

might merely exemplify the poor decision-making that creates the need for licensing in the first place. However, this is not credible, given the large number of districts, ranging from affluent suburbs to poor inner cities, that have sought alternate route teachers. The New Jersey case is especially revealing. The percentage of districts with high socioeconomic rankings that hire alternate route teachers has regularly exceeded the percentage among low-ranking districts.³⁰ The former serve communities where parents are well-educated and closely monitor school performance. Such systems also have their pick of applicants who have obtained licenses by the traditional route. It is not likely that so many would mistakenly prefer alternate route teachers.

This argument applies still more forcefully to private schools, which operate in a competitive marketplace with a clear incentive to hire the best teachers available. As shown in Table 3, private schools employ many unlicensed instructors. Although most Catholic school teachers are certified, barely half of the teachers in other private schools are. The proportion of unlicensed teachers is particularly high among secular schools, which cannot rely on a clientele attracted by religious instruction but must compete primarily on the basis of educational quality. By hiring unlicensed teachers, these schools have increased the proportion of faculty who graduated from selective colleges and universities, as shown in Table 4.

It may be wondered whether private schools hire so many unlicensed teachers because their salaries (about 60 percent of those in the public sector) are too low to attract enough licensed applicants. This is not the case. In fact, the highest share of unlicensed faculty is found in the secular schools, which generally pay more than private schools with a religious affiliation.

All this might show only that unlicensed and alternate route teachers do well in schools serving an affluent clientele. Whether an untrained teacher should be put in

Table 3. Teachers Certified in Primary Teaching Field as a Percent of All Teachers^a

	Public School Teachers	Private School Teachers		
		Catholic	Other Religious	Non-Religious
All Teachers	95.9	73.6	50.2	55.9
Elementary	96.7	77.1	51.9	49.2
Secondary	94.8	67.7	46.4	35.1
Combined	96.0	72.2	49.6	62.8

^a **Source:** Ballou and Podgursky, 1997. Catholic school teachers who have never been married are excluded from these calculations, in order to avoid counting members of religious orders.

Table 4. Percent of Teachers Who Graduated from Selective Colleges and Universities^a

College Selectivity:	Public	Private Religious		Private Non-Religious		
	All	Certifd.	Not Certifd.	All	Certifd.	Not Certifd.
Most Competitive	1.0	.9	2.4	1.4	3.4	14.6
Other Selective	5.4	4.1	5.7	4.6	9.8	15.0
Total Selective	6.4	5.0	8.1	6.0	13.2	29.6

^a Source: Ballou and Podgursky, 1997.

a classroom where the disciplinary and pedagogical challenges are greater is another matter.³¹ However, many of the staunchest supporters of alternative certification are found in urban school systems. Administrators and educators familiar with the needs of these students are adamant in insisting that the great majority of the graduates of teacher education programs are ill-prepared to work in these systems and that alternate routes are a vital source of supply.³²

Teach for America is an alternate route program that places liberal arts graduates without education course work in public school systems facing a shortage of conventionally prepared applicants. Each year 450-500 Teach for America corps members enter public school classrooms, most in poor rural communities or inner cities. The response of administrators in these schools has been extremely positive. Three-quarters of the principals responding to a 1997 survey rated TFA instructors superior to other beginning teachers.³³ Almost two-thirds rated them above average in comparison to all faculty, including veteran teachers. Almost nine out of ten indicated they would hire a TFA instructor again. Responses on parent and student surveys were also very positive.

Several other studies have compared alternate route instructors to conventionally licensed teachers on the basis of assessments by supervisors or classroom observers. None of these studies is definitive: some do not carefully control for other factors that could influence ratings, and sample sizes are often small. The preponderance of the evidence shows, however, that supervisors and other observers judge alternate route teachers to be at least as effective as conventionally trained instructors.³⁴ Other investigators have compared scores on teacher examinations. Most studies show no difference between alternate route and conventionally trained instructors; where there is a difference, it tends to favor teachers who entered through the alternative programs.

Texas is another state that has made extensive use of alternative certification. In 1996-97, 14 percent of the newly certified teachers in the state came through alter-

nate routes. Average scores on the state's licensing examination were higher among the alternate route candidates, and a greater percentage passed on the first try. Alternate certification was a particularly important source of minority teachers. Thirteen percent of the alternate route teachers were black and 28 percent Hispanic. (The corresponding figures for traditionally trained teachers were 6 and 21 percent, respectively.)³⁵

Opponents have disparaged the professionalism of teachers who enter by alternate routes. Again, however, the data fail to support these claims. Attrition among alternate route teachers has generally been no greater than among other new teachers in the same systems.³⁶ Attitudes toward teaching expressed by alternate route teachers compare favorably with those held by conventionally trained instructors. In a 1992 survey of persons who had inquired at the U.S. Department of Education (and selected other sites) about alternative certification, nearly seven out of ten indicated that value or significance of education to society was one of the three main reasons they wanted to teach. By contrast, only 32 percent of public school teachers who participated in a comparable 1990 survey cited this as a reason for entering teaching, and only 38 percent indicated it was an important factor in their decision to remain a teacher. Conventionally prepared teachers were substantially more likely to respond that job security and long summer vacations had influenced their choice of career.³⁷

To summarize, the evidence on alternative certification and employment practices in the private sector fails to support the notion that preservice professional education is an indispensable prerequisite for successful teaching. It may help; indeed, nearly half the respondents to the aforementioned survey indicated that education courses were fairly useful in training people how to teach or instruct students. Another 18 percent found them very useful. However, nearly three-quarters believed that the ability to teach had more to do with natural talent than with college training. The percentage was higher still among those who were actually teaching (80 percent).

Costs of Regulation

As the foregoing discussion shows, reforming teacher education in line with the recommendations of the Holmes Group and the NCTAF is unlikely to improve teacher preparation significantly. Still, as there is some evidence that teachers find education courses useful, why not proceed with reform in the hope that something good will come of it? What harm can it do to try?

The answer is twofold. First, licensing and accreditation erect barriers to entry that discourage talented individuals from becoming teachers. These barriers deter teachers now, under the current licensing regime. The deterrent will be greater still if it becomes more costly and time-consuming to acquire a license. Second, reforms that empower organizations of professional educators to determine accreditation and licensing standards can stifle innovation and increase the likelihood—already great—that teacher education will be shaped by ideology rather than solid research.

NCATE presently denies accreditation to 18 percent of programs on a first application. Although many of these programs are later approved on appeal or a subsequent review, it is reasonable to suppose that if graduation from an accredited program is made a condition of licensure, some of these programs will be forced to close. Students who would have enrolled in these institutions will have to go elsewhere if they wish to teach. Some no doubt will. But the capacity of other programs to absorb them may be constrained, particularly if accredited programs are expected to meet other expensive standards established by NCATE regarding the ratio of students to faculty, the presence of full-time tenured faculty engaged in research, and program autonomy (which requires hiring more administrators, staff, etc.). In addition, some of those who now study education will not seek new schools, in

The unions have a clear interest in restricting entry to the profession, creating shortages of licensed personnel that can be used to pressure states and local school boards to raise salaries.

part because their latent interest in teaching is never awakened. A teacher education program serves more functions than the delivery of training. It is a source of information for students who want to know more about teaching careers. It provides counseling and advising. Activities of education faculty and students may arouse the curiosity of other students who had not initially considered careers in teaching; a certain amount of word-of-mouth recruitment that occurs on a campus with a teacher education program will not take place if that program shuts down.

Even if the programs denied accreditation are uniformly weak, closing them can cost the profession some talented teachers. Student populations are heterogeneous: the dispersion of licensing examination scores *within* most teacher education programs in Missouri is nearly as great as the dispersion over the entire state.³⁸ In the college with the highest failure rate, the dispersion in scores actually exceeds that for the state as a whole. Thus, even in this program an appreciable number of students did well on the exam. There are capable prospective teachers in the poorest programs.

Obviously, the harm is greater when good programs are forced to close. The principal culprit here is cost. Complaints about the cost of preparing documentation for NCATE are common.³⁹ However, it is

probably the expense of modifying or restructuring a program to make it acceptable to NCATE that is more threatening to small liberal arts colleges. In such institutions, education methods courses are often taught by adjunct faculty with no responsibilities for research. There may be no department of education, only a non-degree program staffed by faculty from other departments (e.g., psychology). Such institutions have difficulty meeting NCATE standards concerning the qualifications and responsibilities of professional education faculty and the autonomy of the program.

In the past, faced with the opposition of liberal arts colleges and other small institutions, NCATE has backed off proposals to require minimum faculty-student ratios or expenditures per student.⁴⁰ This may change if accreditation becomes mandatory,

but even if it does not, the views of organizations like the National Commission and the Holmes Group could influence NCATE's examining teams. Programs that are not prepared to spend heavily on teacher education might therefore be in jeopardy.

This is more likely given the special interest groups represented in NCATE. The two major teacher unions are particularly influential. They provide financial support and through their positions in the governance structure help to shape the council's policy.⁴¹ The unions have a clear interest in restricting entry to the profession, creating shortages of licensed personnel that can be used to pressure states and local school boards to raise salaries. Recent history shows that the unions will use their influence to reduce the number of accredited programs. In the mid-1970s, the NEA obtained more power within NCATE's governing bodies and greater representation of teachers on examining teams. The proportion of programs denied accreditation subsequently doubled, from one in ten before 1973 to one in five throughout the rest of the decade.⁴²

NCATE revised its standards for accreditation in 1987 and again in 1995. The council has announced that still another revision is under-way ("NCATE 2000"). Under the new system, organizations representing subject disciplines will have a greater role in accreditation decisions. These organizations include the National Council of Teachers of English (NCTE), a constituent member of NCATE that has been a vigorous proponent of child-centered instruction, including whole language instruction for reading in the primary grades. The NCTE's recommendations for language instruction represent the virtual antithesis of current efforts to set clear, attainable standards for student achievement and to hold students and their teachers accountable for meeting these goals. For example, at its 1993 annual meeting, the NCTE approved a resolution calling on English teachers to refrain from grading student writing. The rationale offered by one of the sponsors shows both the influence of the child-centered philosophy and the categorical thinking of the true believer.⁴³

Grading serves no educational purpose. Students have to learn to take responsibility for deciding what they want to do with their own writing, and the whole relationship is undermined if in the end you say, 'B.'

As part of the Goals 2000 education initiative, the federal government solicited national standards for English-language arts curricula from the NCTE and the International Reading Association (another NCATE member organization). Public reaction to the resulting guidelines, issued in 1996, was one of dismay mixed with scorn. As a *New York Times* editorial put it:

Given their professional credentials, these two groups could have produced a clear, candid case for greater competence in standard English, with its ample vocabulary and its simple yet supple grammar. Instead, the guideline writers

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quickly vanished into a fog of euphemism and evasion. Nowhere in their list of 12 basic rules will you find the prescriptive verbs "should" or "ought." Simple declarative sentences are equally hard to find. The rules ooze with pedagogical molasses, as in No. 5: "Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes." What, pray tell, are "writing process elements"?⁴⁴

Another NCATE constituent organization is the National Council for Teachers of Mathematics, which, as we have seen, has issued controversial standards for the teaching of mathematics. California, which adopted a curriculum based on the NCTM standards in the 1980s, subsequently replaced it with a more traditional program. The state's action was due in large part to the dismal performance of students on the state's mathematics assessment. Requiring that teacher preparation programs be accredited by NCATE could put organizations like the NCTE and the NCTM in a position to insist that English and mathematics teachers be trained in methods of dubious educational value. The result may be to stifle innovation by denying educators the opportunity to try alternative ideas. Instead, the prevailing orthodoxy within organizations like the NCTE and the NCTM would acquire the force of law, reducing the pressure on these bodies to support their prescriptions with solid research.

The reforms advocated by the Holmes Group and the NCTAF raise entry barriers to the profession by making it more time-consuming and expensive to acquire a license. It has been estimated that even a modest increase in preservice training—requiring a fifth year of study— would double the cost of becoming a teacher.⁴⁵ These reforms will deter many individuals from pursuing teaching careers.

Consider first the impact on alternative certification programs. There is no question that prolonged preservice training would deter many if not most of the individuals who now enter through alternate routes. In the aforementioned survey on alternative certification, prospective teachers working outside education cited traditional licensing requirements more often than any other reason for not seeking a teaching position. When asked why they had not applied to a traditional teacher education program, time and expense were the most common answers.⁴⁶

Career-changers are not the only prospective teachers who will be affected. Prolonging teacher education will deter undergraduates who are wavering between teaching and other options, since any increase in the requirements for a teaching license leaves less time for courses that will be helpful if they end up pursuing other careers. This reform will therefore tend to screen out (by their own choice) prospective teachers with the interest and ability to enter other professions. The effect is precisely the opposite of other reforms intended to improve teacher recruitment, notably increases in teachers' salaries. It is the purpose of a pay increase to induce capable persons wavering between two careers to choose teaching. By contrast,

raising licensing requirements has the perverse effect of discouraging individuals with attractive alternatives to teaching.

Teach for America shows that many young people are drawn by the prospect of teaching without first spending a year or two taking professional education courses. Only 22 percent of the corps members who arrived for summer training in 1997 indicated that they would have pursued a teaching career through the traditional route, had they not joined Teach for America.⁴⁷ Moreover, many Teach for America corps members remain in teaching after their two-year enlistment period ends. Of the 784 former corps members who responded to a 1998 alumni survey, 53 percent were employed in education, the great majority as classroom teachers.⁴⁸ This shows the importance of giving talented persons an opportunity to find out whether teaching is the right career for them without putting high barriers to entry in their way. Prolonged preservice training discourages individuals who want to try teaching before making a lifelong commitment to it, even though high rates of attrition from the profession make this an eminently rational strategy.

Finally, there are some individuals who, intending from the first to teach only for a few years, are clearly discouraged by the requirement that they earn a credential that has no value outside the teaching profession. Yet writing off their contribution because they will not spend their entire careers as teachers would be a mistake, as researchers at the Harvard Graduate School of Education have noted.⁴⁹

In a society with abundant opportunities for talented college graduates and a tradition of labor market mobility, it will never be possible to persuade two million of them to teach their whole lives. Public rhetoric that implies personal failure when a teacher leaves the classroom after successfully teaching for a number of years may deter many of them from ever setting foot in a classroom.

According to a consortium of teacher educators from sixteen of the most prestigious colleges and universities in the northeast, terminating undergraduate programs in education and replacing them with post-baccalaureate programs would significantly reduce the number of students entering teaching from selective liberal arts colleges. The consortium therefore opposed the recommendations of the Holmes Group, supporting instead certification options for students desiring to teach directly upon graduation.⁵⁰

Implications for Policy

The preservice training required of teachers represents a barrier to entry that deters many from pursuing a career in education. This is true under the current system; the problem will certainly grow worse if regulatory reform raises the bar. Thus,

Organizations that would play a leading role in accreditation have endorsed educational methods of dubious value.

any improvement among teachers who complete the new requirements must be weighed against the lost talents of those who would have become teachers under the current system but are deterred from pursuing teaching careers when additional hurdles are put in their way. Too much is unknown about the impact of reform to quantify these things with precision. But the evidence strongly suggests that the costs may be substantial compared to the benefits.

First, there is little indication that the reforms under consideration would significantly improve teacher training. Graduates of NCATE-accredited programs appear to be no better than teachers who have graduated from other programs. There are doubts about students' capacity to benefit from longer preservice programs, given the importance of learning on the job. Organizations that would play a leading role in accreditation have endorsed educational methods of dubious value, raising further questions about the benefits of reform. In addition, teaching ability appears to be much more a function of innate talents than the quality of education courses. Teachers themselves tell us that this is so. We come to similar conclusions when we examine the determinants of scores on teacher-licensing examinations. Finally, teachers who enter through alternative certification programs seem to be at least as effective as those who completed traditional training, suggesting that training does not contribute very much to teaching performance, at least by comparison with other factors.

In these circumstances, the primary focus of policy should be the recruitment of capable persons into teaching. It is more important how teachers are *selected* than how they are trained. Schools of education have not demonstrated that they are able to turn mediocre students into effective teachers. If they could, our conclusion might be different. As matters are, efforts to improve teacher training should not interfere with the more critical task of raising the quality of the pool of prospective teachers.

This is precisely where the reforms under consideration fail. They offer little protection to the public from incompetent or corrupt local school administration. For example, even if it were true that programs accredited by NCATE were superior to non-accredited programs, many graduates of the former have weak preparation in their subjects and receive low (albeit passing) scores on licensing tests. Requiring NCATE accreditation would do nothing to prevent an undiscerning school district from hiring the weakest graduates of the weakest programs that meet NCATE's undemanding standards.

On the other hand, districts that seek out better teachers will find the pool of promising applicants reduced, not merely in size but in quality, as new barriers to professional entry discourage persons of above-average ability from pursuing careers in education. As a result, the limited benefits realized by these reforms come at too great a price. Public schools are deprived of the chance to hire capable individuals who are deterred by the high costs of obtaining a license, solely to ensure that the teachers they do hire have completed an "improved" program of professional education of comparatively modest value. This is not an appealing trade-off, particularly if

there exist other policies that can achieve reformers' legitimate goals at lower cost.

Testing Teachers

Organizations that advocate the reform of teacher education, such as the National Commission on Teaching and America's Future, also endorse the use of examinations and other assessments to determine when teachers are ready to enter the classroom. Their support for a hybrid system should not obscure the fact that the two approaches to licensure are conceptually and practically distinct. Licensing on the basis of test results represents an important alternative to transcript-based licensing. In a test-based system, course work would become subsidiary to the examinations. Smarter students and born teachers could get through faster. By eliminating superfluous requirements—if in fact that also happens—licensing based on demonstrated competence could significantly lower the entry barriers that deter capable persons from becoming teachers.

