skeptic if, other things equal, they would be comfortable if their child's science teacher did not have at least a college minor or major in one of the sciences. This may have not been a scientifically based method, but it seemed to work to quiet most such critics.

The SASS data show, indeed, that millions of teenagers were and are in this situation. As illustrated in Figure 5.1, over a third of all secondary school teachers who teach math do not have either an undergraduate or graduate major or minor in math, math education, or related disciplines like engineering or physics. About one-third of all secondary school English teachers have neither a major or minor in English or related subjects such as literature,

communications, speech, journalism, English education, or reading education. In science, just over one-quarter of all secondary school teachers do not have at least a minor in one of the sciences or in science education. Finally, about a quarter of social studies teachers are without at least a minor in any of the social sciences, in social studies education, or in history.<sup>15</sup>

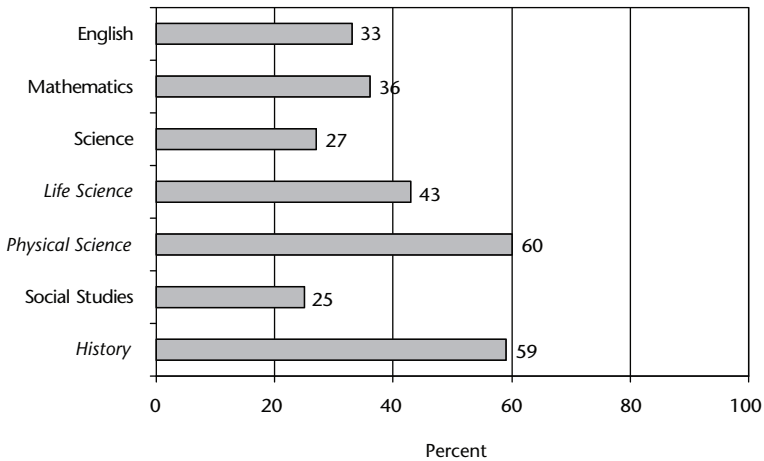
Moreover, teachers in broad multidiscipline fields, such as science and social studies, are routinely required to teach any of a wide array of disciplines within the larger field, but may be qualified to teach only some of them. For example, a teacher with a degree in biology and a teaching certificate in science may not be qualified to teach physics. So, 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, over half of those teaching physical science classes (chemistry, physics, earth or space science) are without a major or minor in any of these physical sciences. Likewise, over half of all those teaching history are without a major or minor in history itself.

Out-of-field teaching is chronic—levels have changed little from 1987 up to the present. In each of the fields of English and math and history, every year well over four million secondary-level students are taught by teachers with neither a major nor a minor in the field. However, there are striking differences in the amount of out-of-field teaching across different types of schools. In particular, teachers in high poverty schools are more likely to be out-of-field than are teachers in more affluent schools.

Of course, some of these out-of-field teachers may actually be qualified, despite not having a minor or major or a certificate in the subject. However, the starting premise in my research was that even a moderate number of teachers lacking the minimal prerequisite of a college minor signals the existence of a serious problem. To advocates of raising standards of teacher quality, whether they were teachers, policymakers, or parents of school-age children, the data raised a red flag. They also raised numerous questions.

For instance, given the ongoing national concern over the relatively low achievement test scores of U.S. students in comparison to students in numerous other nations, many viewed the data on levels of out-of-field teaching as particularly relevant. Is it any surprise, they asked, that science achievement is so low given, that even at the 12th-grade level, 41 percent of public school students in chemistry, physics, or other physical science classes in the United States are taught by someone with neither a major nor a minor in either chemistry, physics, or another physical science? In a recent cross-national study, I found nations with high-scoring students, such as Korea and Japan and Singapore, tend to have very little out-of-field teaching.<sup>16</sup>

**FIGURE 5.1** Percentage of Public Secondary School (Grades 7–12) Teachers in the Core Academic Fields Without a Major or Minor in That Field (1999–2000).



