

WHO SHOULD BE ACCOUNTABLE FOR WHAT BEGINNING TEACHERS NEED TO KNOW?

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Who should be accountable for what beginning teachers need to know? This article first explains and illustrates three sets of knowledge and skills beginning teachers should have acquired in their preparation programs: academic knowledge needed for teaching the field of their license, generic professional knowledge and skills needed for teaching any subject, and license-specific professional knowledge and skills needed for teaching the field of their license. The article then argues that the wrong faculty is held accountable for the most important things beginning teachers of core subjects from Grade 5 to 12 need to acquire—deep knowledge of the subject they teach and a beginning understanding of how to teach it—and that their preparation programs are approved by agencies with no valid basis for making judgments of these crucial details. It concludes with suggestions for restructuring teacher preparation and assigning accountability where it belongs.

Keywords: *accountability for teacher preparation; teachers' academic qualifications; teachers' pedagogical knowledge; teacher education reform*

The question of what beginning teachers need to know often triggers a one-size-fits-all laundry list. But such a simplistic list does a disservice to K-12 students. In 1999, I was put in charge of revising the state's regulations for teacher licensing and program approval at the Massachusetts Department of Education. The directive I had received from the commissioner of education and the board of education was to increase academic expectations for all prospective teachers through a complete revision of the licensing regulations. However, as department staff and I reviewed the requirements for each license, I regularly had to ask two questions: Beginning teacher of whom? and Beginning teacher of what? Teachers do not just teach a subject. They are licensed to teach a particular subject to students at a particular educational level. And what they need to know differs as much by educational level as by subject area. The high school teacher of calculus needs to

know far more mathematics than does the second-grade teacher of arithmetic. What the teacher of English language learners needs to know and to teach differs from what a teacher of deaf or hearing-impaired children needs to know and to teach, and what each teaches differs at the elementary and secondary level, even if the pedagogy in each area is still in dispute.

The directive I had been given stemmed from the results of two sets of tests given for the first time in Massachusetts, one for students and one for teachers. Both tests had been mandated in 1993 by an overwhelmingly Democratic legislature. The low scores on the first statewide student assessments in 1998 shocked the public, but the results of the first teacher tests in 1998 stunned them—almost 60% of all prospective teachers completing licensure programs that spring failed a subject matter test as well as a test of reading and writing skills. There was a common consensus that new teachers needed

much stronger academic preparation if they were to pass their licensure tests and teach to the state's new K-12 standards. Hence, a drastic revision of the state's licensing regulations was in order. The goal my staff and I shared was to try to ensure that new teachers in Massachusetts begin with both the subject matter knowledge and the professional knowledge and skills that would be deemed reasonable for the subject area(s), target population, and educational level of the license they earn.

We decided on two different sets of expectations for the regulations: the academic topics that future teachers should study for the license they sought and the generic professional knowledge and skills they should start acquiring in their training programs. We also laid the groundwork for a third set of expectations: the license-specific pedagogical knowledge that prospective teachers should also begin acquiring but that would be spelled out in guidelines, not in the regulations themselves. The department had never before offered guidelines on license-specific pedagogical knowledge, but I had taught both third grade and French and German at the high school level and believed that generic professional knowledge is not enough.

In this article, I explain the distinctions among these three sets of expectations with examples from the state's regulations for two fields (see Appendices A, B, and C). I also explore several other questions that arose as we revised the regulations for program approval and reviewed the results on the teacher tests after each administration of the tests in 1998 to 2000. Who is responsible for teaching prospective teachers the topics and skills for each license? Who evaluates student teachers on the extent to which they are in command of these topics and skills? Who is held accountable for teaching them? And what kind of evidence is required? I conclude by arguing that at present, we hold the wrong faculty accountable for the most important things beginning teachers of core subjects from Grade 5 to 12 need to acquire—a deep knowledge of the subject they teach together with a beginning understanding of how to teach that particular subject. We also

require approval of their training programs by agencies with no valid basis for making judgments of these crucial details. The right faculty needs to be accountable for the preparation of new teachers, and their academic and pedagogical competence vouchsafed by those who should be accountable.

ACADEMIC EXPECTATIONS FOR BEGINNING TEACHERS

Along with many legislators, other educational policy makers, and probably most parents, I maintain that the first and most important component of what beginning teachers need to know is the academic content that supports the teaching of the field(s) of their license. This view seems to be shared by major government agencies (e.g., National Science Foundation, U.S. Department of Education, National Endowment for the Humanities), federal programs such as Teaching American History and the Reading First initiative, as well as nonprofit private organizations (e.g., the Center for Civic Education) now funding at a staggering cost to the taxpayer the professional development of current teachers of mathematics, science, history, political science, and reading in the academic content of their fields. In fact, for many legislators and other educational commentators today, a deep knowledge of the academic content supporting the field of the teacher's license is the sine qua non for defining teacher quality. Hence, there has been a growing movement nationally to require prospective teachers to pass a subject matter test as well as a test of reading and writing skills for licensure. The Massachusetts Education Reform Act of 1993 requires prospective teachers to take both types of tests. It does not require a test of pedagogy too; apparently, legislators did not see that as the problem.