Testing provides a flexible, relatively inexpensive way for teachers to demonstrate knowledge of subjects in which they do not hold a college major or minor.

Testing teachers' knowledge of their subjects is not a new idea: twenty-two states already assess subject knowledge, mostly through standardized, multiple-choice tests. Some of these tests are not rigorous and the scores required to pass are low. However, these are not objections to testing per se. With decades of experience developing similar tests for student achievement, test-makers have acquired the expertise to construct examinations that provide an accurate, comprehensive appraisal of teachers' subject knowledge. Sophisticated methods are available to screen items for cultural bias. Compared to the alternative—counting course credits—standardized tests afford a much more uniform, consistent basis for determining whether prospective teachers know their subjects.

In addition, testing provides a flexible, relatively inexpensive way for teachers to demonstrate knowledge of subjects in which they do not hold a college major or minor. As a result of the proliferation of interdisciplinary studies and the overlap between traditional fields, many college students receive substantial training in subjects in which they neither major nor minor. Area studies and foreign language majors study a great deal of history. Economics majors learn a lot of applied mathematics. Students of international relations receive a background in history, geography, and comparative political systems. Communications studies majors, depending on their area of concentration, may have learned a great deal about journalism, psychology, sociology, and current events. This blurring of boundaries between traditional fields poses considerable practical problems for transcript-based licensing. By contrast, the maker of a subject examination can be indifferent to what graduates have studied, focusing instead on what they are expected to teach. Although the tests in use have not reached this level of specificity, in principle there could be a test for each school subject. Thus, a teacher who sought to teach beginning algebra could demonstrate

the required competency in the subject by passing a suitably designed algebra test. An English teacher with a knowledge of history (whether or not there is anything identifiable as a history course on her transcript) could qualify for a license by passing the history exam.

Given the modest correlation between test scores and teaching performance, it is inevitable that there will be individuals with mediocre test scores who would nonetheless be effective in the classroom.

Teachers' interests change and develop over the course of their careers. A licensing system should be flexible enough to recognize new areas of expertise. In 1986, the Carnegie Forum on Education and the Economy articulated a vision of a profession marked by deep intellectual curiosity and ambition.⁵¹

Teachers should have a good grasp of the ways in which all kinds of physical and social systems work; a feeling for what data are and the uses to which they can be put, an ability to help students see patterns of meaning where others see only confusion.... They must be able to learn all the time, as the knowledge required to do their work twists and turns with new challenges and the progress of science and technology.... We are describing people of substantial intellectual accomplishment.

When public schools succeed in recruiting teachers of this caliber, the licensing system should not erect obstacles that prevent them from teaching subjects in which they have developed knowledge and expertise, solely because they have not earned the right college credits.

The more difficult issue in subject matter testing is where to draw the cutoff score. Everyone agrees that teachers must know something about the subjects they teach: the hard question is, how much? Research shows that there is a positive correlation between teachers' knowledge of their subjects and the achievement of their students, but the correlation is not very high.⁵² Many things affect teaching performance besides how well the teacher understands the subject. Given the modest correlation between test scores and teaching performance, it is inevitable that there will be individuals with mediocre test scores who would nonetheless be effective in the classroom. (And, conversely, some who pass the exam should not teach.) The problem with an examination-based licensing system is that it does not permit school systems to consider all of the relevant information when filling vacancies. If a prospective teacher falls even one point short of a cutoff score on an examination, districts are not allowed to consider any other factors to determine whether this individual might be an effective teacher.

Proponents of subject matter testing often argue that the purpose of the test is only to screen out teachers whose knowledge of the subject falls below the minimum level necessary to teach effectively. They acknowledge that there is more to teaching than subject matter knowledge, but they maintain that below some minimum knowledge of the subject a teacher cannot be effective, no matter what his or her other

qualities. They are right, of course. Someone who knows nothing at all about a subject cannot teach it. But this does not answer the question: what is the *minimum* necessary for effective teaching? In fact, no one knows. This is not surprising. It is exceedingly difficult to specify this cutoff, for in drawing such a line, we are saying that no one who scores below it can be an effective teacher, that there is no possibility of compensating with resourcefulness, charisma, energy, humor, or any of the other personal traits that can contribute to good teaching. The difficulty of establishing such a cutoff has led many educators to argue that licensing decisions should not rest on the results of any one assessment, but that subject matter tests must be weighed with other factors in deciding whom to license. Whether this is a better policy depends, however, on the quality of the other information available to the licensing authority.

Assessments of Teaching Performance

Until recently, knowledge of how to teach has been assessed in the same way as knowledge of what to teach: through standardized written examinations. Such tests of pedagogical knowledge have come in for a great deal of well-deserved criticism. Because so many teaching decisions are highly context-specific, test items regularly fail to assess examinees' knowledge in a meaningful way. Either the situation is so simplified that context is relatively unimportant—but then the answer is obvious—or important contextual facts are omitted and the correct answer is unclear.

In response, the Educational Testing Service, which produces the National Teacher Examination and the Praxis series, has begun development of more open-ended, constructed response questions on teaching knowledge.⁵³ As envisioned, these questions will pose a richly described problem situation to which test takers will respond by writing a short essay. Trained readers will then grade these essays. Still, many questions remain about the consistency of graders' scores and the relationship between test results and eventual teaching performance. Even at best, examinations of this type provide only a partial measure of teaching ability. They assess professional knowledge. They do not measure affective traits. Thus, when such examinations are used for licensing teachers, they exhibit the same drawbacks as subject matter tests. Because they measure only some of the attributes of a good teacher, licenses may be denied teachers who have other, compensating attributes and abilities.

Proponents of licensing reform, concerned about the triviality and irrelevance of written examinations, have argued the need for authentic assessments based on performance under classroom conditions. With this goal in mind, one of the leading organizations in the reform movement, the National Board for Professional Teaching Standards (NBPTS), has issued standards for what effective teachers should know and be able to do. Among these standards are the following representative examples:⁵⁴

***Authentic
assessment is
time-consuming
and expensive.
There are
doubts about
the objectivity
of evaluators
and the reliability
of their ratings.***

- Teachers use a variety of methods and materials to promote individual development, meaningful learning, and social cooperation.
- Teachers use their knowledge of child development and their relationships with children and families to understand children as individuals and to plan in response to their unique needs and potentials.
- Accomplished teachers create a caring, inclusive and challenging environment in which students actively learn.

As the examples show, the language of the board's standards is very general. The lack of specificity is, to some extent, a reflection of the very problem that makers of standardized tests confront: teaching decisions are highly context-specific. Were the standards of the National Board more precise, they would run the risk of being overly prescriptive. The difficult task of translating these vague guidelines into performance-based assessments for new teachers has been taken up by another organization, the Interstate New Teacher Assessment and Support Consortium (INTASC). Examples of these assessments are portfolios, laboratory exercises and simulations, and classroom observations.

Performance-based assessments have become extremely popular in education circles. NCATE has announced its intention to use performance-based assessment to judge the quality of a program's graduates in the next revision of its accreditation standards. It is naive, however, to suppose that these instruments are popular solely because they correct defects in traditional standardized tests. Assessment instruments like portfolios answer a host of other fashionable concerns, such as the desire for examinees to become active discoverers and producers of their own knowledge (an echo of the constructivist paradigm).⁵⁵ Such assessments are also significantly less threatening to examinees. Standards are fuzzy; there is the comforting thought that no one right answer exists; allowances are made for different cultural perspectives. Teachers are likely to be given the opportunity to portray themselves in the best possible light by choosing the materials for their portfolios or the lessons they will be observed teaching.

In addition, authentic assessment is time-consuming and expensive. There are doubts about the objectivity of evaluators and the reliability of their ratings. When assessments are conducted in the field, it is difficult to control for a variety of factors that affect performance. Yet the high cost of conducting laboratory trials means that subjects are typically evaluated on a relatively small number of tasks, also compromising reliability. In addition, little is known about the predictive validity of these types of assessments and whether they are superior in this regard to more traditional ways of testing teachers.⁵⁶

Because the results of performance assessments are confidential and the methods used by the National Board are proprietary information, it is difficult to learn much about the details of performance-based assessment. Fortunately, there are a few

exceptions. One is a pilot project undertaken in Maine to explore the feasibility of replacing transcript-based licensing with a competency assessment. Following the lead of the National Board and INTASC, participating teacher educators established standards for what a beginning K-12 teacher should know and be able to do. Supervisors of student teachers were then asked to write up classroom observations, indicating whether these standards had been met. Several of these assessments were included in a report on the pilot program to the State Board of Education.

As the following excerpts show, supervisors found it difficult to fit their observations into the framework of the standards. Often the connection between the standard and the teacher's actions was unclear. Fairly trivial actions were accepted as evidence that the standard was met. Supervisors tended to write about things they liked even if the behavior was unrelated to the standard in question. In some cases they grasped for something that seemed to apply, however tangentially.

For example, the following report was submitted to show that a student teacher had met Standard VIII: *Understands and uses a variety of formal and informal assessment strategies to evaluate and support the development of the learner.* (All excerpts are from State of Maine Advisory Committee on Results-based Initial Certification of Teachers, *Final Report to the State Board of Education and the Commissioner of Education*, 1997.)

The setting for this description is an art classroom in an urban high school in southern Maine. At the beginning of class, Janice, an Art Education intern... hands out a media literacy pop quiz consisting of a magazine advertisement and a blank sheet of paper to pairs of students as they settle in at their tables. She directs their attention to questions written on the board: Before you get started on your masks, work with your partner to answer these questions. They relate to the lesson on advertising. Put the finished papers here on my desk. This quiz is a test of knowledge gained in a previous media literacy lesson.

This teacher has merely administered a pop quiz on material covered earlier. There is only one assessment strategy in evidence here, not a variety, and nothing to indicate that the quiz was particularly well-constructed or contributed to student learning, as stipulated by the standard. Students were allowed to prepare answers in pairs, suggesting that this teacher was trained to use a pedagogical method currently in fashion, cooperative learning. But if the pop quiz is intended as an assessment rather than merely a learning experience, her judgment is questionable. Even staunch proponents of cooperative learning usually stress the importance of maintaining individual student accountability.

The following report was offered to show that a student teacher met Standard I: *Demonstrates a knowledge of the central concepts, tools of inquiry, and structures of the discipline(s) she or he teaches.*

Student teacher, J.N., taught science, specifically five microorganisms [sic], to a heterogeneous grade 5/6. She included in her instruction guidelines: scientific journaling (emphasis on precision, accuracy of drawing and writing), how to share materials in a manner that respects both the things themselves and the people using them, and several opportunities to work with five self-selected and interested *first grade partners* (emphasis in original). J.N. developed an equitable and innovative rubric including clear guidelines for group work, clearly defined outcomes for the two and one-half hour laboratory which used microscopes, slides, live one celled organisms, and an electron microscope that J.N. had obtained from her own home school district through a successful co-authored grant application. Using a previously developed learning style profile of the class, J.N. made sure that every student had an opportunity to succeed based on lesson objectives that she developed from a wide variety of assessed student strengths.

The writer is clearly impressed with the performance of this student teacher, and indeed, this may have been an excellent lesson. But the things that have impressed the supervisor have little to do with the standard, which concerns mastery of subject matter. Instead, the supervisor focuses on teaching methods (how clear the instructions were, how the students worked cooperatively, how all students had a chance to succeed) and the materials used in the lesson. The only part of this description that relates to the standard is the second sentence, where the supervisor remarks that students were taught the importance of keeping precise, accurate records in scientific work.

The following submission pertains to Standard II: *Demonstrates the ability to integrate other disciplines, their concepts, tools of inquiry, and structures of other disciplines with the discipline she or he teaches.*

Student teacher, G.H., taught social studies to an eighth grade class, developed in concert with his mentor teacher, a unit on immigration. G.H. asked students to design and illustrate family shields...of the countries from which the students were traveling to the U.S. Students researched their countries of origin, presented oral reports on their reasons for leaving, wove together fact and fiction into powerful stories of courage and pride in who they were. G.H. feels that eighth graders, particularly, grow from imagining themselves to be what they may not yet be in reality; for example, one day students were creating their visas. A boy barely 5'2" described himself as a 6'4" 229 lb Russian from the Ukraine. G.H. also has begun an inventory of what motivates these students and which of the multiple intelligences (proposed and described by Howard Gardner and his team) best fits their emerging intellectual and social strengths. Linked to those multiple intelligences inventories G.H. has produced a list of choice opportunities for each student to use in developing and presenting knowledge of their (sic) native culture.

In addition, immigrants/students kept a journal of the events of their journey. In the journal they answered teacher-generated questions about conditions of passage, problems and dilemmas encountered, and joys and sorrows witnessed and lived through.

Apparently the writer believes the student teacher has met Standard II because he has integrated art (designing shields) and creative writing (stories, journals) into the teaching of social studies. These may have been sound teaching devices, but their relation to the standard is not clear, as neither appears to be a concept or tool of inquiry from another discipline. For example, were any literary concepts introduced? Did the teacher even check student journals for grammar, punctuation or style? Successful integration of methods from other disciplines also requires that they not be overused. But this question slips between the cracks in this report: we cannot tell if the teacher relied too much on student-produced art and fiction at the expense of more conventional materials.

Our comments are not meant to disparage the performance of these new teachers or the conscientious efforts of supervisors to carry out the complex task they were given. Rather, this discussion is meant to bring out two things: how hard it is to make standards like those of the National Board the basis for meaningful performance assessments, and how difficult it is for outsiders reading these reports to ascertain whether teachers truly possess the desired competency. Supervisors had trouble determining the kind of teaching behavior to which each standard applied. There was no yardstick to measure whether a standard had been met. If the supervisor could identify something that seemed to fall under the right heading, that was good enough. Ultimately, supervisors used the standards as a very loose framework for describing things the student teachers did that the supervisors liked. As a result, procedures of this kind are only too likely to reproduce the flaws of the present education system. Teachers who use trendy pedagogical techniques will be applauded. Ideological biases will enter supervisors' assessments and influence licensing decisions.

There is no reason to think that this is an isolated example, somehow atypical of performance-based assessments. Standards were patterned on those of INTASC and the National Board; evaluations were carried out by experienced teachers. Given the nebulousness of the standards, much depends on how these guidelines are interpreted, the perspicacity and professional judgment brought to the supervisory task, and the ability to convey in writing a full picture of the candidate's strengths and weaknesses. Authentic assessments are apt to be perfunctory and superficial unless evaluators have both the talent and motivation to look beyond the vague standards given them and conduct a truly probing analysis of a candidate's performance.

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Implications for Policy

Performance-based teacher assessments are still in the process of development and it is premature to conclude that they cannot play a useful role in teacher licensing. Clearly, a comprehensive, dependable assessment of teaching ability could be of great value. It would create the possibility of placing teacher licensing on an entirely different basis: if competency could be assessed directly, states could (and should) dispense with all education prerequisites (save, perhaps, that teachers hold a college degree). Teaching positions would be open to those who demonstrate the ability to do the job. To the extent that education courses help prospective teachers acquire the skills and knowledge that a competent teacher should possess, schools of education would continue to attract students and play an important role in teacher preparation. But school districts would also be free to hire teachers with unconventional backgrounds: born teachers as well as individuals who learned to teach in other settings, such as private schools, the military, tutoring centers, and the human resource departments of large corporations.

At present, however, we are not in this best of worlds. The available instruments for assessing teachers' knowledge and skills are incomplete: they measure some things that contribute to effective teaching but not all of them. Subject knowledge can be measured with considerable accuracy (even if some of the tests in current use do not). Tests of professional knowledge do not possess the same validity. Other important attributes of a good teacher, including a wide range of affective characteristics, are not measured at all.

If we raise the passing score on the exam, we will get teachers who know more and more about their subjects, but there is not much reason to think they will be better in other respects.

For all their imperfections, it is better to use these tests than to allow grossly incompetent or corrupt administrators to hire anyone they like. The problem with high-stakes testing becomes apparent when we consider the districts—presumably the majority—in which conscientious administrators seek to hire the best available applicants. As noted above, there is evidence that hiring procedures are flawed and that often the best choices are not made. But this is not to say that administrators are wholly inept. They are using some of the information available to them to decide who will be an effective teacher, even if they are not using all of the information in the most efficient way. The crux of the problem is this: when teacher tests are used for licensing decisions, districts are effectively compelled to discard information about prospective teachers who scored below the cutoff. Yet districts enjoy substantial advantages over outside authorities when it comes to assessing teaching ability. Many teachers are hired in districts where they have done student teaching or served as substitutes. In such cases, principals will often have first-hand knowl-

edge of teaching performance based on classroom observation as well as feedback from other teachers, parents, and students. This puts the principal in a position to make judgments about aspects of teaching performance that licensing exams measure

poorly, if at all. To a lesser extent, the same is true when schools have candidates teach a sample lesson and put them through a rigorous set of interviews. On top of this, school officials will have knowledge of local needs and circumstances bearing on an applicant's suitability that external examiners cannot begin to match.

We have come back to a problem discussed above in connection with the reform of teacher education. Licensing restricts districts' choices. This is socially beneficial when a district would otherwise make extremely poor hiring decisions. But to achieve this goal, state licensing ties the hands of all other districts as well. The impact is most adverse where administrators have the greatest trouble recruiting in the first place. These districts, often serving poor and working class children, hire many teachers who are unable to obtain jobs in systems with higher salaries and better working conditions. Such teachers will, on average, lie closer to the cutoff on any licensing examinations that are given: they are the marginal candidates who just get by. Since the licensing test is an imperfect indicator of teaching ability, a school system that hires such teachers will find it beneficial to be allowed to consider applicants who did not pass the licensing test, who are marginal on the other side of the line. Because the district has information about teaching ability that differs from that provided by the test alone, it will correctly find some of the marginal (but failing) applicants superior to the marginal (but passing) applicants it must otherwise hire. This other information need not be perfect—indeed, districts might not be much better than the test at identifying who will teach effectively. The key point is that this information differs from that provided by the test. Teacher recruitment is impaired when administrators are compelled to ignore this information and hire teachers instead for the sole reason that their test scores are slightly higher.