Source: Ingersoll, R. (2003) *Out-of-Field Teaching and the Limits of Teacher Policies*. Consortium for Policy Research in Education, University of Pennsylvania

Some of the most important consequences of out-of-field teaching are, however, probably those not easily quantified. The effects of being taught by a teacher without a strong background in a field may be just the kind of outcome not captured in student scores on short-answer standardized examinations. Teachers assigned to teach a subject for which they have little background are probably more likely to overly rely on textbooks (as was my own case), and the kinds of learning obtained from textbooks is probably what standardized examinations best capture. One can easily imagine the limitations imposed by a lack of subject background on a teacher's ability to teach for critical thinking and to engage the students' interest in the subject—the kinds of learning probably not well captured by standardized examinations.

Moreover, teachers who do a lot of out-of-field teaching most likely do not have the opportunity to acquire what has been called pedagogical content knowledge—knowing which approach to use with particular subjects in particular kinds of settings. Much of what constitutes effective teaching may not necessarily be generic, but may be highly nuanced, depending on the specific situation, subject matter, grade level, and type of student.

High levels of out-of-field assignments could also negatively affect the learning environment for all students in schools, not just for those students unlucky enough to be taught by out-of-field teachers. The assignment of

teachers to teach fields in which they have no background could change the allocation of their preparation time across their courses—decreasing the amount of time they spend preparing for their other courses in order to prepare for the one(s) for which they have no background.

There are, moreover, consequences for teachers to be considered. Having to cope with out-of-field assignments comes on top of an already burdensome teaching load for most public secondary teachers, who are assigned an average of 128 students and five classes per day. What is the impact on teachers' sense of efficacy of having to teach courses for which they have little formal preparation? Are out-of-field assignments associated with decreases in teachers' morale and commitment and increases in turnover? Moreover, one might also ask, does out-of-field teaching have any effect on the legitimacy and authority of teachers and, hence, classroom discipline?

### THE TEACHER QUALITY DEBATE

Research on out-of-field teaching has not occurred in a vacuum, and it is useful to discuss its context because this shaped how the data have been greeted, interpreted and used. While recently undertaking a cross-national study of teachers, I learned that the subject of teacher quality is a source of much debate and disagreement in many nations.<sup>17</sup> But, I also learned that nowhere has this debate been more pronounced and more divisive than in the United States. Indeed, parallel to the much-discussed “reading wars,” it is probably not an exaggeration to refer to analogous “teacher quality wars.” Over the past two decades, the quality of teacher education and the quality of teachers have been widely criticized in the United States, by those inside and outside the educational sector.<sup>18</sup> However, while there is widespread consensus that a problem exists, there is little consensus in regard to the sources and reasons behind the problem and, hence, the best strategies to improve things.

One of the most prominent viewpoints in this debate traces the problem of teacher quality to teacher preparation. In this view, college and university teacher education programs, and state certification standards, all too often lack adequate rigor, breadth, and depth. Accordingly, the solution, from this viewpoint, lies in making the entry and training requirements for teaching more restrictive, deeper, and more rigorous, as in the traditional higher prestige professions such as medicine, academia, and law. To this group, the surest way to upgrade the quality of teaching is to upgrade the qualifications standards required of new teachers. NCTAF has been among the prominent advocates of this view.<sup>19</sup>

An opposing viewpoint argues for deregulating entry into teaching. This viewpoint also holds that the quality of teacher education and certification is poor. But, rather than increasing requirements, this view holds that entry into the teaching occupation already is plagued by unusually restrictive and rigid bureaucratic barriers. These critics argue that there is little or no solid empirical research documenting the value of such entry requirements, and that such barriers discourage large numbers of high-quality candidates from getting into the occupation. By doing away with these regulatory impediments, this argument concludes, schools could finally recruit the kinds and numbers of candidates they deem best and this would solve the quality problems that plague teaching. The Fordham Foundation and a leading educational economist, Eric Hanushek, have been among the prominent advocates of this view.<sup>20</sup>

One of the more popular variants of this deregulation perspective favors a preparation model analogous to that utilized for entrance to post-secondary academic careers. The pre-employment preparation of professors in the United States usually includes little formal training in pedagogical and instructional methods. The assumption here appears to be that what holds in higher education also should hold in lower education, especially at the secondary level. Content or subject knowledge—knowing *what* to teach—is considered of primary importance for a qualified teacher. Formal professional training in pedagogical and methodological knowledge and skills—knowing *how* to teach—is considered less necessary, or even irrelevant.