The current emphasis on assuring the academic qualifications of a prospective teacher is as much a response to a message that has come from teacher educators for decades as it is to the subject matter deficiencies perceived in the graduates of their licensure programs. Large numbers of teacher educators still downplay the significance of the academic course work a

prospective teacher needs. For example, a resolution on an “equity policy” unanimously approved in 1998 by Division K of the American Educational Research Association contains an exceedingly long list of things that teacher education programs should advocate or address to improve the education of all students (Sapon-Shevin, 1999). It is stunning that the only thing the resolution fails to include is the need for teachers to be academically competent in the field of their license. The critical role of academic knowledge is underscored in the schools themselves by what is universally regarded as the problem of out-of-field teaching (allowed in most if not all states for no more than 20% of a teacher’s teaching load). The problem is a teacher’s lack of an adequate academic background for teaching a subject not in his or her field (e.g., Ingersoll, 2004). The pedagogical skills a teacher of one subject is presumed to have acquired as part of a training program and through teaching experience are not viewed by anyone as trumping the academic background needed for teaching another subject.

That the academic base for a particular license trumps professional knowledge or skills is further implied by the requirements for “adding” a license. In Massachusetts, the basic requirement for a teacher of subject X who wishes to add a license for teaching subject Y is to pass the subject matter test in Y. So far as I am aware, states do not require a licensed teacher of X to take a methods course in teaching Y to add a license to teach Y. The assumption that seems to govern adding a subject area license—that the pedagogical skills needed for teaching one subject are adequate for teaching another (at the same educational level)—has not been challenged anywhere to my knowledge, and definitely not in Massachusetts. When the proposed regulations in the Bay State went out for public comment during 2000 (and more than once), at no time did responders, ranging from professional educational organizations, teacher unions, education school faculty, and practicing teachers to special interest groups, suggest that license-specific methods courses needed to be required for adding a license, in addition to passing a license-specific subject test. And

many of these responders (especially the teacher unions) scrutinized every line in the proposed regulations with a magnifying glass. All that needed to be ensured, apparently, was a minimal command of the academic knowledge needed for teaching the second subject (which is about all most current subject tests assess, given their cut scores and level of difficulty).

It is fortunate that we have a body of research to guide us on this issue. As Goldhaber (2004) noted, the evidence suggests a positive relationship between teacher quality and student achievement. What is the key element in teacher quality? Goldhaber also noted that although a much smaller body of research exists on the relationship between student outcomes and academic proficiency as the key element of teacher quality, this body of research is “more definitive in showing a relationship between measures of academic proficiency and teacher quality” (p. 91). In other words, teacher quality is best defined, so far, by a measure of academic proficiency, and “teachers with higher levels of academic proficiency are more effective” (Goldhaber, 2004, p. 91). This is a matter of common sense as well. How can a teacher teach what she or he does not know—or know well? That is one reason why the department, with the assistance of academic experts in the subject matter of every license, delineated the general areas of knowledge that undergraduates seeking a teaching career should address, whether in required courses for a major or as electives.

Appendix A shows the academic topics that future teachers are expected to study for licenses in history and mathematics. These lists simply outline the academic content that experts have judged is necessary for teaching to the state’s demanding K-12 standards in these subject areas. Topics required for study for other licenses are in the *Massachusetts Regulations for Educator Licensure and Preparation Program Approval* on the department’s Web site (www.doe.mass.edu). As noted in the regulations, the topics do not necessarily indicate individual courses or signify weights on a licensure test.

The department spelled out the academic topics for each field for another reason. Previously, a rule of thumb guided prospective teach-

ers and their advisors. Secondary teachers have generally been expected to have a major or a minor in the subject(s) they teach (and they still are). But in the long distant past, there was an implicit academic consensus about the requisite content of the major or a minor for most academic disciplines, and that content was implicitly judged adequate for a prospective secondary teacher of that discipline. Today that consensus does not exist, especially in the humanities. It is no longer clear what content an English major covers, if indeed there still is an English department in all of a state's colleges and universities. One also cannot assume that whatever a particular faculty decides constitutes a major or a minor in history will give potential teachers of that discipline an adequate background for teaching to the state's K-12 standards in that subject area—and to the full range of students possible at the grade levels covered by the license. Spelling out the topics for a field in some detail addresses these problems.

GENERIC PROFESSIONAL STANDARDS AND GENERIC EVALUATION QUESTIONS

A new teacher is also expected to possess a rudimentary understanding of generic professional knowledge and skills. But here one is unlikely to find much variation across teacher preparation programs. Just about every standard in the five categories of professional standards for teachers in the regulations (see Appendix B) could have been suggested by anyone with even a remote understanding of what teachers should be able to do in their own classrooms, regardless of subject matter and grade level. I helped to write all of them, but they could have been generated almost entirely on the basis of common sense alone. It is, thus, not surprising that almost everyone who examined the public comment draft of these professional standards in 2000 agreed with most of them without qualification, which is why they almost painlessly became the state's professional standards for teachers. But unlike a teacher's general academic competence or specific subject matter knowledge, these skills cannot as a whole be defended on the basis of research.