Advocates of stricter testing might admit that this is correct, yet argue that it misses the point. A licensing system will inevitably screen out some candidates who would have been effective, but it is worth paying this price to ensure that all teachers meet an acceptable minimum standard of proficiency. Thus, if the standards are set high enough, we can be assured that districts will be hiring good teachers—perhaps not as good as some might have obtained if standards were relaxed, but good nonetheless.

The flaw in this argument is the assumption that policymakers can set a floor on teacher quality using the imperfect instruments available. They cannot. Licensing on the basis of a subject matter test ensures only that teachers know their subjects, not that they are able to do all the other things required of an effective teacher. If we raise the passing score on the exam, we will get teachers who know more and more about their subjects, but there is not much reason to think they will be better in other respects. Meanwhile, as the passing score rises, we eliminate from considera-

Because local administrators are in a better position to evaluate teacher candidates, the principal focus of policy should be improving their performance, not revising standards for statewide licensing.

tion a growing number of teachers who are effective by virtue of other, untested characteristics.

Policy Directions

In many respects, the conclusions of the preceding section echo those of this section. Teacher licensing is not a powerful tool for upgrading the work force: the information available to a licensing board or agency does not allow it to predict with sufficient accuracy who will be an effective teacher and who will not. Because local administrators are in a better position to evaluate teacher candidates, the principal focus of policy should be improving their performance, not revising standards for statewide licensing.

If all the groups interested in providing an alternative to traditional public education were given an opportunity to compete on equal footing with the public schools, there are many urban and suburban communities in which public schools would face a substantial competitive threat.

In some respects, this is hardly a surprising conclusion. The purpose of licensing is to protect the public from poor decisions by school administrators. Yet unlike other licensed occupations, where practitioners in the private sector sell their services to private individuals, both teachers and administrators are state employees. Thus, teacher licensing amounts to a curious situation in which the state licenses some of its employees (teachers) because it does not trust other employees (administrators) to carry out their jobs properly. One might well suspect there are better solutions to this problem.

Improving Accountability

Public school administrators must face appropriate incentives and sanctions to ensure that staffing decisions (indeed, all decisions) are made in the best interests of the public. Generally speaking, there are two ways this can be achieved. In the private sector, poor performance is disciplined by the market, as parents exercise their right to choose another school. Strengthening parental choice is one way to enhance accountability within public education. Alternatively, schools can be held accountable by setting standards for student achievement and monitoring school performance through curriculum-based examinations. Recently, there has been growing interest in a third way, in which school districts contract with vendors for the provision of educational services, an approach that combines market competition (among vendors) with accountability, represented by the contract and its possible non-renewal.⁵⁷ Charter schools also represent a hybrid of this type. They are subject to market discipline, but they are also held accountable through their charters, which may not be renewed if the

school fails to achieve its objectives.

Establishing meaningful accountability is not easy. As critics of school choice have pointed out, choice disciplines schools only to the extent that parents are willing

and able to exercise it responsibly. In addition, without a large number of options to choose from, many students will remain in poor systems where the absence of a significant competitive threat will perpetuate business as usual. Holding administrators accountable for student achievement also raises difficult practical issues. How is allowance to be made for factors over which administrators have no control? Who is accountable for the achievement of students who change schools in mid-year, a frequent occurrence in urban systems?

Real as these difficulties are, they are not insurmountable. Evidence from experiments in education reform indicates that both mechanisms can be used to enhance accountability and that schools change as a result.

Systematic study of the impact of choice on the performance of traditional public schools has only begun. However, anecdotal evidence confirms what has often been observed in other sectors of the economy: faced with competition, even rigid institutions change. An interesting demonstration of this phenomenon occurred in Albany, New York, where a philanthropist offered \$2000 toward private school tuition for any child attending the Giffen Memorial primary school, a chronically underperforming school.⁵⁸ A sixth of the school's students accepted. The Albany Board of Education, which had initially ridiculed the offer, ended up replacing Giffen's principal, hiring nine teachers, adding two assistant principals, and spending more on books, equipment, and teacher training. This example demonstrates a point that economists have long made about competition: it is not necessary that all consumers be informed decision-makers for market discipline to work. Rather, it is necessary only that a critical minimum of consumers turn to other suppliers. When this happens, firms (or, in this case, a school) will begin to take corrective action. Here the critical minimum was reached by the time one-sixth of the students had chosen other schools.

One of every ten elementary and secondary students today attends a private school. Many of these schools could accommodate more students. More schools would start up if parents received vouchers that could be used to send their children to the school of their choice, public or private. The rapid growth of private tutoring in the form of after-school programs and contracted-out instructional services (Sylvan Learning Centers, Huntington, etc.) shows that entrepreneurs are ready to respond in varied ways to parents' dissatisfaction with public schools. This entrepreneurial activity is also evident in the charter school movement. From the first school, which opened in 1992, the number of charter schools has grown to 1,100.⁵⁹ There would be still more, were it not for inadequate start-up financing, caps on the number of schools written into the enabling legislation, and impediments put in the way by hostile host districts. If all the groups interested in providing an alternative to tradi-

Holding schools accountable for student achievement strengthens the incentive for school administrators to hire wisely, putting to good use the advantage they enjoy over licensing agencies in evaluating prospective teachers.

tional public education were given an opportunity to compete on equal footing with the public schools, there are many urban and suburban communities in which public schools would face a substantial competitive threat. If market discipline fails to improve school accountability in these communities, it is not likely to be the result of an inadequate response by the providers of services or an inadequate demand for alternatives, but rather because artificial barriers are erected to protect the jobs of those who work in traditional public schools.

Educators in the public schools have long resisted efforts to hold them personally accountable and professionally responsible for student achievement. Even modest merit pay plans are resisted on grounds that too many factors beyond their control influence student achievement. Requiring educators to produce results if they want to keep their jobs would provoke far greater opposition. Nonetheless, there is evidence that high-stakes accountability works. Since 1995, Chicago has pursued an aggressive policy of holding students and schools accountable for performance on tests of basic skills. Students who fail the exams are required to attend summer classes and to repeat grades if their performance does not improve. Junior and senior high schools in which an unacceptably high percentage of students fails basic skills tests are placed on probation and threatened with reconstitution, a process in which administrators and teachers lose their automatic right to stay in the school by virtue of seniority. An outside review board decides who is to stay: the rest lose their jobs and new teams of educators replace them.⁶⁰

This approach has brought results.⁶¹ Test scores have risen for three straight years. Forty percent of Chicago elementary pupils are now at or above the national norm in mathematics, an increase of ten percentage points from 1995. Gains have been almost as great in reading. It is noteworthy that these results have been achieved even though the city's indicators for monitoring performance are the very sort that seem most unfair to educators. No allowance is made for students' incoming level of skills. City officials rejected such a policy on the grounds that schools would then be able to evade accountability. This may be correct. Yet under the current system, a teacher of low-achieving students who manages to improve their test scores (but not enough) can be penalized, while an instructor fortunate enough to have high-achieving students may teach them nothing at all without being held to account. A more balanced approach that puts some weight on students' net gains and some on their absolute level of achievement would provide a better set of incentives.⁶²

Holding schools accountable for student achievement strengthens the incentive for school administrators to hire wisely, putting to good use the advantage they enjoy over licensing agencies in evaluating prospective teachers. Such a policy correctly aligns incentives with information: administrators who are in the best position to judge should have the authority to decide who will teach in their schools, reaping rewards if the decisions are sound and suffering consequences if they are faulty.

Although the misalignment of policy is apparent in the way teachers are initially licensed, it is even more evident in policies that protect veteran teachers from dismissal, a clear instance in which the information available to a local administrator is not used. Most public school systems award tenure to teachers after a few years' continuous service. In addition, as public employees teachers are protected against arbitrary dismissal. Districts are required to show "just cause" before teachers can be fired, a stipulation that typically entitles teachers to an administrative hearing with judicial review. Most teacher contracts specify that layoffs be conducted on the basis of seniority. As a result, teachers who have completed a few years of service enjoy an extraordinary degree of job protection.

The number of public school teachers dismissed for incompetence is exceedingly small. The cost of such efforts is a major deterrent: for example, a 1993 survey by the New York State School Boards Association found that the average disciplinary proceeding against a tenured teacher or administrator cost taxpayers \$176,000.⁶³ As a result, it appears that most school districts take such steps only in extreme cases. A review of employment records for all public school teachers in Washington state between 1984 and 1987 turned up only forty-two whose contracts were officially terminated.⁶⁴ This is consistent with statistics from other states. Fewer than 6 percent of the teachers in 141 medium-sized California districts surveyed in 1982-1984 were dismissed for incompetence.⁶⁵

By contrast, administrators in the private sector have much greater authority in personnel matters. With the exception of some unionized Catholic high schools, teacher contracts are written for one year and can be renewed or not as the school chooses. There is no tenure. While nonrenewals for unsatisfactory performance are not common, they do occur.⁶⁶ Of equal importance is the way private schools handle reductions in staff. With the exception, again, of some Catholic dioceses where contracts are collectively bargained, layoffs are never based solely on seniority. For obvious reasons, private schools seek to retain their most effective teachers, whether senior or not. Over time, this can have a substantial effect on the quality of the workforce. For example, in a single year (1990), the contracts of 1.3 percent of private school teachers were not renewed because of budget limitations, declining enrollments, or elimination of courses.⁶⁷ If this year is typical, then over a decade some 10 percent of the private school workforce, many of whom have been deemed less effective than their peers, are put through a competitive screening process in which they must prove themselves to other employers or leave teaching.

Finally, union contracts in many large cities permit senior teachers to transfer into schools with vacancies whether the principal of the receiving school wants them or not. This practice is damaging for two reasons. First, it disrupts efforts to build a cohesive team of teachers at the school level, impeding efforts to hold principals accountable for student achievement in their schools. Second, because transferring teachers generally must have acceptable ratings from their current supervisor, these internal transfer systems create further disincentives for principals to document pro-

professional malfeasance. Instead, it is easier to award satisfactory ratings in the hope (or with the understanding) that an ineffective teacher will go elsewhere in the system.

Policy Recommendations

State teacher licensing is a substitute for local accountability. As local accountability improves, licensing becomes less important. Indeed, if school administrators make wise personnel decisions, licensing loses its positive function and merely constrains managerial prerogatives, preventing administrators from hiring the best teachers they might otherwise find.

Proponents of stricter licensing have suggested that it would serve other purposes.

For example, some argue that, without high standards for professional training,

If school administrators make wise personnel decisions, there is little to be said for stricter licensing standards, or indeed, for licensing at all.

prospective teachers will choose the easiest route into the profession, attending weak programs with low standards rather than a quality program.⁶⁸ But this ignores the incentives facing would-be teachers. Unlike administrators, who are acting on behalf of the public and who must be held accountable in some fashion, prospective teachers represent only themselves. If administrators seek to hire the best available teachers, good training provides its own reward by improving teachers' chances of obtaining the most attractive jobs. Regulations compelling prospective teachers to act in their own interest are unnecessary.

This does not mean that weak programs of teacher education will necessarily disappear. Many of these programs are in weak colleges serving, for the most part, weak students. But the fact that some of these students major in education is of no greater concern than the fact that others major in business administration. Public schools are not obliged to hire the former any more than businesses are compelled to put the latter in managerial positions. There is a problem

here, of course, but it is not one that teacher licensing can solve. More rigorous licensing and accreditation standards might lead some of these programs to close, but if districts hire wisely, this protection is redundant: either way, weak graduates of these programs will fail to find teaching jobs.⁶⁹

Some proponents of stricter licensing standards have also argued that more capable individuals will be attracted to a profession that is seen to have rigorous entry requirements. If regulations make it harder to become a teacher, the stature and prestige of the profession will rise, which in turn will attract more talented persons. However, those who make this claim have offered no evidence to support it, and the argument appears to be based on wishful thinking. Although teachers regularly complain about the lack of respect accorded them, their biggest concerns in this regard are relationships with students and parents and the amount of time they are required to devote to tasks they consider non-professional. We are aware of no evidence indicating that many capable persons are deterred from teaching careers

because they do *not* have to pass rigorous entry examinations or complete protracted programs of professional education.

Some light is shed on this question by a 1985 Louis Harris survey of the teaching work force, in which teachers were asked whether various reforms would help to attract good people into teaching.⁷⁰ Although this was the wrong group to ask (the question should have been put to non-teachers), nearly two-thirds replied that requiring new teachers before certification to pass rigorous examinations comparable to other licensed professionals would help a little or not at all. By contrast, nearly 80 percent said that providing compensation to beginning teachers comparable to other professions that require similar training would help a lot. Almost three-quarters were as positive about reducing the amount of time teachers spend in non-teaching duties.

In summary, if school administrators make wise personnel decisions, there is little to be said for stricter licensing standards, or indeed, for licensing at all. Because administrators have better access than licensing agencies to information about job candidates, the best policy is, first, to ensure that administrators will use this information in the public interest by holding them accountable for school performance, then to remove unnecessary encumbrances on their ability to recruit widely and hire the finest teachers they can find. Moreover, in a system that holds administrators responsible for student achievement, it would make little sense to entrust others with the task of screening teacher candidates. No one else, including a licensing agency, will have the same strong incentive to ensure that appropriate decisions are made. As we have seen, this is of particular concern when licensing relies on the results of performance-based assessments, in which the quality of information is highly dependent on the skill and motivation of third-party evaluators.

However, policy often fails to achieve the best outcomes, forcing us to consider what might be second-best. Clearly, this is the situation we face in public education today. Although there has been progress in empowering administrators and holding them accountable for student achievement, there is a long way still to go. Many institutional barriers remain. Many administrators have developed little skill in teacher selection and appraisal. In many states, new standards for student achievement are too vague or too weak to ensure meaningful accountability. Teacher unions vigorously resist policies that strengthen administrators' powers. Past efforts to enhance accountability have often been highly disruptive, putting school systems through a great deal of turmoil only to achieve, in the end, rather meager results. This has made political leaders reluctant to repeat them. The efforts of several states in the 1980s to test veteran teachers and dismiss those with low scores is a case in point. Even in Chicago, where early indications suggest that reform has had positive effects, city officials have announced that there will be no reconstitutions of schools in 1998-99.

For the present, it is wisest to rely on a mix of different policies, strengthening accountability and incentives where possible, but not omitting other measures that would also improve the quality of the work force.

A Policy Mix

For the present, then, it is wisest to rely on a mix of different policies, strengthening accountability and incentives where possible, but not omitting other measures that would also improve the quality of the work force. In this policy mix, what is the role for teacher licensing?

We begin with what licensing policy should *not* be. It should not increase the already substantial power and influence of private organizations of education practitioners. Such organizations include teacher unions as well as bodies like the National Council of Teachers of English and the National Council of Teachers of Mathematics, constituent members of NCATE. Given the clear interest of incumbent teachers in limiting teacher supply, organizations in which unions play a prominent role, such as NCATE, should not be placed in a position in which they can effectively shut down programs of teacher education. Subject specialty organizations like the NCTE and the NCTM have endorsed approaches to teaching that are controversial and of doubtful educational value. Simple prudence suggests that it is unwise to require every teacher education program in the country to meet standards set by these organizations. Instead, policy should promote a vigorous competition in ideas that compels educators to present solid research defending their views on teaching and learning.

In addition, before policymakers resort to regulations that tie the hands of school administrators, they should make full use of less restrictive measures that serve the same ends. For example, mandatory accreditation is seen as a way to compel teacher education programs to improve. Indeed, some policymakers who do not support NCATE accreditation have also proposed measures intended to force improvement. These include denying federal funds to programs when too many of their graduates fail teacher licensing exams or, in more extreme versions, shutting such programs down.

Such measures do not protect the public from poor hiring decisions by school districts. Districts are already prevented from hiring teachers who fail the licensing test. Rather, these penalties are directed at the institutions that train teachers, to goad them into raising their admissions or exit standards or improving their program content. But closing programs, for reasons we have described, reduces the supply of teachers and impairs recruitment. Before taking such drastic steps, policymakers ought simply to publicize scores on licensing examinations by institution. This would make the information available to school districts and to prospective teachers, who are likely to respond in ways that will pressure programs of teacher education to improve. To date, this kind of information has not been readily available. Indeed, states maintain administrative records from which it is possible to derive even more revealing information, such as the percentage of a program's graduates that are teaching in the state's public schools, the types of districts in which they are employed, how long they continue in teaching, and the salaries, on average, that they earn. At present the public knows none of this.

Information is concealed even from those who would appear to have a clear claim to it. In states that use licensing examinations developed by the Educational Testing Service (including the National Teachers Examination and the Praxis series), it is current policy to deny school districts access to teachers' scores. Instead, districts find out only whether an applicant passed the test (i.e., received a license). Districts may not learn the scores of those who passed for purposes of deciding whom to hire.

It is the Educational Testing Service that insists on this policy. The reason offered by the ETS is that these tests have been validated for licensing purposes only, not for such other purposes as employment. In these validation studies, panels of educators were asked what proportion of minimally qualified candidates would be able to answer a particular item correctly. Thus the tests are said to contain information only about minimal qualifications, not about qualifications of applicants above that level.

This is a specious argument. First, it has never been established that the educators asked this question are able to answer it—i.e., that they can compartmentalize professional knowledge, distinguishing the knowledge that makes a teacher minimally competent from that which contributes to performance at higher levels. Indeed, since there is no external standard, the process is entirely circular: minimal competence is whatever these experts say it is.