Proponents of de-regulation have pushed a range of initiatives, most of which involve a loosening of the traditional occupational entry gates. Among the most widespread of these reforms are alternative certification programs, whereby college graduates can postpone formal education training, obtain an emergency teaching certificate, and begin teaching immediately.

It is important to note that proponents of each viewpoint—professionalization and deregulation—claim the same rationale: the enhanced recruitment of high-quality candidates into teaching. But often left unsaid are each view's differing implications for a crucial issue—costs. Professionalization and increased training would most likely necessitate increases in teacher compensation and, hence, increased labor costs. Deregulation and decreased entry requirements could lead to increases in teacher supply and, hence, decreases in teacher compensation and decreased labor costs.

Given such implications, the teacher quality debate has often been highly ideological and charged, making it difficult for neutral observers and policymakers to separate rhetoric from reality. Debate over teacher quality may be

neither unique nor surprising, but it is illuminating to place this in context. Reflecting my own bias and training, one useful context is a cross-occupational comparison. How does teaching, its entry requirements, and research on their value compare with other lines of work?

In the United States, teaching as an occupation has an oddly ironic character. Compared with other occupations and professions, teaching has relatively low pre-employment entry requirements but, nevertheless, relatively high empirical scrutiny and skepticism of these low requirements.

Compared to other occupations and, especially to the traditional professions, such as law, medicine, engineering, dentistry, and academia, teaching has a relatively low entry bar, and a relatively wide entry gate.<sup>21</sup> Placed in this context, entry to teaching is among the least restrictive and least burdensome. However, though teaching's entry training and licensing requirements are lower than those for many other lines of work in the United States, they are subject to far more skepticism and empirical evaluation than for other lines of work. For most occupations and professions there has been little, if any, empirical research done assessing the value-added of practitioners having a particular credential, license, or certification.<sup>22</sup> Nevertheless, such barriers, whether enforced by precedent or by law, are common. Indeed, it is illegal to do many lines of work, from plumbing and hairstyling to law and medicine, without a license. In short, scientific-based decisionmaking is rare in regard to occupational and professional entry requirements.

In contrast, empirical assessment of teacher's qualifications is a well-worn path. There are literally hundreds of empirical studies, going back decades, devoted to evaluating the effects of elementary and secondary teacher qualifications on teacher performance.<sup>23</sup> Typically, such studies try to assess the relation between various measures of teacher preparation and various measures of student performance. And, contrary to skeptics, a number of rigorous studies have indeed found teacher education and preparation, of one sort or another, to be significantly related to increases in student achievement.<sup>24</sup> These are telling findings given the widespread criticism from both insiders and outsiders that teacher education is of low quality in the United States.

However, accurately isolating and capturing the effects of teacher's qualifications on their students' achievement is difficult, and not surprisingly, the results of such research are, at times, mixed and contradictory. Moreover, there also are large gaps in this research.<sup>25</sup> All of which provides further fuel for the ongoing debate and further fosters interest in, and funding for, ever-more-exacting and sophisticated scientific studies in this line of research. But, placed in a cross-occupational context, the mixed and limited quality of research documenting the value of the qualifications required of elementary

and secondary teaching is not unusual; what is unusual is the existence of any such empirical research at all.

Comparing lower education with higher education is illuminating. Almost all universities and colleges in the United States require a doctorate degree for full-time professorial positions. Doctorates are a relatively high bar and require a relatively long time commitment. Some studies have put the average duration to obtain a PhD at over seven years. However, there are almost no examples of a “professor effects” literature examining the value-added of doctorate degrees and whether professors’ qualifications have any effect on outcomes such as student achievement.<sup>26</sup> Moreover, there has been little research attempting to compare the quality of teaching in lower and higher education. I have uncovered one such study; it concluded that the caliber of instruction is far higher in lower education than in higher education, but it was not a systematic or rigorous study and examined only one university.<sup>27</sup> At least for the issue of instructional quality, the widespread desire and pressure for data-based decisionmaking and for greater use of data and research to inform policy in lower education does not appear to hold in higher education. Indeed, recent attempts by the Department of Education to introduce relatively minor forms of evaluation of the quality of instruction and learning in higher education have been met with great resistance and even scorn by some higher-education leaders and some higher-education professional organizations. I find myself wondering what would be the reaction of the professoriate if the kind of high stakes, value-added teacher accountability now being proposed for teachers in lower education were to be proposed for those of us teaching at the higher-education level.