Second, scores on these examinations have been found to be highly correlated with scores on other tests of academic aptitude or achievement, such as college entrance examinations. Research has shown that scores on achievement and aptitude tests (particularly tests of verbal ability) are positively related to teacher effectiveness. The research has not shown that there are ceilings in this relationship—levels above which higher scores make no difference to performance. It would be surprising, then, if the NTE and the Praxis examinations did not contain information about teaching performance beyond the knowledge required to be minimally qualified.

In addition, states have set different passing scores. This puts ETS in the untenable position of claiming that, in one state, it is relevant to know whether an examinee was able to score at least 85 out of 100, but in another state (where the passing threshold is only 80), information in the 80 to 85 range is of no value to prospective employers. This is nonsense. School districts should have access to the scores of teacher applicants. If ETS is unwilling to validate its tests for this purpose, states should find test-preparers that will.⁷¹

In summary, policymakers who want to upgrade teacher education or who desire that school districts do a better job of screening job applicants have a variety of other instruments they can employ apart from licensing regulations. It is important that these tools of policy be used and that licensing be limited to the narrow function it best serves: to protect the public from the worst abuses of incompetent or corrupt administrators. With this in mind, we offer the following recommendations for licensure policy.

I. Expand alternative certification.

States that do not have alternate routes for entering teaching should establish them. Those that do should remove restrictions that limit the size and scope of these programs for reasons unrelated to teacher quality. For example, because alternative certification programs are often designed to facilitate mid-career changes, many will not accept individuals who recently graduated from college. This precludes the participation of a younger, more mobile part of the workforce. Given that age is not used to determine who may enter a traditional teacher education program, there is no reason to erect this artificial barrier to alternate route teachers.

Many other restrictions have been placed on alternate routes that prevent them from being used to their full potential. In some states, districts may hire alternatively certified teachers only after declaring that no regularly certified teacher could be found.⁷² This makes sense only if *any* regularly licensed teacher is superior to *all* teachers who enter by alternate routes. This is patently false, as shown by hiring patterns in states that do not impose such restrictions. Elsewhere, there is a major focus on recruiting minority teachers for urban schools. This is a laudable goal; however, there is no reason to limit alternate routes to this function, rather than the more general objective of recruiting better teachers for all schools. Some states cap the number of teachers who may enter by alternate routes. In other cases, program size is constrained by easily identified bottlenecks—for example, a limited number of places in a required summer workshop. These restrictions should be lifted.

II. Streamline entry into professional development schools.

The Holmes Group and the National Commission have advocated internships in professional development schools for all new teachers. Unfortunately, they would delay this clinical experience until prospective teachers had completed one or two years of education courses. We recommend that applicants instead be selected for internships on the basis of undergraduate transcripts and examination results and that they begin to work at once. Essential courses can be taken concurrently with their clinical training. This would reduce the time teachers are required to spend in preservice courses and allow them to begin immediately the kind of training that they are likely to find most interesting and useful. States will be even more successful in attracting able teachers if trainees receive a stipend for the work they perform in the professional development school.

Teacher training that is structured in this manner will be similar to a model of on-the-job training that has been successfully used in more than one hundred independent private schools.⁷³ These schools hire new college graduates with no prior training in education to serve in internships at half-pay. Interns work for one year under the supervision and with the assistance of an experienced teacher. At the end of that year, they may be offered a regular position in the same school, should there be a vacancy, although the more usual outcome is for the intern to move on to another

school on the strength of recommendations from the first. The internship model gives private schools an opportunity to hire bright new graduates who are eager for a real teaching opportunity (as we know from the response to Teach for America) while at the same time making sure they are not sent unaided into the classroom. Although compensation is very modest (50 percent of a starting salary that is already low by public school standards), it is clearly superior to the prospect of taking out student loans to finance two or three years in a post-baccalaureate teacher education program.

III. *Relax licensure requirements for teachers employed in charter schools.*

Teacher licensing involves a trade-off: protection from poor administrative decisions versus the good that results when competent administrators are given a freer hand. Licensing regulations should strike the right balance between these objectives. Regulations that are set correctly for the traditional public school will over-regulate a school where accountability has been enhanced by other means. This is clearly the case in charter schools. These schools must satisfy their customers and the authorities that review their charters. Both are mechanisms for accountability lacking in the traditional public school. Because they check abuses of administrators' prerogatives, charter schools should be granted greater freedom to employ teachers who seem right for the school, even if those instructors have not met all the standards required by the licensing agency.

Some states have pursued just this kind of policy by permitting charter schools to hire unlicensed teachers. In other states, a predetermined percentage of charter school teachers may be unlicensed.⁷⁴ Both policies are consistent with this principle. However, in some states the permitted share of unlicensed teachers is small (e.g., 20 percent). Should it become apparent that many schools reach this ceiling, these states should raise the limit.

IV. *Give schools meeting standards for student achievement the freedom to hire unlicensed instructors if they desire.*

Many states are now in the process of establishing standards for student achievement. Political and practical obstacles remain before these efforts result in a clear set of guidelines for public schools. However, when (and if) this process is complete, schools will know what is expected of them and the public will have ways of monitoring whether those goals have been achieved. When this occurs, schools that are achieving the goals set for them should have freedom to hire faculty as they see fit. There is no justification for constraining the decisions of administrators who are performing to the public's expectations. Rather, the record of superintendents and principals in such schools entitles them to the presumption that decisions to employ unlicensed teachers are made for good reasons.

This proposal will encounter opposition, not least from education schools eager to preserve their role in teacher training. If it should prove politically impossible to enact this reform, there would still be considerable benefit if schools meeting performance standards could employ teachers who are unlicensed when first hired, allowing them to earn their licenses over time, as many parochial schools do now. This policy would give schools access to applicants who want to try teaching before committing the time and money required to earn a license, while at the same time preserving the role of schools of education in the preparation of teachers.

V. Complement subject-matter tests with policies to enhance local accountability and expand the applicant pool.

For capable persons, testing raises fewer barriers to entry than does the requirement that all teachers complete lengthy programs of preservice training. It is also a more flexible and accurate way of assessing subject knowledge than requiring a specified

number of course credits. For these reasons, we recommend that states move away from transcript-based licensing toward a testing-based system.

Tests currently available are not comprehensive measures of teaching effectiveness. As a result, no matter where the passing score is set, errors will occur. Some who pass will not be effective teachers; some who might have taught well will fail. As the cutoff score is raised, the probability of the second kind of error increases. As the cutoff score is lowered, the probability of the first type of error increases. Choice of the cutoff must therefore take into account the frequency and seriousness of errors of both types.

However, the two errors are not symmetric, a fact with important policy implications. Ineffective teachers who pass the test will receive licenses, but this does not imply that any of them will ever teach. The mistake made by the licensing agency may be caught at a subsequent stage as these individuals seek jobs. The better local school administrators are at screening job applicants, the more likely this is, and the less harm is done by the initial error. On the other hand, if the licensing agency rejects someone who would have made an effective teacher, there is no later opportunity to correct this mistake (if schools must hire licensed teachers). Because of this asymmetry, we recommend

that licensing agencies err in the direction of leniency, particularly as policies are put in place to enhance local accountability.

Improving hiring practices at the district level cushions the system against the consequences of setting the licensing standard too low. How can we protect against the possibility that the cutoff score will be set too high? The answer in this case is to expand the teacher applicant pool (a good idea in its own right, provided it is done

Higher salaries are more likely to produce an improvement in teacher quality if complementary reforms of the type under discussion—flexible licensing policies and enhanced accountability—are adopted as well.

cost-effectively). High cutoff scores are a problem for districts that must hire marginal applicants—teachers who scored just well enough to pass but are not very good in other respects. These districts would benefit from the chance to hire a candidate who scored a few points lower on the test but is stronger in other ways. The advantage of expanding the applicant pool is that fewer districts are put in a position where they must hire marginal candidates at all. When there are more applicants who are strong in all regards, licensing can serve its central function without substantial unwanted side effects. It protects the public from administrators who would make very poor hiring decisions without unduly constraining decisions in the remaining schools.

It may seem obvious that the way to expand the applicant pool is to raise teachers' salaries. However, raising pay alone is not likely to produce significant improvements in teacher quality.⁷⁵

Capable college graduates with attractive options outside teaching need to be able to enter teaching without first completing a long preservice training program. The latter requirement poses a barrier to entry that works at cross-purposes to higher salaries. In addition, new incentives are needed to induce school districts to focus on recruiting teachers with strong academic backgrounds. Higher salaries are therefore more likely to produce an improvement in teacher quality if complementary reforms of the type under discussion—flexible licensing policies and enhanced accountability—are adopted as well.

It should be the object of policy to increase the accountability of local administrators for student achievement, thereby enhancing incentives to make personnel decisions—indeed, all decisions—in the public interest.

Conclusion

Recommendations that public school teachers meet stricter licensing standards are an understandable reaction to low levels of achievement in American public schools. However, policymaking in this area must be tempered by the recognition that the state has limited means to compel improvement in teacher quality through licensure regulations. Accreditation of teacher education programs by an organization of professional educators has not improved the quality of the workforce in any way that we can detect; moreover, there is much potential for harm if the power to withhold accreditation is used to promote untested and ill-conceived educational ideas. Licensing on the basis of teacher tests serves some useful purposes, but the assessment instruments available to date offer only an imperfect and incomplete measure of teaching performance.

We are persuaded that real progress will be made only if local school administrators—not licensing agencies or accrediting bodies—are made the focus of policy. The reasons can be summed up in two words: information and incentives. No one in public education is in a better position to decide which teacher is right for which school than local administrators. Principals and superintendents have access to better

information about teacher candidates and school needs than distant licensing agencies. If they do not use this information as well as they might, the solution is not to hem them in by turning control over key aspects of teacher recruitment to external accrediting, licensing, or assessment agencies. Rather, it should be the object of policy to increase the accountability of local administrators for student achievement, thereby enhancing incentives to make personnel decisions—indeed, all decisions—in the public interest.

- ¹ While some states nominally require private school teacher to hold licenses, our own analysis of Department of Education data on private schools suggest that such requirements are not vigorously enforced. See Dale Ballou and Michael Podgursky, "Teacher Recruitment and Retention in Public and Private Schools," *Journal of Policy Analysis and Management* (Summer 1998): 393-418. As a consequence, private schools hire large numbers of unlicensed teachers. Several states allow charter schools to hire unlicensed teachers as well.
- ² Robin Henke et al., *Schools and Staffing in the United States: A Statistical Profile, 1993-94* (Washington D.C.: U.S. Department of Education), 58. The figure of 92 percent includes teachers with advanced, regular, and probationary certificates. Probationary certificates are awarded to new teachers who are in the first stage of the regular certification process. Omitted are teachers with alternative, temporary, emergency, provisional, or no certificates. Subtotals in these last categories should be regarded with caution, since many teachers appear to be confused about whether they hold one type of non-standard certificate or another. (See Dale Ballou, "Alternative Certification: A Comment," *Educational Evaluation and Policy Analysis*, forthcoming.)
- ³ Dale Ballou, "Do Public Schools Hire the Best Applicants," *Quarterly Journal of Economics*, (February 1996); Dale Ballou and Michael Podgursky, *Teacher Pay and Teacher Quality* (Kalamazoo: W.E. Upjohn Institute, 1997).
- ⁴ National Commission on Teaching and America's Future, *What Matters Most: Teaching for America's Future* (Washington, D.C.: Author, 1996), 70.
- ⁵ *Ibid*, 27.
- ⁶ Carolyn M. Evertson, Willis D. Hawley and Marilyn Zlotnik, "Making a Difference in Educational Quality Through Teacher Education," *Journal of Teacher Education* 36 (May-June 1985): 2-12.
- ⁷ Frank Murray, "Questions and Answers about TEAC," remarks before the Education Leaders Council in San Jose, California, 12 September 1998, 8.
- ⁸ Jere Brophy, "Teacher Influences on Student Achievement," *American Psychologist* 4, no. 10: 1070-1071. Citations that appeared in the original have been deleted.
- ⁹ Evertson, "Making a Difference Difference in Educational Quality Through Teacher Education," 7.
- ¹⁰ Murray, "Questions and Answers about TEAC," 8-9.
- ¹¹ An extensive critique of constructivist-inspired pedagogy appears in E.D. Hirsch, Jr., *The Schools We Need and Why We Don't Have Them* (New York: Doubleday, 1996).
- ¹² The influence of ideology on pedagogy is evident in this recent defense of whole-language instruction and critique of the phonics-based alternative (Gerald Coles, "No End to the Reading Wars," *Education Week*, 2 December 1998, 38, 52):

Accompanying the call for the direct instruction of skills is a managerial, minimally democratic, predetermined, do-as-you're-told-because-it-will-be-good-for-you form of instruction.... It is a scripted pedagogy for producing compliant, conformist, competitive students and adults.... [O]ne reason political conservatives love skills-first instruction: It makes no challenges to the distribution of wealth and power, and the resources available to schools, classrooms, children, and their families. Research on skills teaching with poor children takes poverty as a "given" and seeks a minimally expensive "bootstrap" solution to a better life in a presumed meritocracy.
- ¹³ Ralph A. Raimi and Lawrence S. Braden, *State Mathematics Standards: An Appraisal of Math Standards in 46 States, the District of Columbia, and Japan*, Fordham Report, vol. 2, no. 3, March 1998, 11.
- ¹⁴ Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1983).
- ¹⁵ See Perry Klein, "Multiplying the Problems of Intelligence by Eight: A Critique of Gardner's Theory," *Canadian Journal of Education* 22, no. 4: 377-394.
- ¹⁶ *Ibid*, 387.
- ¹⁷ National Council for Accreditation of Teacher Education, *Standards Procedures & Policies for the Accreditation of Professional Education Units* (Washington D.C.: Author, 1997).
- ¹⁸ *Ibid*, 23.
- ¹⁹ We eliminated a small number of records with out-of-state institutions or for which the institution code was missing. When a test-taker repeated the same test more than once, only the first test score is used in the analysis. The classification of institutions was based on a May, 1997, list of accredited programs obtained from NCATE.
- ²⁰ *Ibid*, 15.
- ²¹ *Ibid*.

²² Ibid, 17.

²³ Data consisted of outcomes on the state's licensing test (1 if pass, 0 if fail) and scores on a set of examinations given to all students entering teacher education. The relationship estimated was a simple linear probability model for the sample of Missouri teachers on which we had complete data:

$$\text{PASS} = a + b \text{PRETEST} + c X + d \text{NCATE} + e$$

where PASS is the dummy variable indicating the outcome of the licensing test, PRETEST is a vector of examination scores required of all entrants into teacher training programs, X is a set of demographic controls (age, race, sex), and NCATE is a dummy variable taking the value one if the student was trained in an NCATE-accredited program. If NCATE is associated with higher value-added we would expect $d > 0$.

The estimates of this model are available from the authors. The individual and composite test scores for entering candidates were strong predictors of performance on the licensing exam. After controlling for these pre-test scores, however, we found an insignificant, negative coefficient on NCATE. Thus, we found no evidence that the value-added in NCATE-accredited programs is higher than in non-accredited institutions.

²⁴ Because NCATE accreditation procedures changed in 1987, the sample was restricted to individuals who graduated in 1990 or later and who began teaching no earlier than 1992.

²⁵ Years of teaching undergraduates have convinced us that most students complete calculus without understanding the fundamental concepts of limit, continuity, and differentiability. This is not very surprising. It is harder to understand these ideas than to memorize the rules, which is how most students get through the course. Thus, the NCTM's guidelines require mathematics teachers in grades 5 through 8 to understand concepts that most people who have taken calculus do not understand.

²⁶ In Kentucky, more than 40 percent of college mathematics majors were unable to pass the state's licensing examination in mathematics. Twenty percent of majors taking examinations in chemistry and biology failed (*Lexington Herald Leader*, 1 April 1998). In New Jersey, teachers entering by the state's alternate certification route have outscored traditionally certified teachers on the National Teacher Examination, even though fewer of them have majored in the subjects they teach. See Vicky S. Dill, *Alternative Teacher Certification*, in John P. Sikula, ed., *Handbook of Research on Teacher Education* (New York: Macmillan, 1996), 951. Teachers of mathematics who have majored in the subject often do not know how to explain algorithms used to solve problems and are unable to reason through problems. Their approach to mathematics is to memorize rules (G. Williamson McDiarmid and Suzanne M. Wilson, "An Exploration of the Subject Matter Knowledge of Alternate Route Teachers: Can We Assume They Know Their Subject?" *Journal of Teacher Education* 42, no. 2 (1991): 93-103).

²⁷ Lynn Olsen, "Group Says Reforms May Dissuade Some From Career in Teaching", *Education Week*, 18 March 1985. The views in question were expressed by faculty from teacher education programs in a consortium of sixteen of the nation's leading liberal arts colleges.

²⁸ Michael D. Andrews and Richard L. Schwab, "Has Reform in Teacher Education Influenced Teacher Performance? An Outcome Assessment of Graduates of an Eleven-University Consortium," *Action in Teacher Education* 14, no. 7 (1995): 43-54. The study included no controls for institutional characteristics (apart from program length) or for characteristics of teachers or the schools in which they were employed.

²⁹ Studies of student performance in Texas that controlled for student demographic characteristics and socioeconomic status found that students of alternate route teachers did as well or better than those of traditionally licensed teachers. See Stephen D. Goebel, Karl Romacher, and Kathryn S. Sanchez, *An Evaluation of HISD's Alternative Certification Program of the Academic Year: 1988-1989* (Houston: Houston Independent School District Department of Research and Evaluation, no date), ERIC Document No. 322103. In a study of mathematics achievement in North Carolina, students of licensed teachers outperformed students of unlicensed teachers (Parmalee P. Hawk, Charles R. Cable, and Melvin Swanson, "Certification: Does It Matter?" *Journal of Teacher Education* 36 [May-June 1985]: 13-15). But the number of teachers in the study was extremely small (18) and there were no controls for teachers' math knowledge (licensed teachers had more).