Hence, from a cross-occupational perspective, the interesting empirical question is not solely, Do teacher qualifications matter? Of equal empirical interest are additional questions: Why is this an important question? Why is there not as much concern with data-based decisionmaking in other occupations and in the traditional professions, such as law, medicine, engineering, and academia? Is elementary and secondary teaching held to a different standard in regard to empirical documentation and justification of its training and licensing requirements and, if so, why? In short, why pick on elementary and secondary teaching?

### **MISUNDERSTANDING THE PROBLEM**

Reviewing the context of this debate is useful because it has shaped how the data on out-of-field teaching have been greeted, interpreted, and used. The release of the data brought out-of-field teaching to the attention of the

public. However, it did not necessarily bring understanding of the problem. Indeed, the problem of out-of-field teaching remains, unfortunately, widely misunderstood. The major area of disagreement and misunderstanding concerns what is perhaps the most crucial question: Why are so many teachers teaching subjects for which they have little background? Correctly identifying the reasons for, and sources behind, the problem is crucial because incorrect diagnosis can result in flawed remedies.

Typically, policymakers, commentators, and researchers have offered three explanations (and sources of fault) for the high rates of out-of-field teaching: inadequate preparation or education of teachers, inflexible teacher unions, and shortages of teachers. A close examination of the data reveals that each of these views seriously misunderstands the source of the problem—with strong implications for prescription.

### **A Teacher Education Deficit**

Most observers, researchers, and policymakers have assumed that out-of-field teaching is synonymous with a deficit in teachers' education or preparation. Teachers too often lack appropriate coursework or certification, it is widely believed, resulting in the alarming statistics on out-of-field teaching. The root of this problem is assumed to largely lie with either teacher education institutions or with state certification standards. Accordingly, the remedy for out-of-field teaching is to change and upgrade the preparation requirements for prospective teachers.

Blaming out-of-field teaching on a deficit in teachers' preparation certainly seems plausible. This interpretation was adopted by Linda Darling-Hammond in two widely disseminated reports released by NCTAF,<sup>28</sup> and has come to be the conventional wisdom among a wide range of observers and groups, including politicians such as President Clinton and education professional organizations such as the National Association for State Boards of Education. This view is also embedded in NCLB.

However, parallel to the opposing positions in the teacher quality debate discussed earlier, more than one variant of this view of out-of-field teaching has appeared. One version tends to emphasize certification and tends to assume out-of-field teaching results from hiring uncertified and under-credentialed candidates. This variant assumes that the problem can be largely solved by upgrading licensing and entry standards. A second highly popular variant emphasizes subject-matter preparation, in particular, and holds that the source of the problem lies in a lack of preparation and coursework in a particular academic discipline on the part of teachers. This latter ver-



sion assumes the problem can be remedied by requiring prospective teachers to complete a “real” undergraduate or graduate major in an academic discipline or specialization. I have found this variant to be especially popular in the media and among news columnists, across a variety of political orientations, from David Broder to Maggie Gallagher to Thomas Sowell. It has also been popular among business advocacy groups, such as the Committee on Economic Development.<sup>29</sup>

Those who subscribe to one or another variant of the teacher-education-deficit view also vary widely in how sympathetically they view teachers and teacher education. Some, such as NCTAF, used the data to advocate for upgrading teacher preparation institutions; other consumers used the data to denigrate “the education establishment.” An extreme example of this latter line of thinking appeared in a late-1990s syndicated column titled “The Same Old Story” by Thomas Sowell, a senior fellow at the Hoover Institution. He traced the problem to an “education school monopoly” that purveys “gobbledygook that passes for education” and ignores the academic preparation of teachers.<sup>30</sup>

As a former teacher, I found myself personally sympathetic to the idea that teaching is complex and difficult work, and in agreement with advocates calling for professionalizing teacher preparation requirements, both subject-matter and pedagogical. However, regardless of the variant, the teacher-education-deficit view of out-of-field teaching is incorrect. My own case provides an illustration of just how misleading it is. I graduated magna cum laude from the University of California with a bachelor’s degree in sociology, and with an additional concentration in history. Several years later, I returned to academia to take part in an intensive fifth-year teacher certification program in social studies. None of this background, however, precluded me from later, as a high school teacher, being assigned to teach subjects out of my field of social studies on a regular basis.