³⁰ New Jersey State Department of Education, *The New Jersey Provisional Teacher Program: A Sixth Year Report* (Trenton: Author, 1991), and unpublished statistical reports from the state DOE covering 1985-1996.

³¹ The notion that education classes prepare teachers for such students is hard to take seriously, given the results of a 1997 survey of education school faculty. See "Public Agenda Foundation," *Different Drummers* (New York: Author, 1997). Education school professors attached much less importance to issues of classroom management like the maintenance of discipline than did practicing classroom teachers, and were far less likely to believe it was the role of the school to teach values that contribute to an orderly classroom environment.

³² Martin Haberman, "Preparing Teachers for the Real World of Urban Schools," *Educational Forum* 58 (Winter 1994): 162-168. The point is not that urban schools face a shortage of conventionally trained applicants (though this is sometimes true). Rather, those they hire are simply not effective.

³³ Kane, Parsons and Associates, *A Survey of Principals, Parents, and Students in School Districts with Teach for America Corps Members* (New York: Author, 1997).

³⁴ Dill, 1996, is an exhaustive survey of this literature.

³⁵ C. Emily Feistritz and David T. Chester, *Alternative Teacher Certification: A State-by-State Analysis 1998-99* (Washington, D.C.: National Center for Education Information, 1998).

³⁶ Gerald J. Adams and Micah Dial, "Teacher Survival: A Cox Regression Model," *Education and Urban Society* 26, no. 1 (1993): 90-99; Dill, 1996, 950-954.

³⁷ C. Emily Feistritz, *Who Wants To Teach?* (Washington D.C.: National Center for Education Information, 1992).

- ³⁸ The statewide standard deviation on the elementary school certification test was 63.1. Of the nineteen programs that produced at least 100 test-takers during the sample period, fourteen showed standard deviations of 50 or more. In three programs the dispersion exceeded that for the state as a whole.
- ³⁹ Alan R. Tom, "External Influences on Teacher Education Programs: National Accreditation and State Certification," in Ken Zeichner, Susan Melnick, and Mary Louise Gomez, eds., *Currents of Reform in Preservice Teacher Education* (New York: Teachers College Press, 1996). Our own conversations with the deans of education schools confirm that the amount of paperwork required by NCATE is sufficiently burdensome to dissuade some schools from seeking accreditation.
- ⁴⁰ Ibid, 17-18.
- ⁴¹ Ballou and Podgursky, "Reforming Teacher Training and Recruitment: A Critical Appraisal of the Recommendations of the National Commission on Teaching and America's Future," *Government Union Review* 17, no. 4 (1997). Besides the unions, the other dominant organization in NCATE's governance structure is the American Association of Colleges of Teacher Education, which represents approximately 700 of the 1300 institutions that train teachers. These colleges might also have an interest in seeing programs closed in rival institutions.
- ⁴² Tom, 14.
- ⁴³ *Teacher Magazine*, January 1994.
- ⁴⁴ Editorial, "How Not to Write English," *New York Times*, 14 March 1996.
- ⁴⁵ Everton, Hawley, and Zlotnik, 7.
- ⁴⁶ Feistritzer, 1992. Specifically, 34 percent gave as their reason that they did not want to go back to college to take requisite courses to meet requirements for teaching credentials. To this should be added the 27 percent who said they could not find/get into an alternative teacher certification program. Since survey participants could give more than one answer, the total must be reduced by the percentage of overlapping responses (not reported). Licensing requirements were probably also responsible for deterring some of the additional 12 percent who said that it was too much trouble to find out what was required to become a teacher, as well as the 15 percent who cited too much red tape, though these responses may also show that initial interest was not very strong.
- ⁴⁷ Personal communication from Rebecca Berreras of Teach for America, 28 January 1998. The small size of Teach for America has led some to wonder whether it holds any lessons for public education. However, the program has been kept small as a matter of policy. Between 1990 and 1997, five times as many persons applied to Teach for America as were accepted for training and placed in schools. In addition, because the program provides teachers for school districts that have trouble attracting applicants, there are almost certainly many other liberal arts graduates with an interest in teaching who have not applied to Teach for America because they are reluctant to take jobs in poverty-stricken rural and urban systems.
- ⁴⁸ These data should not be taken to imply that half of all Teach for America volunteers make their careers as teachers. There is almost certainly some sampling bias in these responses: alumni who have remained active in education are probably more likely to respond to mail from Teach for America than those who have lost interest in teaching and gone on to other careers. Nonetheless, it is clearly a mistake to assume that volunteers' involvement in teaching is invariably of short duration.
- ⁴⁹ Richard Murnane et al., *Who Will Teach? Policies that Matter* (Cambridge: Harvard University Press, 1991).
- ⁵⁰ Olson, 1987.
- ⁵¹ Carnegie Forum for Education and the Economy, *A Nation Prepared: Teachers for the 21st Century* (New York: Carnegie Corporation, 1986), 25.
- ⁵² Walter Haney, George Madaus and Amelia Kreitzer, "Charms Talismanic: Testing Teachers for the Improvement of American Education" *Review of Research in Education* 14 (1987): 217.
- ⁵³ Educational Testing Service, *The Praxis Series* (Princeton N.J.: Author, 1995).
- ⁵⁴ National Board for Professional Teaching Standards, *National Board Certification Portfolio Sampler, 1996-1997* (U.S.A.: Author), unpaginated.
- ⁵⁵ James Barton and Angelo Collins, "Portfolios in Teacher Education," *Journal of Teacher Education* 44 (May-June 1993): 201.
- ⁵⁶ The National Board for Professional Teaching Standards, which has promulgated standards for the purpose of conducting performance-based assessments, has undertaken no studies of predictive validity.
- ⁵⁷ See Paul Hill, "Contracting in Public Education," in Ravitch and Viteritti, eds., *New Schools for a New Century* (New Haven: Yale University Press, 1997).
- ⁵⁸ *New York Times*, 19 September 1997, A19.
- ⁵⁹ RPP International and the University of Minnesota, *A Study of Charter Schools* (Washington D.C.: U.S. Department of Education, Office of Educational Research and Improvement, 1997); Center for Education Reform, *Charter School Highlights and Statistics*, (www.edreform.com/pubs/chglance.htm, 1998).
- ⁶⁰ Teachers who are dismissed have a year to find employment elsewhere in the system. If they fail to do so (and no school is obliged to take them), they are terminated outright. *Chicago Tribune*, 15 May 1998, 15.
- ⁶¹ *Chicago Sun-Times*, Tuesday, 19 May 1998.
- ⁶² Tennessee has demonstrated the feasibility of an approach that uses gains in student test scores to identify high-performing teachers. William L. Sanders and Sandra P. Horn, "The Tennessee Value-Added Assessment System (TVAAS): Mixed-Model Methodology in Educational Assessment," *Journal of Personnel Evaluation in Education* 8 (1994): 299-311.
- ⁶³ *New York Times*, 24 September 1995.

- ⁶⁴ Neil Theobald, "An Examination of the Influence of Personal, Professional, and School District Characteristics on Public School Teacher Retention," *Economics of Education Review* 9, no. 3 (1987).
- ⁶⁵ Edwin M. Bridges, *The Incompetent Teacher: The Challenge and the Response* (Philadelphia: Falmer Press, 1992).
- ⁶⁶ Virtually all of the school heads we interviewed for our book, *Teacher Pay and Teacher Quality*, indicated that they had dismissed an ineffective teacher on at least one occasion.
- ⁶⁷ Susan P. Choy et al., *Schools and Staffing in the United States: A Statistical Profile, 1987-88* (Washington D. C.: U.S. Department of Education, National Center for Education Statistics, 1992), 133.
- ⁶⁸ See, for example, Arthur E. Wise, "Choosing Between Professionalism and Amateurism," *Educational Forum* 58 (Winter 1994): 140.
- ⁶⁹ If teacher salaries are so low that districts have no choice but to hire graduates of inferior programs, then the market will not produce the kind of teachers districts desire, but rather the kind they can afford. This is clearly a problem, but just as clearly, licensing is not the solution. Rather, teacher pay should be raised. To adopt stricter licensing standards at a time when salaries are too low to induce enough capable people to teach would only make matters worse.
- ⁷⁰ Louis Harris and Associates, Inc., *The Metropolitan Life Survey of the American Teacher, 1985* (New York: Metropolitan Life Insurance Company, 1985).
- ⁷¹ The ETS has refused to take steps that would provide more solid evidence of validity, for example, correlating teachers' scores with achievement test scores of their students. According to one ETS official whom we questioned on this point, the opposition of teacher unions was a prominent reason for this decision.
- ⁷² Feistritzer, 1997.
- ⁷³ National Association of Independent Schools, *1997-1998 Intern and Teaching Fellow Programs in Independent Schools*, 1998.
- ⁷⁴ In Missouri up to 20 percent of a charter school's faculty may be hired without licenses. North Carolina allows 25 percent of elementary and 50 percent of secondary teachers to be unlicensed (Center for Education Reform, 1998).
- ⁷⁵ A full discussion appears in Ballou and Podgursky, 1997.

Teacher Licensing and Student Achievement

Dan D. Goldhaber and Dominic J. Brewer

States use licensing to ensure that only qualified teachers can be hired, but loopholes often allow teachers to enter the classroom via alternate routes. Comparing the performance of students whose teachers hold standard certificates with students whose teachers have non-standard credentials is one way to gauge the efficacy of licensing. Using data from the National Educational Longitudinal Study of 1988, this study finds that students whose teachers possess a B.A. or M.A. in math outperform other students in math. Students whose teachers have any kind of certification (standard, emergency, alternative, etc.) outperform students whose teachers have no certification or are certified in a different subject. The authors also report that math and science students whose teachers have emergency credentials do no worse than those whose teachers hold standard teaching credentials.

Introduction

How can we ensure that the nation's classrooms are staffed by high quality, well-trained, teachers? Answering this question is central to improving educational outcomes, particularly given the large numbers of new teachers that will be needed over the next decade due to increases in enrollment and unprecedented teacher retirements.¹ According to the National Commission for Teaching and America's Future, "More new teachers will be hired in the next decade than in any previous decade in our history."² These demographics provide policymakers with the opportunity to greatly influence the complexion of the nation's teaching workforce for a generation.

An elaborate system of training and licensure is geared toward the preparation of those entering teaching.³ However, this system has developed piecemeal over many years, and most teachers completing a state-approved program in a school of education receive a license to teach. Although efforts to develop professional certification have made some headway (e.g., through the National Board for Professional Teaching Standards), the basic state licensure system remains in place. But what is

the guarantee that the requirements for entering teaching are linked to student performance?

Surprisingly, very little research evidence exists on the effectiveness of the teacher licensure system, in terms of how well teachers subsequently teach and what works to promote positive student outcomes. Much of the educational establishment takes for granted that licensure is an important and effective screening system to create high quality teachers. For example, the recent National Commission on Teaching and America's Future (NCTAF) report, *What Matters Most*, offers a general indictment of the teaching profession. It claims that many newly hired teachers are unqualified for the job. The Commission's main concern is with teachers who have temporary, provisional, emergency licenses, or no license at all—presupposing, of course, that conventional licensure represents something we should care about.⁴

There is remarkably little rigorous research on several critical issues:

Do teachers with regular licenses perform better than those with a probationary or emergency license?

Are some components of teacher licensure more effective than others?

What effect does licensure have on the quality of individuals entering teaching?

In this paper we focus on the first two of these questions.⁵ We empirically test how students of teachers with regular certification perform relative to teachers who have probationary certification, emergency certification, private school certification, or no certification in subject, holding constant students' background and school characteristics. We also determine whether specific state-by-state differences in teacher licensure requirements systematically affect student achievement. We begin by reviewing previous work in this area.

Do teachers with regular licenses perform better than those with a probationary or emergency license?

Background and Policy Significance

The development of the modern public school system has been accompanied by the establishment of a relatively uniform path by which teachers obtain the credentials necessary to teach in the system. In the nineteenth century, teacher education shifted from "normal" schools (which often served as a substitute for high schools for those who wished to go into teaching) and less formal apprenticeship programs to college and university baccalaureate degree programs that had to meet a series of state standards for accreditation. More recently (since about 1970), there has been a shift away from undergraduate training toward post-baccalaureate programs (a professional, education specialist, master's, or doctorate degree).⁶ Today, prospective teachers must clear a series of hurdles to obtain and maintain a teaching certificate. However, licensing in the United States is a state responsibility; thus, there is consid-

Even when states do require exams, these tests often do not represent a significant hurdle to becoming a teacher.

erable variation in the hurdles associated with state licensure and certification policies.

Several high profile commission reports, such as the Holmes Group (*Tomorrow's Teachers*) and the Carnegie Forum on Education and the Economy Task Force on Teaching as a Profession (*A Nation Prepared: Teachers for the 21st Century*), have discussed ways of upgrading U.S. teachers.⁷ Most prominent among them is the 1996 NCTAF report, *What Matters Most: Teaching for America's Future*. It emphasizes the importance of teacher knowledge of both content and pedagogy and, in particular, stresses that all teachers should graduate from an accredited school of education.⁸ Despite these reports, it is not entirely clear how much is really known about the components of an effective

licensure program. In fact, a review of the research literature on this issue, by Lilly, concluded that there was little reliable evidence on the impact of this system.⁹

The means by which states influence the quality of teachers is complex, given that there are several mechanisms through which policies may affect the number and type of people who end up teaching in a state's classrooms. Some states require prospective teachers to pass standardized tests or have a minimum grade point average prior to entering a teacher-training program. As of 1997, twenty-seven states and the District of Columbia had set minimum scores that prospective teachers had to achieve on Praxis I, the initial screening test sometimes required for application to a school of education. (This is a general test of ability used to assess an individual's aptitude for teaching.)

States may also impose standards for the accreditation of colleges of education. These standards can have an impact on the type and rigor of courses offered. Most states require prospective teachers to take general course work in English, humanities, social sciences, and mathematics. But states vary as to whether they require teachers to have specific courses dealing with pedagogy or subject matter. For instance, the number of required units in pedagogy varies from 6 semester units in Texas to 36 in some states.¹⁰ Some states require a major in education, while others prohibit an education degree from fulfilling the requirements for an initial teaching license.¹¹

States also vary in terms of whether they require graduates of education programs to pass tests of basic skills, basic knowledge, content knowledge, or pedagogy.¹² However, even when states do require exams, these tests often do not represent a significant hurdle to becoming a teacher. For instance, an examination of passing rates in Pennsylvania on the (previously used) National Teacher Exam, showed that more than 90 percent of candidates passed on the first try. Further, it was possible to miss half of the questions and still receive a license.¹³ A more rigorous test recently administered to prospective teachers in Massachusetts showed that many could not meet this standard. Roughly half of those who were tested failed.¹⁴

Not all teachers obtain standard certification. Some obtain “emergency” licenses that permit teaching without having obtained the standard training and are used by districts to fill urgent or short-term vacancies. Increasingly, states have also developed various “alternative” certification routes, the best-known of which is Teach for America. In just six years, from 1986 to 1992, the number of states allowing alternative certification jumped from eighteen to forty.¹⁵ These alternative routes vary widely, but in general they allow individuals who wish to teach, such as former Peace Corps volunteers, liberal arts college graduates, and military retirees, to begin in the classroom without having first completed a formal teacher education program.¹⁶ This move has been controversial with some in the education establishment; the main concern seems to be that individuals entering through this route are of poorer quality and lack the training necessary to teach competently.¹⁷

Others believe that alternative routes attract “large numbers of highly qualified, talented and enthusiastic individuals” into teaching.¹⁸

One argument for increasing the number of paths by which people can enter teaching is that there are shortages of teachers in mathematics and science. Shen finds that those with alternative certification are more likely than other teachers to hold bachelor’s degrees in mathematics and science. Thus, these alternative routes do seem to be supplying individuals who can meet this need. The few studies of alternative certification find that students of alternate route teachers do at least as well as pupils of traditionally licensed teachers.¹⁹ However, there is little rigorous evidence on the relative effectiveness of teachers with alternative certification versus standard certification.

In fact, claims of the value of conventional teacher licensure are difficult to square with anecdotal evidence from teachers and others.²⁰ And, despite hundreds of studies by economists, sociologists and others, on the impact that teachers have on students, it is not clear that state officials have the information necessary to formulate effective policies. Few of the studies show specific teacher characteristics—such as years of experience or degree level—to be statistically significant determinants of student achievement.²¹ However, these studies have typically only used school district averages of these characteristics, and thus might miss important differences among schools within a district or teachers within a school. Some studies have included indicators of whether teachers are “certified” but only a few studies have explicitly analyzed the link between licensure and student performance.

A study by Strauss and Sawyer, using statewide data from North Carolina, finds that average school district performance on standardized exams increases with the average performance of school teachers in the district on the National Teacher Exam.²² Similarly, Ferguson finds that, in Texas, where teachers are required to pass a certification exam, school districts with higher average teacher performance on the

To our knowledge, there have been no studies at the individual student level that explicitly examine the relationship between teacher licensure and student outcomes.

exam have higher student performance in mathematics.²³ These findings are important because they suggest that state licensure policies can affect student outcomes. However, there is no guarantee that they do. As noted above, most of the states that require teachers to pass competency exams have set relatively modest hurdles. Thus, it may be that state policies do not have a significant effect on the quality of teachers in the classroom because they are actually doing little to screen out poor candidates. Additionally, many states have only recently overhauled their certification policies, and most exempt existing teachers from the new requirements. Given the long tenure of teachers, it would take many years for changes in state certification policies, if they do not apply to existing teachers, to have a significant impact on students.

To our knowledge, there have been no large scale studies at the individual student level that explicitly examine the relationship between teacher licensure and student outcomes. In this paper, we focus on this issue by critically analyzing the effects of certification. In particular, we determine whether (1) the type of certification a teacher holds, or (2) specific state certification requirements are systematically related to student performance on standardized test scores in mathematics and science.

Methodology and Data

The following are the key questions of our study:

Do teachers with “standard” certification outperform teachers with alternative or probationary credentials in terms of the achievement of students?

Are different components of a state’s system of licensure systematically related to student achievement?

To answer these questions, we employ a statistical technique (multiple regression) that allows us to assess the contribution of various factors (e.g., family income, teacher experience, class size) to explaining students’ scores on twelfth-grade standardized mathematics and science tests. We can use the results from this analysis to determine how scores would be expected to change with a change in any of these factors. For instance, we can predict whether and by how much test scores would rise (or fall) if class size is lowered. We believe students’ test scores can be explained by individual and family background characteristics; school, teacher, and classroom characteristics; and the state’s teacher certification policies.

We use data derived from the *National Educational Longitudinal Study of 1988* (NELS), a nationally representative survey of about 24,000 eighth-grade students conducted in the spring of 1988. A subset of these students were resurveyed in tenth (1990) and twelfth grades (1992). Students provided comprehensive information on themselves and their families (their race/ethnicity, sex, family structure), and the survey was supplemented by a parental survey in 1988 (providing information on, for example, family income). At the time of each survey, students also took one

or more subject-based tests in mathematics, science, English/writing, and history. The unique feature of NELS is that it is structured so that detailed teacher and class level information can be tied directly to individual students by subject. In other words, the characteristics of a twelfth-grade mathematics or science teacher (sex, race/ethnicity, degree level, experience, certification, etc.) who taught students taking the tenth- and twelfth-grade mathematics or science tests are known.

We use various measures of teacher training. We include in all our models whether the teacher has an M.A. or a Ph.D. degree, a professional degree (e.g., an M.D. or D.D.S.) or an education specialist degree (the omitted group is teachers with a B.A. or less). We also employ indicators of whether the teacher's bachelor's or higher degree is in the subject they are teaching or in education (the omitted group is non-subject, non-education). On the NELS twelfth-grade teacher survey, teachers were asked, "Which type of math and science teaching certifications do you hold from the state where you teach?" The response categories were "regular or standard," "probationary" (which is the initial certification issued after satisfying all requirements except the completion of a probationary period), "emergency" (which indicates that the teacher requires additional course work before regular certification can be obtained), "private school certification," and "not certified" in subject. We group the teachers into five categories: those who hold a standard certification in subject, those who hold a probationary certification in subject, those who hold an emergency certification in subject, those who hold a private school certification, and those who are not certified in their subject area. Since the only difference between standard certification and probationary certification is whether or not a teacher has passed the probationary teaching period, we would expect the impact of these teachers on students to be similar.

We are unable to be certain of the extent to which definitions of certification vary from state to state or how individual teachers interpret this question. Further, none of these definitions strictly corresponds to the types of alternative certification discussed above, though we speculate that some teachers with emergency credentials may be pursuing, or have come through, alternative certification programs.

We undertake two types of analyses related to licensure. First, we investigate whether the type of certification a teacher has is related to her students' test-score gains, holding constant their family background and other schooling characteristics. The relative importance of certification compared with other teacher characteristics such as degree level and experience is then ascertained. We would expect that, if there is any value added by standard certification in terms of screening high quality individuals or providing useful training, students with teachers who have no certification or who have emergency certification would do worse on standardized tests. This is certainly the argument made by many proponents of the existing system of licensure.

Our focus here is on licensure in public schools, so our sample of students is restricted to those *students who were in public schools in the twelfth-grade*. It consists of 3,611 students in mathematics, and 2,299 students in science.²⁴ Descriptive statistics

Uncertified math teachers have students with lower test scores, lower levels of parental education and family income, and parents who are far more likely to be absent from the household.

for our NELS mathematics and science samples are shown in Tables 1 and 2. Table 1 shows the mean characteristics of the *students* associated with teachers who have standard subject certification, emergency subject certification, probationary subject certification, and no certification in the subject they teach. We do not show means for teachers with private certification. The first column of the table shows the mean values for students who have teachers with standard certification in their subject, the second column is the means for students with teachers who hold probationary certification in their subject, the third for students with teachers who hold emergency certification in their subject, and the fourth for students with teachers who hold no certification in their subject. For instance, the mean value of family income for math students who have teachers with emergency certification, \$37,451, is found by looking at the family income row and emergency certification column (which is column 3).

Table 1 shows some striking differences in the types of students taught by teachers with different types of certification.²⁵ For example, uncertified math teachers have students with lower test scores, lower levels of parental education and family income, and parents who are far more likely to be absent from the household. Some of these differences are large—for example, there is almost a full standard deviation of difference in twelfth-grade test scores between students whose teachers have a standard certification in their subject and those whose teachers are not certified in their subject. Also, students of teachers who hold a standard certification have an average family income that is at least \$10,000 higher than the average income for students with teachers in the other categories. The overall pattern also holds for math when comparing emergency and probationary teachers' students to those with standard certification.

The patterns are less pronounced in the science sample, although a comparison between emergency/probationary certified teachers and standard certified teachers still shows that students with lower socioeconomic backgrounds tend to get teachers with non-standard credentials. These results provide *prima facie* evidence that students are not randomly distributed across teachers by type of certification. It is also interesting to note that the gain in the math test score from the tenth to twelfth grade is roughly 5 points for students whose teachers hold standard, probationary, and emergency certification, but is only about 2.6 points for students whose teachers are not certified in the subject. A similar pattern holds for science.

Table 2 shows mean school, class, and teacher characteristics associated with individual teachers. The first column of the table shows the mean values for teachers with

Table 1. Means of Selected Student Variables by Type of Certification of 12th Grade Teachers

	(1) Standard Certification in Subject	(2) Probationary Certification in Subject	(3) Emergency Certification in Subject	(4) No Certification in Subject
Math				
Student tenth-grade test score	46.95	38.01	36.56	37.69
Student twelfth-grade test score	52.10	42.99	41.91	40.35
Student is white	.71	.72	.72	.53
Mother's education	13.27	12.50	12.13	11.79
Father's education	13.72	12.18	11.04	12.74
Father not in household	.21	.20	.32	.33
Family income	47,160	35,826	37,451	32,614
Number of students	3,126	25	47	60
Science				
Student tenth-grade test score	23.75	22.91	21.03	24.36
Student twelfth-grade test score	25.71	24.54	23.65	25.60
Student is white	.75	.78	.52	.74
Mother's education	13.48	13.08	12.55	13.64
Father's education	14.04	12.87	13.36	13.77
Father not in household	.21	.13	.22	.13
Family income	50,570	45,565	49,494	47,875
Number of students	1,966	32	42	31

standard certification in their subject, the second column is the means for teachers who hold probationary certification in their subject, the third for teachers who hold emergency certification in their subject, and the fourth for teachers who hold no certification in their subject. For instance, the mean experience level for science teachers who hold a probationary certification in their subject, 3.75 years, is found by looking at the teacher experience row and the probationary certification column (which is column 3).

Our samples consist of 2,101 math teachers and 1,380 science teachers.²⁶ The vast majority have standard certification (84 percent in both mathematics and science). Relatively small numbers of students are taught by teachers with anything other than standard certification. This table illustrates that there are important differences in teachers with different certification status. Teachers with standard certification in mathematics are more likely to be white and more likely to teach in schools with a high percentage of white students and a lower percentage of low income students.

Table 2. Means of Selected School and Teacher Variables by Type of Certification of 12th Grade Teachers

	(1) Standard Certification in Subject	(2) Probationary Certification in Subject	(3) Emergency Certification in Subject	(4) No Certification in Subject
Math				
Twelfth graders white (%)	71.32	52.27	67.39	62.45
Students free lunch (%)	21.48	29.50	28.14	26.27
Minority students in class (%)	26.11	45.95	31.65	41.65
Teacher white	.91	.68	.86	.76
Teacher years experience at secondary	17.98	2.60	6.53	12.80
Teacher has M.A.	.58	.20	.19	.51
Teacher has ed. specialist degree	.13	.05	.06	.04
B.A. major in math	.75	.74	.56	.14
M.A. major in math	.44	.0	.50	.13
Number of teachers	1,766	22	37	49
Science				
Twelfth graders white (%)	73.60	76.86	68.00	75.44
Students free lunch (%)	20.67	21.38	29.91	23.20
Minority students in class (%)	24.29	27.10	29.70	27.99
Teacher white	.93	.90	.91	.91
Teacher years experience at secondary	17.35	3.75	7.22	13.70
Teacher has M.A.	.57	.25	.33	.48
Teacher has ed. specialist degree	.15	.0	.0	.09
B.A. major in science	.69	.81	.43	.20
M.A. major in science	.29	.10	.09	.08
Number of teachers	1,164	21	23	25

Their classes also have fewer minority students. In science, again, the results are similar but less pronounced.

Teachers with standard certification are, on average, highly experienced (almost 18 years of experience in mathematics). Not surprisingly, teachers with other types of certification, who are newer to the profession, have less experience—teachers with probationary certification in mathematics and science have around three years of experience at the secondary level, and teachers with emergency certification have approximately seven years of experience. Similarly, they are less likely to have master's and education specialist degrees. There is a mixed pattern on advanced degrees. For instance, we see that over half of teachers who have a standard certifi-

cation in subject (column 1) have an M.A. degree, but less than a third of teachers with probationary (column 2) or emergency (column 3) credentials hold an M.A.

Since NELS also identifies where the teacher is teaching, we can link — by state — extant information on different features of each state's licensure system with the NELS teacher and student data. We derive information on state licensure policies from a variety of sources including: a 1990 ERIC report on state testing of teachers by Childs and Rudner, the Educational Testing Service, and a report prepared for the Pennsylvania State Board of Education.²⁷ These data contain information on certification requirements compiled for a variety of years beginning in 1982.

Key state licensure features that are identified, at various points in time, include:

Whether a state requires prospective teachers to take a test prior to entering a school of education;

Whether a state requires new teacher graduates to take a test prior to licensing;

The minimum cutoff scores in three tests (mathematics, reading, writing) on the National Teacher Exam and Pre Professional Skills Tests that teachers must achieve prior to obtaining a license;

The percentage of teachers in each state (that has an exam) who pass the state licensure exams (both admission and certification exams);

Whether states require field experience prior to student teaching;

The number of weeks of full-time student teaching required prior to licensure.

Table 3 shows selected state certification information. More than half the states had exams for prospective teachers to take prior to entering a school of education, and about two-thirds had an exit exam for teachers who had completed an education program. Based on the pass rates, these exams do not appear to represent significant hurdles to becoming a teacher: although in some states the pass rates are in the 60 to 70 percent range, the average pass rate across states is closer to 80 percent. Still, we cannot determine whether these tests may affect who tries to become a teacher. For instance, there may be a "screening out" effect of applicants if individuals who might otherwise try to become a teacher decide not to try due to anxiety about passing these exams.²⁸

One significant issue with the NELS data is that we cannot identify the year a teacher obtained his or her certification, nor do we know the state from which the original certification was obtained. This means we cannot be certain that state licensure requirements are properly matched with teachers in the survey. This is a problem because there were significant changes in state policies on testing teachers in the 1980s. For instance, in 1980 only ten states required teacher testing for elementary and secondary schools. By 1990, however, that number had jumped to forty-six

**Table 3. State Certification Requirements as of 1990
(range in parentheses)**

Number of states with admissions tests	27		
Average pass rate entrance exam (10 states)	78.40 (64 to 95)		
Number of states with an exit exam	36		
Average pass rate exit exam (18 states)	84.94 (69 to 97)		
Number of states with exit exam on proficiency in basic skills	26		
Number of states with exit exam on proficiency in professional skills	25		
Number of states with exit exam on proficiency in subject knowledge	24		
	General Knowledge	Communication Skills	Professional Knowledge
Number of states with cutoff scores on the National Teacher Exam	15	15	17
Average cutoff score on the National Teacher Exam	645.20 (639 to 650)	649.20 (644 to 657)	644.18 (630 to 648)
Note: The data in this table are from a 1990 Eric Report.			

states. Some of our data on state licensing (e.g., testing requirements, pass rates, certification cutoff scores) are from the late 1980s, and so a fraction of teachers in our sample who had relatively little experience may have been subject to requirements in place at that time. Many, however, would have obtained licenses prior to this date. Unfortunately, a comprehensive database tracking changes over time in state teacher licensing requirements is not available, so we cannot be sure whether the same requirements were in place when each teacher obtained his or her license. It is possible, for example, that states with "strong" requirements at one time maintained strong requirements in other periods. On the other hand, one could argue that states with poor educational results due to low requirements were most apt to change those requirements. One way we attempt to address this issue is by estimating a variety of models where we focus on relatively junior teachers who likely obtained their certification during a period corresponding to our state certification data.

Results

The results from our statistical models (reported in Appendix Table A-1) indicate the contribution to students' twelfth-grade achievement of specific individual and family background variables, school variables, teacher variables, and class variables.²⁹ We find, consistent with many other studies, that family background characteristics have the largest impact on students' twelfth-grade mathematics and science test

scores. For example, students whose parents have more education and higher incomes also have higher test scores. By contrast, many of the school, teacher, and class variables have effects that seem contrary to expectations. For instance, in both mathematics and science, students with teachers who have a professional degree or a Ph.D. are not found to have higher test scores than students with teachers who do not hold these credentials.³⁰

Consistent with our prior findings pertaining to tenth-grade student achievement, *math students having teachers with bachelor's or master's degrees in mathematics outperform students whose teachers do not hold these credentials.*³¹ For example, the impact on students' mathematics scores of having a mathematics teacher who holds both a B.A. and an M.A. in mathematics is about one point on the twelfth-grade mathematics test. This represents roughly 8 percent of the standard deviation on the test, or *more than a third of a year of schooling.*³² By contrast, we find having a degree in education has no impact on student science test scores and, in mathematics, having a B.A. in education actually has a statistically significant *negative* impact on scores in math. This latter result may seem counterintuitive, but it is not surprising when one considers the fact that most college students selecting education majors tend to be drawn from the lower part of the ability distribution.³³ Given this, "major in education" may serve as a proxy for teacher ability, which has been shown to have an important impact on student achievement.

Turning to an examination of the effect of certification, we find that the type of certification a teacher holds is an important determinant of student outcomes (see columns [1] and [3] of Appendix Table A-1). In mathematics, we find teachers who have a standard certification have a statistically significant positive impact on student test scores relative to teachers who either are not certified or are certified out of subject (in these data we cannot distinguish between no certification and certification out of subject area).³⁴ Roughly speaking, having a teacher with a certification in mathematics results in a two point increase in the mathematics test which represents *more than three-quarters of a year of schooling* (or about 16 percent of the standard deviation on the twelfth-grade test). This is about twice the impact of having a teacher with both a B.A. and an M.A. in mathematics. Teachers with probationary certification have a similar positive impact. In practice, there are a lot of teachers who have both degrees in subject and certification in subject. Thus, what we are comparing here is a teacher who holds B.A. and M.A. degrees in math but no certification with another teacher who holds a certification in math but no degrees in math.

One of the most interesting findings is that *teachers who have emergency certification in mathematics also seem to have roughly the same impact on students as teachers who hold standard certification.* In fact, statistical tests indicate that there is no significant

Teachers who have emergency certification in mathematics seem to have roughly the same impact on students as teachers who hold standard certification.

Overall, we do not find a strong relationship between state certification policies and student outcomes.

difference between the categories. Though the effects are not as strong in magnitude or statistical significance, the pattern in science is similar. Teachers with standard and probationary certification have a positive (though not statistically significant) impact on students' science test scores. Emergency certification in science was found to have a statistically significant positive impact, and statistical tests again reveal no statistically

significant difference in performance between those with emergency and standard certification. The findings with regard to emergency certification are striking because they strongly contrast with the conventional wisdom (put forth by the NCTAF and others) that good teachers only come through conventional routes.

It is likely that the group of teachers with emergency certification is quite heterogeneous. As is apparent from the means (in Tables 2), individuals with these credentials have far less teaching experience and are more likely to be teaching in high poverty schools. It is likely that some urban school systems with poor working conditions find it difficult to hire enough teachers with standard certification, so are forced to hire teachers who have not completed formal training. Our results suggest that, holding all else constant, there is no evidence that teachers with standard certification outperform those with emergency cre-

denentials. Though it is speculative, one explanation for this finding is that teachers with non-standard certification have been more carefully screened by school districts for ability or content knowledge than those with standard certification.

Since licensing is a state function, and requirements vary across states, one might expect the effects of licensing on student test scores to be different for some states relative to others. In fact, we find little evidence of this. Some of our model estimates statistically account for this possibility by assessing the degree to which teacher effectiveness differs by state.³⁵ In these models we continue to see a similar pattern of teacher effectiveness by certification status. For instance, we still see that teachers with emergency and probationary certification perform as well as those with standard certification.

Closer analyses of state effects suggest only modest evidence that they even exist. State licensure policies do not appear to have much direct impact on student outcomes. For instance, measures of how difficult it is to become a teacher in a particular state (such as the Praxis or NTE pass rates, whether a state requires teachers to have field experience prior to student teaching or the number of full-time weeks of student teaching required prior to licensure) are not systematically related to student achievement.³⁶ Several model specifications (in columns (2) and (4) of Appendix Table A-1) do, however, allow for the possibility that there is a relationship between a state's having an admissions test requirement for licensure and the effect of teacher certification in that state.