The data show that only 1 percent of all teachers in the United States have not completed a college education, that is, do not have bachelor’s degrees; indeed, almost half of all public school teachers have graduate degrees. Moreover, over 90 percent of public school teachers and, surprisingly, well over half of private school teachers hold regular teaching certificates. In short, those teaching a subject out of field, such as math, do not lack degrees or preparation, they lack a degree in math, or in something related, such as physics, engineering, or math education.

Of course, at least since the *Nation at Risk* report in 1983,<sup>31</sup> critics of teacher education have pointed out that subject-area education degrees, such

as math education, have tended to be overloaded with required courses in pedagogy and education to the neglect of coursework in the subject itself. Indeed, it is precisely because of such problems that many states have, over the past couple of decades, upgraded teacher education by, among other things, requiring education majors to complete substantial coursework in an academic discipline.<sup>32</sup>

The teacher-education-deficit view of out-of-field teaching confounds and confuses two different sources of the problem of underqualified teaching. One source lies in the adequacy of the qualifications teachers bring to the job. A second source lies in how teachers are utilized and assigned once on the job. Out-of-field teaching is not due to a lack of education on the part of teachers, but to the lack of fit between teachers' fields of preparation and their teaching assignments. The data show that out-of-field teachers are typically experienced and qualified individuals who have been assigned to teach part of their day in fields that do not match their preparation or education. Hence, mandating more rigorous academic or certification requirements for prospective teachers may be a good thing to do, but will help little if large numbers of such teachers continue to be assigned to teach subjects other than those for which they were prepared.

This distinction between pre-service education and teacher in-service assignment may seem a simple one. But I have found it has proved to be anything but simple to communicate to others. I have puzzled over why so many observers, researchers, and policymakers have so readily assumed the former is the case, when the data so clearly point to the latter. My sense is that timing was a factor. There is no question that there are widespread problems with teacher education and teacher quality, and, as a result, both have been a major focal point of educational reform and policy for the past two decades. The data on out-of-field teaching arrived at an opportune time, with the teacher quality debate at an especially hot point. The data were new, compelling, readily available, and not already explained—in a sense, the data were up for grabs. As a result they could readily be made to fit and serve pre-existing viewpoints. Data have different uses and, in this case, the objective did not seem to be hypothesis testing, but hypothesis confirming—in the service of a cause.

### **Teacher Union Work Rules**

A second, less-widely held explanation for out-of-field teaching assumes the fault lies with teacher unions. An example of this anti-union line of thinking appeared in a late-1990s cover story in *U.S. News and World Report*, "Why

Teachers Don't Teach: How Teacher Unions are Wrecking our Schools."<sup>33</sup> The author, Thomas Toch, used data from my research to provide support for his critique of teacher unions and, in particular, their seniority rules. In his view, work rules promulgated by teacher unions are a main reason that classrooms are often staffed with out-of-field teachers. The use and abuse of such rules, according to this view, is especially prevalent in times of teacher oversupply, when school officials face the need to cut or shift staff as a result of fiscal cutbacks or declining enrollments. In such situations, "last-hired, first-fired" seniority rules require that more experienced teachers be given priority, regardless of their competence. As a result, this argument continues, veteran teachers are often given out-of-field assignments, while junior staff are transferred or laid off. Students suffer accordingly.

Nothing in my research or data has ever provided support for this explanation of out-of-field teaching. Public and private schools with unions usually have less, not more, out-of-field teaching. Moreover, teacher oversupply and layoffs are not common—only a small percentage of public school districts report that they lay off teachers because of budget limitations, declining enrollments, or elimination of courses, and these layoffs account for a very small percentage of the teaching force. Union work rules certainly have an impact on the management and administration of schools and, depending upon one's viewpoint, this impact may be positive or negative, but eliminating teacher unions will not eliminate out-of-field teaching.