One might think that tougher certification requirements translates into higher quality teachers, which implies that states with such requirements should have teachers whose students perform better.³⁷ In fact there is little evidence of this. The basic findings that students of teachers with emergency certification perform about as well as those of teachers with no certification holds up in these model specifications; however, there is relatively little difference in performance of teachers with standard licensure in states that require certification tests and those that do not. In sum, we find little evidence linking state licensure policies in the 1980s to student achievement.

These results should be interpreted cautiously because our state admissions and certification test data are from a time when they may not have applied to many of the teachers in our sample. We therefore re-estimated our statistical models using samples of students who had teachers with less than four years of experience (the estimated coefficients from these models are shown in appendix Table A-2). This means that many (though not necessarily all) were subject to these state requirements. The results for mathematics are little changed from the previous regressions which include the full sample, but there are some striking differences in the science sample: students of teachers without subject-specific certification outperform those with subject-specific certification. These findings are somewhat counterintuitive. One possible explanation is that out-of-subject certified teachers tend to be individuals with practical experience in the field of science who have not obtained the credentials necessary for certification. A broad interpretation of the results is simply that certification really makes very little difference, most likely because of the weak nature of most of the requirements.

Overall, we do not find a strong relationship between state certification policies and student outcomes.³⁸ There are several potential explanations for this result. Perhaps the decision by states to impose or strengthen certification requirements may not be random. In other words, it is possible that states with poor student performance are systematically more likely to change certification policies. Our simple multiple regression framework does not take account of this relationship. It is also possible that state requirements do not represent a significant barrier to becoming a teacher and, therefore, do a poor job of screening out weak teachers, or that these requirements actually act to screen out able individuals who might otherwise opt to pursue a career in teaching.

Contrary to conventional wisdom, mathematics and science students who have teachers with emergency credentials do no worse than students whose teachers have standard teaching credentials, all else being equal.

Conclusions

Although teacher certification is pervasive, there is little rigorous evidence that it is systematically related to student achievement. In recent years, many states have adopted more stringent requirements for admission to teacher licensing programs

and entry into the profession. Additionally, some states have increased opportunities for teachers to enter via alternative routes, and other states and localities faced with teacher shortages have increasingly hired teachers on emergency credentials. These trends make the issue of the relative effectiveness of different types of teacher certification and state certification policies an important one. In this paper, we shed some light on the issue using a large, longitudinal student level database. We explore the relationships between twelfth-grade student performance in mathematics and science and various teacher characteristics. Consistent with our earlier research, we find that *teachers with a mathematics degree or certification in subject outperform those without subject-matter preparation*. For instance, teachers with certification in mathematics and those with a B.A. in mathematics outperform those who lack mathematics-specific credentials.

Contrary to conventional wisdom, *mathematics and science students who have teachers with emergency credentials do no worse than students whose teachers have standard teaching credentials, all else being equal*. This result should, at the very least, cast doubt on assertions that standard certification should be required of all teachers.

Our study does not definitively answer the important policy question of whether imposing more rigorous standards in teacher licensure will lead to better student achievement. Such policies may lead to improved teachers. But it is also possible that these standards will restrict the supply of qualified individuals by discouraging them from even trying to become teachers. It is certainly an open question as to whether enough highly qualified individuals can be attracted into teaching at current salary levels. These results leave important questions unanswered. There is some evidence that teachers with different types of credentials are not randomly distributed across students, classes, or schools. This pattern needs to be more systematically investigated with data that contain a nationally representative sample of teachers (e.g., the *Schools and Staffing Survey*). Further, we do not have information that precisely matches teachers with state certification policies. To do so would require both more detailed information on the specific date, location, and content of an individual teacher's certification experience, and more comprehensive information on how state licensing policy has changed over time.

Appendix: Statistical Results

The appendix tables show the impact of specific teacher and state characteristics on student achievement in math and science. The coefficient for each variable shows the magnitude of the effect of a one unit change in that variable on student achievement. The T-statistic which is listed in parentheses next to the coefficient provides a statistical indication of how certain we are that this impact on achievement is different from zero. A higher T-statistic indicates that we are more confident that the variable in question does have an effect. A T-statistic of 2 indicates that we are about 95 percent confident that the effect of a particular variable is different from zero (this is the

**Table A-1. Ordinary Least Squares Estimates of Twelfth-Grade
Standardized Test Score for All Students
(Absolute Value of T-statistic in Parentheses)**

	Mathematics		Science	
	Model Without State Level Variables	Model With State Level Variables	Model Without State Level Variables	Model With State Level Variables
Teacher—years experience	.021 (.17)	.018 (.14)	.014 (.14)	.015 (.16)
Teacher has M.A.	-.461 (.8)	-.390 (.7)	-.488 (1.2)	-.377 (.9)
Teacher has ed. specialist degree	-.558 (1.6)	-.549 (1.6)	-.362 (1.2)	-.320 (1.1)
Teacher has Ph.D.	-.461 (.5)	-.407 (.4)	.716 (.9)	.805 (1.1)
Teacher has professional degree	-.771 (.2)	-.726 (.2)	-3.872 (1.9)	-3.625 (1.8)
B.A. major in subject	.411 (1.7)	.429 (1.8)	-.046 (.2)	-.032 (.2)
B.A. major in education	-.417 (1.9)	-.410 (1.8)	-.179 (.9)	-.253 (1.2)
M.A. major in subject	.548 (1.9)	.557 (1.9)	.108 (.4)	.115 (.4)
M.A. major in education	.139 (.5)	.128 (.4)	.058 (.2)	.105 (.4)
Standard certification in subject	2.098 (3.0)	2.463 (3.3)	.787 (1.3)	.426 (.7)
Probationary certification in subject	2.138 (1.7)	-.564 (.3)	.721 (.8)	-.227 (.2)
Emergency certification in subject	2.324 (2.2)	.622 (.4)	1.453 (1.8)	2.981 (1.9)
Other certification	.708 (.7)	.172 (.1)	-.672 (.8)	3.008 (2.4)
State admissions test x standard certification	—	-.214 (.9)	—	.097 (.5)
State admissions test x probationary certification	—	2.835 (1.1)	—	2.678 (1.9)
State admissions test x emergency certification	—	2.503 (1.6)	—	-1.739 (1.3)
State admissions test x other certification	—	1.452 (1.0)	—	-1.693 (1.5)
State certification test x standard certification	—	-.341 (1.5)	—	.525 (2.9)
State certification test x probationary certification	—	-1.240 (.5)	—	.403 (.3)
State certification test x emergency certification	—	.372 (.3)	—	-.427 (.4)
State certification test x other certification	—	-.435 (.3)	—	-2.720 (2.5)
Adjusted R ²	.85	.85	.66	.66
Sample size	3611	3611	2299	2299

**Table A-2. OLS Estimates of Twelfth-Grade Standardized Test Score
For Students with Teachers with under Four Years of Experience Only.
(Absolute Value of T-statistic in Parentheses)**

	Mathematics		Science	
	Model Without State Level Variables	Model With State Level Variables	Model Without State Level Variables	Model With State Level Variables
Teacher—years experience	.418 (.13)	.437 (.14)	.129 (.6)	.179 (.8)
Teacher has M.A.	3.401 (.8)	4.216 (1.0)	.769 (.3)	.830 (.4)
Teacher has ed. specialist degree	.479 (.1)	.864 (.3)	-.491 (.3)	-.751 (.4)
B.A. major in subject	.138 (.2)	.583 (.6)	-.639 (1.1)	-.773 (1.3)
B.A. major in education	-.455 (.5)	-.116 (.1)	-1.156 (1.8)	-1.175 (1.8)
M.A. major in subject	.566 (.3)	.077 (0.0)	1.686 (1.1)	2.327 (1.4)
M.A. major in education	-1.086 (.6)	-.780 (.4)	.936 (.6)	1.317 (.8)
Standard certification in subject	2.954 (2.0)	3.631 (2.1)	-2.440 (1.7)	-2.285 (1.5)
Probationary certification in subject	4.038 (2.1)	.885 (.3)	-2.338 (1.5)	-3.124 (1.8)
Emergency certification in subject	3.019 (1.6)	.292 (.1)	-2.063 (1.3)	-.248 (.1)
Other certification	-1.538 (.6)	3.152 (.9)	-2.814 (1.5)	-.242 (.1)
State admissions test x standard certification	—	-.192 (.3)	—	-.270 (.5)
State admissions test x probationary certification	—	2.640 (.9)	—	2.744 (1.3)
State admissions test x emergency certification	—	3.330 (1.4)	—	-1.492 (.7)
State admissions test x other certification	—	-7.239 (1.3)	—	.430 (.2)
State certification test x standard certification	—	-.835 (1.2)	—	.043 (.1)
State certification test x probationary certification	—	2.029 (.8)	—	.715 (.4)
State certification test x emergency certification	—	2.340 (1.0)	—	-1.694 (1.0)
State certification test x other certification	—	9.065 (1.6)	—	-4.557 (1.7)
Adjusted R ²	.84	.84	.65	.65
Sample size	785	785	632	632

generally accepted level of confidence to consider a variable "statistically significant"). For instance, the coefficient for teacher-years of experience in the first specification of the math model is 0.021. This indicates that an increase in teacher experience of ten years is predicted to raise students' test scores by 0.21 points (10 times 0.021), an increase of twenty years is predicted to raise students' test scores by 0.42 points (20 times 0.021), and so on. The T-statistic for this variable is 1.7, which suggests we are about 90 percent confident that this predicted effect is different from zero. Notice that a variable might have a large coefficient, as is the case with a Ph.D. variable (the coefficient value is -0.461) but a small T-statistic (0.5). In this case, we would predict a large effect of teachers having a Ph.D., but we are not very confident that this effect does in fact exist.

- ¹ Hamilton Lankford and James Wyckoff, "The Dynamics of Teacher Salary Expense," paper presented at the annual meeting of the Association for Public Policy Analysis and Management, Washington, D.C., November 1997. Darling Hammond notes that half of the teachers who will be teaching ten years from now will be hired in the next decade. See Linda Darling Hammond, "What Matters Most: A Competent Teacher for Every Child," *Phi Delta Kappan* (1996): 193-201.
- ² National Commission on Teaching and America's Future (NCTAF), *What Matters Most: Teaching for America's Future* (New York: Author, 1996).
- ³ Licensure refers to the process by which individuals are granted a credential by the state, assuring the public that the person is qualified to begin practicing in the profession. See M. Stephen Lilly, "Research on Teacher Licensure and State Approval of Teacher Education Programs," *Teacher Education and Special Education* 15, no. 2 (1992): 149-160. In teaching, but not in other professions, this is commonly used interchangeably with the term "certification," which implies a set of standards maintained by a profession.
- ⁴ Linda Darling Hammond, "What Matters Most."
- ⁵ The third question is equally important, but the data we use here do not allow for an examination of this issue.
- ⁶ Sarah E. Turner, "The Training of Teachers: The Changing Degree Output in the Area of Education," paper presented at the 1998 Association of Public Policy and Management Meeting in New York, N.Y.
- ⁷ The Holmes Group, *Tomorrow's Teachers* (East Lansing, Mich.: Author, 1986); Carnegie Task Force on Teaching as a Profession, "A Nation Prepared: Teachers for the 21st Century" (New York: Carnegie Forum on Education and the Economy, 1986).
- ⁸ NCTAF, *What Matters Most*.
- ⁹ M. Stephen Lilly, "Research on Teacher Licensure."
- ¹⁰ C.E. Feistritzer and David T. Chester, *Alternative Teacher Certification: A State-by-State Analysis 1998-99* (Washington, D.C.: National Center for Education Information, 1998).
- ¹¹ Robert P. Strauss, Lori L. Bowes, Mindy S. Marks, and Mark R. Plesko, "Who Should Teach in Our Public Schools? Implications of Pennsylvania's Teacher Preparation and Selection Experience," paper presented at the American Education Finance Association Conference, Mobile, Ala., March 1998.
- ¹² Some states also require prospective teachers to participate in observation of classroom skills, or internships, and others, such as Connecticut, require all new teachers to submit portfolios of their work with students. The Connecticut example illustrates the fact that some states compel teachers to pass additional hurdles after their initial licensure (Feistritzer and Chester, *Alternative Teacher Certification*).
- ¹³ Strauss, Bowes, Marks, and Plesko, "Who Should Teach in Our Public Schools?"
- ¹⁴ Pamela Ferdinand, "Nearly Half of Aspiring Teachers Fail Latest Massachusetts Test," *Washington Post*, 13 August 1998, A6.
- ¹⁵ Jianping Shen, "Has the Alternative Certification Policy Materialized Its Promise? A Comparison Between Traditionally and Alternately Certified Teachers in Public Schools," *Educational Evaluation and Policy Analysis* 19, no. 3 (1997): 276-283.
- ¹⁶ Feistritzer and Chester, *Alternative Teacher Certification*.
- ¹⁷ Linda Darling Hammond, "Teaching and Knowledge: Policy Issues Posed By Alternate Certification for Teachers," *Peabody Journal of Education* 67, no. 3 (1990): 123-154.
- ¹⁸ Feistritzer and Chester, *Alternative Teacher Certification*; Shen shows that teachers with alternative certification are more likely to be minority and younger and more likely to teach in secondary schools than are those with standard certification. See Jianping Shen, "Has the Alternative Certification Policy Materialized Its Promise?" Prior to becoming teachers, those with alternative certification were far more likely to have held a non-teaching job. However, it is not clear that teachers accurately categorized the route by which they entered teaching. Ballou notes that follow-up interviews by the National Center for Education Statistics indicate a significant amount of

- response error to the question about teacher certification (Dale Ballou, "Alternative Certification: A Comment," *Educational Evaluation and Policy Analysis* 20 no.4 (1998): 315). He also notes that it is seemingly contradictory that many of those teachers who say they are alternatively certified also report having a B.A. in education. However, in a response to Ballou, Shen cites evidence that the response variance for the questions used in his data were within the acceptable range for the analyses and that many of those with alternative certification, who did not hold a B.A., likely earned a B.A. in education in the process of becoming alternatively certified. See Jianping Shen, "Alternative Certification: A Complicated Research Topic," *Educational Evaluation and Policy Analysis* 20 no. 4 (1998): 316-20.
- ¹⁹ Stephen D. Goebel, Karl Ronacher, and Kathryn S. Sanchez, *An Evaluation of HISD's Alternative Certification Program of the Academic Year: 1988-1989* (Houston: Houston Independent School District Department of Research and Evaluation), ERIC Document No. 322103 (1989); Susan Barnes, James Salmon, and William Wale, "Alternative Teacher Certification in Texas," paper presented at the annual meeting of the American Educational Research Association, March 1989, ERIC Document No. 307316.
 - ²⁰ Even a majority (63 percent) of education professors, those responsible for training the nation's teachers, admit that education programs often fail to prepare teachers adequately. See Steve Farkas and Jean Johnson, *Different Drummers: How Teachers of Teachers View Public Education* (New York: Public Agenda, 1997).
 - ²¹ Eric Hanushek and Richard Pace, "Who Chooses to Teach (and Why)?" *Economics of Education Review* 14, no. 2 (1995): 101-117.
 - ²² Robert P. Strauss and Elizabeth A. Sawyer, "Some New Evidence on Teacher and Student Competencies," *Economics of Education Review* 5, no.1 (1986): 41-48.
 - ²³ Ronald Ferguson, "Teachers' Perceptions and Expectations and the Black-White Test Score Gap" in Christopher Jencks and Meredith Phillips, eds., *The Black-White Test Score Gap* (Washington, D.C.: Brookings Institution Press, 1998).
 - ²⁴ Students were sampled in two of the four subject areas so there may be cases where the same individual appears in both our science and math samples.
 - ²⁵ The survey asks what type of certification a teacher holds—standard, emergency, probationary, other (private), or none in subject.
 - ²⁶ The tables exclude 227 mathematics teachers and 147 science teachers with "private school certification."
 - ²⁷ Ruth A Childs and Lawrence M. Rudner, "State Testing of Teachers: The 1990 Report," *Eric Digest* (December 1990); Data from the Educational Testing Service are available at <http://www.edweek.org/htbin/fastweb/>; Robert P. Strauss, "Teacher Preparation and Selection in Pennsylvania: Ensuring High Performance Classroom Teachers for the 21st Century," report to the Pennsylvania State Board of Education, 1998.
 - ²⁸ Dale Ballou and Michael Podgursky, *Teacher Pay and Teacher Quality* (Kalamazoo: W.E. Upjohn Institute, 1997).
 - ²⁹ The individual and family background variables include sex, race/ethnicity, parental education, family structure, family income, and tenth-grade subject test score. School variables include urbanicity, dichotomous variables identifying region, school size, the percentage of students at the school who are white, the percentage of students at the school who are from single parent families, and the percentage of students at the school who are on free or reduced lunch. Teacher variables include sex, race/ethnicity, years of experience at the secondary level, the teacher's degree level, and the type of teacher certification. Class level variables include class size and the percentage of minority students in the class.
 - ³⁰ Female teachers are associated with lower test scores; the relationship between teacher race, ethnicity and gender and student scores is likely more complex than this simple linear model allows but we do not explore the issue here. For a more detailed analysis of this issue, see Ronald G. Ehrenberg, Dan D. Goldhaber and Dominic J. Brewer, "Do Teachers' Race, Gender, and Ethnicity Matter? Evidence from NELS88," *Industrial Labor Relations Review* 48, no.3 (1995): 547-561.
 - ³¹ Dan D. Goldhaber and Dominic J. Brewer, "Why Don't Schools and Teachers Seem to Matter? Assessing the Impact of Unobservables on Educational Productivity," *Journal of Human Resources* 32, no.3 (1997): 505-523.
 - ³² This figure is based on a two-year mean gain on the math test of roughly 5 points.
 - ³³ Eric A. Hanushek and Richard R. Pace, "Understanding Entry into the Teaching Profession," *Economics of Education Review* (1995)
 - ³⁴ Given that almost all public school teachers are certified, most of these teachers likely are certified out of subject.
 - ³⁵ They control for this possibility by including "fixed-effects" which account for the possibility that there are important characteristics that vary by state, such as the preference for education, and that we cannot readily observe in the data. If there is a systematic relationship between state effects and our certification variables, we would expect our coefficient estimates to change in this specification of our model. The results of these specifications are not reported because they are so consistent with the model results reported in Columns (1) and (3) of Appendix Table A-1.
 - ³⁶ These model specifications are not reported, but are available from the authors upon request.
 - ³⁷ In the models shown in the appendix, the total effect of having a teacher with standard certification in a state with no admissions test requirement, for example, would be the estimated coefficient of that variable. The total effect of having a teacher with standard certification in a state that had an admissions test would be the sum of the estimated coefficient of standard certification and the estimated coefficient of the interaction variable ("state admissions test x probationary certification" in the table). A similar interpretation can be given to the effects of other types of certification.
 - ³⁸ Though many of the coefficient estimates are not statistically significant, the magnitudes of the coefficients are, in some cases, quite large.

³⁹ All regression models include individual and family background variables; school and class level variables; dummy variables for missing values of parental education, parents not in household, family income, percentage of students in the school who are white, percentage of students in the school from single parent households, the percentage of students in the school on free or reduced lunch, class size, the percent minority in the class, teacher race and gender, teacher experience, teacher degree level, teacher major, teacher certification.

All regressions include individual and family variables, and school level variables. The omitted degree category is B.A. The omitted major is non-education and non-subject. The omitted certification is certification out of subject and no certification.

⁴⁰ All regression models include individual and family background variables; school and class level variables; dummy variables for missing values of parental education, parents not in household, family income, percentage of students in the school who are white, percentage of students in the school from single parent households, the percentage of students in the school on free or reduced lunch, class size, the percent minority in the class, teacher race and gender, teacher experience, teacher degree level, teacher major, teacher certification. We do not report teacher Ph.D. or professional degree because there were no teachers in these samples with these degrees.

Who Gets Hired to Teach? The Case of Pennsylvania

Robert P. Strauss

This report takes a close look at teacher preparation and hiring practices in Pennsylvania, and then considers the qualifications of those who ultimately emerge from the process and are hired to teach in the state. It reviews in detail the various factors that conspire to produce a poorly qualified teaching force: low admissions standards for prospective teachers; vague curricular requirements at teachers colleges; low cutoff scores on licensing exams; and misguided (and sometimes questionable) hiring practices that place little emphasis on an applicant's content knowledge. While the weaknesses of preservice teacher training are not unfamiliar, Strauss contends that the flaws in the hiring process itself turn out to be so great that they may overwhelm even an improved preparation system.

Introduction

In the summer of 1998, Paul Cellucci, Acting Governor of Massachusetts, publicly proclaimed his dismay over the poor performance of prospective teachers on standardized examinations; 59 percent of them had failed at least one part of this examination, which was developed by National Evaluation Systems for the Massachusetts Department of Education. After his successful election in November, Cellucci reiterated his call to the legislature to fund the testing of already-employed teachers to find out what they know.

According to *Education Week*, in the second round of mandatory test-taking, 55 percent of first-time Massachusetts test-takers passed the entire exam; 81 percent passed the reading module, 75 percent passed the writing module, and 68 percent passed their subject matter tests.¹ Despite these substantial performance improvements over those in the first round, Governor Cellucci continues to call for the testing of veteran teachers as well. However, Stephen Gorrie, president of the 84,000 member Massachusetts Teacher Association, the NEA affiliate, says his union will "vigorously oppose" such testing. When Massachusetts Senator John Kerry was an announced presidential candidate, he made the teacher quality issue a campaign issue. Several proposals are circulating that would close down any Massachusetts

school of education in which more than 20 percent of teacher candidates fail the exam.

As our century closes, most governors, responsible along with their legislatures for fulfilling their states' constitutional obligation to provide public education, recognize that continued prosperity will increasingly depend on how well educated their children are. The link from children's education to what they are taught and the quality of those teaching is well understood. Making sure that classroom teachers know and can effectively teach more demanding material, however, is no simple matter, and one that states are struggling with.

My purpose here is to explain how one state prepares its teachers for the public school classroom, describe who in fact gets hired and why, and discuss in practical terms what is involved in improving the quality of classroom teachers.

Pennsylvania was chosen as the case study because I have been examining and writing about it for better than a decade. This research is unusual because it has been done with all of the pertinent administrative records of the state under signed confidentiality agreements. A longer monograph, which I developed for the Pennsylvania State Board of Education in 1997 and which was publicly released in July 1998, supplies the basis for this essay.

The section that follows this one lays out the basic facts of how Pennsylvania colleges and universities offer state-approved course work so that their students can become licensed public-school teachers. It also discusses key variables or policy decisions that affect the nature or quality of the classroom teacher.

The third section describes who actually gets hired to teach, and examines their quality in terms of standardized-test scores. It also describes the results of a unique survey of Pennsylvania school hiring practices, and relates varying practices to different measures of student achievement.

The final section analyzes conventional and unconventional strategies to improve the quality of classroom teachers.

Because of space limitations, I do not confirm via a literature review the common sense notion that students assigned to teachers with more subject knowledge are students who themselves perform better in the subject matter when independently tested.²

I caution the reader that, as between analysts who conclude that the teacher quality problem is due to teachers never having learned how to teach properly (i.e., not having been properly instructed in pedagogy), and those who conclude that the problem stems from their never having learned their subject matter (i.e. not having achieved proper content knowledge), I fall squarely into the second camp.³ Also, among those who opine on how to improve teacher quality, I tend to emphasize

Making sure that classroom teachers know and can effectively teach more demanding material is no simple matter.

more than other analysts the importance of the hiring decision as contrasted with simply improving the pool of applicants.

Teacher Licensing in Pennsylvania

Several state agencies are involved in teacher licensure. All derive their authority from the state constitution and acts of the General Assembly.

The Pennsylvania School Code and Code of Regulations are the official legal documents implemented by the Governor and Pennsylvania Department of Education (PDE).⁴ Legislative action can supersede any regulatory proposals by the Executive Branch or State Board of Education. This means that any attempts to alter teacher licensure requirements through the regulatory process can be impeded by interest groups (e.g., teachers unions, school board associations, etc.) that appeal to the General Assembly.

State licensing procedures for teachers have gone through several metamorphoses since the turn of the century. Elsbee observed in 1939 that teacher reform in the first third of this century involved centralization of the licensing function in the state department of education, the substitution of approved training for examinations, and the differentiation of certificates according to the nature of the teachers' preparation.⁵

In the years since Elsbee noted these trends, fashion and practice in a number of areas have changed. For example, teacher testing has again become widespread since the mid-1980s and is now used in conjunction with program approval to verify that prospective teachers know their subject matter at some competency level. Central licensing within state departments of education has been replaced in some states by independent licensing bureaus that report directly to legislatures and are separately funded.

State education agencies have evolved to deal with the regulatory standards that a college or university must meet for its teacher preparation program to be approved; with the requirements for student teaching; with the definition of core areas of teacher knowledge to be tested through standardized examinations and the setting of passing scores for those exams; with ongoing professional development requirements; and with procedures for revocation and suspension of certification.

Certification

Pennsylvania is one of thirty-nine states that require prospective teachers to earn a degree at a state-approved college or university. Unlike many states, however, Pennsylvania does not stipulate what courses the candidate must take. Rather, the state relies on PDE's program approval process to review each institution's requirements or curricula. Pennsylvania education regulations currently do not stipulate any admissions requirements for teacher preparation programs, although the prospective teacher must pass standardized general and subject matter tests produced by the

Educational Testing Service.⁶ Thus, most of the quality control is imposed by the teacher preparation institution itself with little state supervision or oversight.⁷

Teacher preparation programs may be reviewed at any time by PDE but reviews must be conducted at five-year intervals. Programs must meet both general and specific standards. The major general standards for approval include the following: the institution's education faculty shall have experience at the elementary, secondary, supervisory, or administrative level commensurate with the candidate's area of study; the institution shall document policies for admission into, retention in, and completion of a program⁸; the institution must encourage nontraditional students; the general education portion of a certification program should be equivalent to at least one-third of a baccalaureate degree and should include studies in the arts, humanities, and the natural and social sciences; the program will address issues of diversity and multiculturalism; and the instructional certification program shall require professional studies in teaching methodology (e.g., human development, historical issues in education, developmental reading and reading in the content area, instructional resource identification, and computer literacy).

PDE regulations also govern the specific standards that each program must satisfy in order to be approved. For example, a biology program must include the study of living materials in laboratory as well as field, and the interaction of biology with ethical and human implications in areas such as genetic screening, cloning, organ transplant. An approved program in elementary education requires study of the process of language acquisition and the measurement and evaluation of learning in the cognitive, psychomotor, and affective domains, among other things. During student teaching, the candidate must demonstrate competency in these areas.

Individuals seeking to become certified as teachers in Pennsylvania must be of good moral character; produce a physician's certificate verifying that they possess the mental and physical capabilities required for teaching; attain the age of eighteen; earn a baccalaureate degree (exceptions involve temporary and vocational certificates); and complete an approved program of teacher education.

Certification in Pennsylvania involves two stages: provisional and permanent. The provisional certificate is valid for six service years. Candidates must pass the Pennsylvania Teacher Certification Test, which consists of four areas: Basic Skills; General Skills; Principles of Learning and Teaching, K-6 or Principles of Learning and Teaching 7-12; and Specialization Areas (see discussion below).

Movement from a provisional to permanent certificate requires completion of an induction program developed by the school district; twenty-four semester hours of course work beyond the baccalaureate; six credit hours every five years in department-approved in-service education courses, collegiate studies, or studies at

Moving prospective teachers from schools of education to academic departments to obtain their subject matter training will no doubt be an improvement.

degree-granting institutions every five years; and satisfactory completion of three years of service.

In order to be certified to teach a particular subject, the candidate must fulfill a program of study that the college has stipulated will meet the specific program approval standards, and that has been approved by PDE. The teaching certificate contains an *endorsement* by the state which certifies that the teacher is legally qualified to teach in the particular subject area. (Separately, PDE states what endorsements are required to teach specific courses at specific grade levels.) Endorsements require graduation from an approved program and passage of the appropriate subject test.

The emergency certificate is endorsed for a single subject. It is issued only at the request of an employing public-school entity or the equivalent. The chief administrator of the requesting entity must certify that he has exhausted all reasonable avenues and has not located any properly certified applicant. Applicants for emergency certificates must meet a state health requirement, U.S. citizenship requirement, have a bachelor's degree; pass the Professional Skills Test; and not have been terminated from a position in a public school.

An intern certificate is valid for three calendar years. It is designed to allow entry into the teaching profession for qualified persons who already possess a baccalaureate degree. The candidate must complete an approved certification program's pre-admission screening and be accepted into the program. He must pass the basic skills, general knowledge, and subject matter area portion of the test. Upon completion of his internship, the candidate must pass either the Praxis Principles of Learning and Teaching K-6 for Elementary and Early Childhood Education or the Principles of Learning and Teaching 7-12 for secondary areas before receiving a provisional certificate. Continuous enrollment and satisfactory progress in a Teacher Intern Program lead towards a Level I Certificate.⁹

Details that Matter

Having shown some major components of Pennsylvania's regulations, let us now review them with a careful eye.

For the past six months, the Governor and Pennsylvania Department of Education have been engaged in protracted negotiations with the Pennsylvania Association of Colleges of Teachers Education (PACTE) over moving from the program approval standards described above to new standards based on requiring a full college major (e.g., that prospective biology teachers take the same course work as a true biology major), and both admissions and graduation grade point average requirements.

While such a change has enormous merit, whether it becomes state policy will depend on the tenacity of policymakers to insist that a biology teacher must know biology, and the willingness of education schools to suffer what they claim will be catastrophic reductions in overall enrollment to allow this to happen.

Moving prospective teachers from schools of education to academic departments to obtain their subject matter training will no doubt be an improvement. There are, to be sure, all kinds of biology departments, and all kinds of required course work to become a biology major. Still, this is a minor concern compared to what current program approval standards permit.

The vagueness in today's standards also means that the Department can choose to enforce them more or less leniently. Teacher preparation can be a lucrative activity for a college or university, and there are significant tensions over market share. The combatants are the private colleges and universities, which receive no state subsidies, versus the fourteen state-supported former normal schools whose state appropriations are their fiscal lifeblood, along with the three state-related universities (University of Pittsburgh, Penn State, and Temple) which receive substantial state appropriations and engage in significant teacher training. Considerable pressure is applied when gubernatorial administrations change to place a champion in the position of Deputy Secretary for Higher Education in the Pennsylvania Department of Education. That person has primary authority to approve or disapprove a program and substantial leeway to do what he or she wants.

***Vague state
curricular
requirements
virtually
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in the teacher
knowledge base.***

Comments on Program Standards

Note that there are few restrictions or prescriptions about the faculty of an approved program. They need not be expert in the subject areas in which prospective teachers wish to teach. The only requirement is that some must have experience in the public schools.

There is no obligation for the faculty to have Ph.D.'s or engage in scholarly research, and there is no mention of what the tenure track faculty should have by way of education background or expertise, as contrasted with what the adjunct faculty must have. Requiring, in effect, that only former school teachers teach prospective teachers has the effect of ensuring that current classroom practices will be perpetuated.

The specific program standards are also problematic. The curricular requirements for a biology teacher merely require him or her to take studies with living materials in the laboratory as well as to have field experiences. These "requirements" could encompass almost anything. First, "studies" are not credit hours. Second, living materials could be studied by simply going to a zoo and looking at animals! Third, simply requiring a college or university to require "...studies or experiences in..." without providing time or credit requirements encourages the training institution to economize on faculty and student time.

Not detailing the composition of particular studies, such as what must be included in the content of a chemistry or cellular biology course, means that the requirements

might be met with a few survey courses. The effect of structuring curricula requirements in this fashion is to put the obligation for oversight and quality control on the education department in the college or university rather than on the state agency's shoulders.

Such vague state curricular requirements virtually guarantee wide diversity in the teacher knowledge base. One can envisage a college education department, facing financial pressures, that cuts the number of specialized biology courses, and substitutes survey courses. The "...studies of and experiences in..." test would still be met.

Europeans enforce much stricter standardized testing for prospective teachers. In France, no more than 15 percent pass the most demanding certificate examination.

Such vagueness actually gives local school districts almost complete discretion in hiring. Consider what these vague standards mean for Pennsylvania's 106,000 current classroom teachers. Given that virtually all of them are tenured, what they had to learn to earn a teaching certificate is what they know today. And given reciprocity among the states, such low standards mean that other states hiring teachers who meet Pennsylvania's low requirements face equal uncertainties.

Admissions Standards

Pennsylvania requires each college education department or education school to have admissions and retention requirements, but does not specify what these must be. For example, there is no state requirement that only those earning a bona fide high school-diploma may be admitted into an approved teacher preparation program.

More importantly, Pennsylvania does not stipulate as part of its program approval requirements any minimum score on the American

College Test (ACT) or Scholastic Assessment Test (SAT).¹⁰ Connecticut, by contrast, requires that applicants demonstrate minimum passing scores on one of several examinations. If the student offers the SAT, for example, he must have a combined SAT score in excess of 1,000 (with neither portion falling below 400). In 1997, a combined SAT score of 1,000 was at the 50th percentile. This is not very high, but it is a standard.

Passing the Tests

Pennsylvania, like most states, requires that prospective teachers earn passing scores on various standardized tests. This requirement was first established in 1987 when the General Assembly directed the Department of Education to require standardized tests of teachers; however, the passing test scores are set by panels of Pennsylvania teachers, not by the independent agency that constructed the tests. These passing scores were kept so low that, historically, about 95 percent of those taking the tests passed them.¹¹

High pass rates on standardized exams can mean several things: the test is easy, the passing score is set very low, and/or the candidates taking the test are all highly qualified. Remarkably, Pennsylvania was unable for ten years to set any passing scores for chemistry and physics, the result being that everyone who took these tests, and passed the general skills tests required of all prospective teachers, was awarded a chemistry or physics certificate.

Such high passing rates cannot be found in other areas of professional licensure. It is common for fewer than half of those taking the national CPA exam to pass all parts, and about the same for those taking state bar exams. Europeans also enforce much stricter standardized testing for prospective teachers. In France, no more than 15 percent pass the most demanding certificate examination.¹²

Emergency Certificates and Waivers

Issuance of emergency certificates is the primary mechanism by which local superintendents circumvent Pennsylvania's modest certification requirements. This essentially allows a local superintendent to hire whomever he wishes and this permits the employment of either more or less academically qualified teachers. My understanding of actual practice in Pennsylvania is that it is typically used to deal with demands by school board members and other interested members of the community to hire particular individuals regardless of their academic qualifications.

The key to see how this can happen is to consider carefully the phrase "...no fully qualified AND properly certified applicant available..." Since the term "fully qualified" is not defined anywhere in the regulations, the local superintendent may interpret it to mean whatever he needs to in order to achieve his hiring objective. The superintendent merely has to plead with the state certification bureau, typically a few weeks before the start of classes, to issue the emergency certificate, and assert that he could not find anyone who is fully qualified. Swamped, and perhaps receiving supporting evidence from other interested parties, certification bureau officials get pressured into granting local officials what they ask for.¹³

Michigan, by contrast, requires the Superintendent of Public Instruction to find that the education of children is at risk should an emergency certificate not be granted. That mechanism makes the education of the children the decision criterion, and requires the state to make a positive finding about the relationship between the children's education and the applicant for the emergency certificate rather than requiring a state official merely to weigh a local official's plea on behalf of the noncertificated applicant.¹⁴

The supply of new teaching certificates continues to exceed the aggregate demand.