As with the teacher-education-deficit explanation, I wondered about the origins of this unions-at-fault explanation of out-of-field teaching. Again, timing seemed a factor. Debate over the virtues and vices of teacher unions has been ongoing and antagonistic. My sense is that the data on out-of-field teaching provided some new compelling ammunition to advance a small part of this larger pre-existing attack on unions.

### **Teacher Shortages**

If out-of-field teaching is due to neither a lack of preparation, nor union work rules, what is its source? To outsiders, assigning teachers to teach subjects they may not know may seem like an odd, inefficient, and irrational use of an important human resource. Why are so many teachers assigned to teach subjects for which they have little background? This brings us to the most popular explanation of the problem of out-of-field teaching—teacher shortages. This conventional wisdom 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.<sup>34</sup> From this view, the solution is to recruit more quality candidates into teaching through a wide variety of initiatives.

Shortages seem to provide a sensible and plausible explanation for out-of-field teaching. But the data show this view is only partly correct. 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.<sup>35</sup> These staffing difficulties are clearly a factor that contributes 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 (see Figure 5.1). Second, not all schools experience recruitment and staffing problems, and the data indicate that about half of all misassigned teachers in any given year are employed in schools that reported no difficulties whatever 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 have any vacancies or openings for teachers in that year. In short, recruiting thousands of new qualified candidates 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.

### **AN ALTERNATIVE HYPOTHESIS**

In contrast to the above three explanations of out-of-field teaching, over the past decade I have tried to develop, test, and disseminate an alternative explanation for out-of-field teaching. This alternative view is drawn from the field of organizational theory, and from my own experiences as a high school teacher. Rather than a problem of teacher education or teacher supply, I've concluded that the data point in another direction—the occupational and organizational conditions of teaching.

Unlike traditional professions, teachers have only limited authority over key workplace decisions. Teachers, for instance, have little say over which courses they are assigned to teach. The data tell us that decisions concerning the allocation of teachers to course and program assignments are primarily made by school principals.<sup>36</sup> 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.<sup>37</sup>

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 teaching candidates 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.<sup>38</sup> In this context, assigning teachers to teach out of their fields has been a useful and acceptable managerial practice.

For example, rather than trying to find and hire a new science teacher to teach a newly state-mandated, but underfunded, science curriculum, a school principal may find it more convenient and cost-effective to assign a couple of English and social studies teachers to teach a class or two in science. 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. 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.

All of these managerial choices to misassign teachers may save time and money for the school, and ultimately for the taxpayer, but they are not cost-free. Moreover, they have become illegal with the advent of NCLB and its mandate to have academic classes taught by teachers qualified in the subject.

My view is that the prevalence of these management practices can, in turn, be explained by the occupational status of teaching. Unlike many European and Asian nations, in the United States, elementary- and secondary-school teaching is deemed as relatively lower-status work, and teachers as semi-skilled workers. The comparison with traditional male-dominated higher status 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. The commonly held assumption is that such traditional professions require a great deal of skill and training, that is, expertise, and, hence, specialization is assumed necessary.<sup>39</sup> The prevalence of out-of-field teaching suggests this assumption does not hold for elementary- and secondary school teaching.

An occupational-status perspective also provides an explanation for the irony, mentioned earlier, surrounding the relatively high empirical scrutiny

of teachings' relatively low entry requirements. Why is there such ongoing interest, compared to other occupations, in challenging whether teacher qualifications matter? From my perspective, underlying the skepticism and double standard is the assumption—as yet scientifically untested—that teaching is not especially difficult work to do well and requires less ability and expertise than, for example, working with buildings (engineers), teeth (dentists), financial accounts (accountants) or doing academic research (professors). Hence, treating teachers as low-skill interchangeable employees is viewed as a matter of efficiency.

### IMPLICATIONS FOR RESEARCH AND POLICY

Understanding or misunderstanding the reasons behind out-of-field teaching assignments is important because of their implications for both research and for policy. Differing interpretations of the data have differing implications. For instance, underlying the earlier teacher education and teacher shortage interpretations is the common assumption that the primary source of underqualified teachers in schools lies in deficits in teachers themselves—their numbers, preparation, knowledge, ability, and licensing, etc. The impetus is for ever-more-research on understanding, addressing, and erasing these teacher deficits. In short, the assumption is that to understand what is wrong with schools we need to understand what is wrong with the quality and quantity of teachers. Which kinds of preparation and certification are best? Does certification matter? Are those with higher test scores better teachers? How can we recruit more candidates into teaching? What are the effects on student achievement of whether teachers do or do not have particular degrees?

Accordingly, in recent years we have seen a mushrooming in the development and use of ever-more-sophisticated value-added and econometric statistical techniques using ever-more-detailed and expensive data bases to try to more accurately define, isolate, and measure teaching effectiveness. Such efforts are useful and have provided illumination, however, there are probably inherent methodological limits to this quest. Social science evaluation research is not new and has always faced steep hurdles in discerning the impact of human-based interventions, programs, and “treatments.” Indeed, in my field we often cite fellow sociologist Peter Rossi’s law: “The expected value for any measured effect of a social program is zero,” when analyses fail to turn up significant effects.<sup>40</sup> When reading highly complex statistical analyses, striving to quantify the results of these essentially human interactions between teacher and student, I am reminded of Raymond Callahan’s classic,

*Education and the Cult of Efficiency*, published almost a half-century ago, that tellingly critiques the 1920s and 1930s movement to rationalize teachers' work through the use of "scientific methods" borrowed from industry.<sup>41</sup>

The application of scientifically based research to education issues is also selective. In contrast to the abovementioned mushrooming lines of inquiry, there is very little research on many of the kinds of questions raised by the data on out-of-field teaching. There are very few studies looking at the effects of in-field or out-of-field teachers on other outcomes such as student engagement, critical thinking, teachers' expertise, over-reliance, rote textbook teaching, the classroom environment, student discipline, or teacher turnover.

Moreover, there has been little cross-occupational comparative research and little effort to contextualize teacher research itself. How do teaching's entry requirements and routes compare to those of other occupations? How does the complexity and character of the work itself compare to that in other occupations? What are the differences in teaching quality at lower and higher education levels?

In addition, the ongoing emphasis (and blame) placed on teacher education and teacher supply diverts attention from other sources of the out-of-field teaching problem—especially the way schools and teachers are managed and mismanaged—and other kinds of research questions. The data tell us there are large cross-school differences in out-of-field teaching, but we know little of why this is so. In a series of exploratory multivariate analyses, 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 districts and schools use for teacher recruitment and hiring are all significantly related to the amount of out-of-field teaching in schools.<sup>42</sup> Such findings are suggestive of lines of further inquiry. What are the processes behind school staffing and teacher assignment? What are the decisionmaking processes surrounding the hiring, assignment, and utilization of teachers in particular kinds of schools? What are the hidden incentive systems within which administrators make staffing decisions? How do particular teachers come to be teaching particular classes? What are the reasons behind the misassignment of teachers? In short, there is almost no research on the role of schools, and their management, in the problem of underqualified teachers. In my view, this is unfortunate. Rather than confirm old lines of argument, the new data on out-of-field teaching provide a "teaching moment"—an opportunity to broaden our understanding of how schools work and don't work.

Answering these questions and deepening our understanding of the reasons behind out-of-field teaching assignments is not only useful from a scientific perspective, but is also important because of the implications for policy. Parallel to the research realm, most recent federal, state, and local teacher policies and initiatives, including those in NCLB, have also focused on the same 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. And, again, underlying these kinds of methods is a teacher deficit perspective—the source of the problem lies in deficits in the numbers, preparation, knowledge, ability, and licensing of teachers. Hence, the assumption is that the way to fix schools is to fix these deficits in teachers.

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.<sup>43</sup>

Our analyses of the most recent SASS data provide an independent assessment of how things have progressed in terms of the highly qualified teacher requirements of NCLB. The data indicate that out-of-field teaching declined very little between the 1999–2000 school year (two years before NCLB) and 2003–04 (two years into NCLB). This is a discouraging finding, but perhaps also to be expected. If assigning teachers to teach out of their fields has been a prevalent school 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. 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—a tall order. There is a clear role here for scientific data and research, but this is a cautionary tale and one that is also not yet finished.



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8 Story Street, 1<sup>st</sup> Floor, Cambridge, MA 02138 USA\  
hepg@harvard.edu | www.harvardeducationpress.org

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