There seems to be no body of sound empirical research showing clear differences in teacher effectiveness in favor of traditionally prepared and licensed teachers (who by definition have taken course work in pedagogy) in contrast to those who have come into teaching via an accelerated (alternative) route (who by definition have taken little or no initial course work in pedagogy). Based on his review of these studies, Goldhaber (2004) concluded that "research on this issue is sparse and often methodologically flawed, and therefore too weak to support strong conclusions" (p. 92). Goldhaber also noted that few studies looking at the relationship between student outcomes and traditional licensure use appropriate controls for different socioeconomic groups.

It is interesting that Podgursky (2004) found a few studies showing a correlation between supervisors' evaluations of teachers and teacher effectiveness as defined by student outcomes. But we do not know whether the teachers' skills were learned earlier, in a training program, or on the job from a supervisor or more experienced colleagues. For a case to be made in favor of traditional training programs independent of later data on student outcomes (and these outcomes could include other measures of student learning in addition to scores on tests of academic achievement), we would need to know (a) that the skills were introduced in methods courses (in addition to being listed on a course syllabus) and (b) that field supervisors and supervising practitioners were in agreement that student teachers in the program had beginning knowledge of these skills and practiced them to a reasonable extent.

To determine this, we would need a common evaluation instrument providing the criterial questions supervisors might ask to judge whether their student teachers have these skills. What observable behaviors or activities constitute evidence, in addition to the documentation a student teacher might prepare for a portfolio? Only two of the five categories of professional standards in the Massachusetts regulations, for example, depend on evidence provided by the student teacher, perhaps in a portfolio. The most important categories—delivers effective

instruction, manages classroom climate and operation, and provides equity—depend on observations by field supervisors and the supervising practitioner.

But to my surprise, I found no common set of criterial questions used by the state's licensure programs in 1999 for judging how well student teachers address professional standards in a practicum in relation to the content of the education courses they take before or during the practicum. In the late 1970s, when I was in charge of an elementary education program at a small liberal arts college, each training program in the state used its own evaluation form. That was still the case. That is why the department developed a set of evaluation questions for all programs to use, as well as a standard form for reporting their ratings and comments.

To get a single set of standards used by licensure programs across the state for evaluating student teachers—for the students' sake—and to help department staff evaluate the effectiveness of the course work in the training program for purposes of program approval, department staff worked with teacher educators in the state in 2003 to develop a common set of evaluation questions for each generic professional standard. For example, for the standard "Plans lessons with clear objectives and relevant measurable outcomes," one evaluation question (with documentation to be provided by the student teacher) is "Are there suitable objectives for students who are academically advanced as well as for those whose work is at or below grade level?" For the standard "Employs appropriate sheltered English or subject matter strategies for English language learners," one evaluation question (with comments to be provided by a supervisor on an evaluation form) is "Does the candidate's speech model proper English usage when working with English language learners?" (see Appendix B for standards; all the evaluation questions can be found in the *Guidelines for Preservice Performance Assessment*, Massachusetts Department of Education, 2005c).

The state now has in place a uniform set of evaluation criteria, including license-specific criteria discussed below, for evaluating student

teachers. But whether program providers or reviewers will be able to learn much from this set of criteria depends on how they are used by the state or program supervisors. Instructors of prepracticum methods courses cannot easily find out about their students' weaknesses systematically (unless they are also their supervisors), nor can program reviewers find out systematically from supervising practitioners how effective the prepracticum course work was, say, in preparing elementary student teachers to teach reading or arithmetic unless each of a student teacher's supervisors makes independent, supported judgments (in response to the license-specific criteria) about the reading and arithmetic lessons observed and the comments are available to others for analysis. The information gap is only partially solved if the state requires two licensure tests of these prospective teachers, one of beginning reading instructional knowledge and the other of elementary mathematical knowledge; licensure tests do not provide clear information on how the student teacher has taught reading or arithmetic lessons.

LICENSE-SPECIFIC EVALUATION QUESTIONS

The third major component of the knowledge base a beginning teacher is expected to bring to his or her first classroom is a rudimentary set of license-specific pedagogical skills. To my way of thinking, these are far more important than most of the generic, or standard, pedagogical skills. A teacher should know what kind of thinking a discipline demands, what strategies are appropriate for teaching topics in that discipline, and what strategies might be counterproductive in fostering the kind of thinking required for more advanced work in that discipline (e.g., such as stressing inductive rather than deductive thinking in mathematics). A teacher must have a deep knowledge of the subject to refine these skills. These skills are unlikely to be learned in workshops that model a strategy (like the "workshop" model) as if it could apply to all disciplines, with teachers blithely asked afterward to work out ways to apply the strategy to their own discipline.

As crucially important as these skills are, we found no set of license-specific skills for any of the state's licenses forthcoming from any teacher training program in Massachusetts at the time we began to develop the guidelines for program approval.¹ So we developed a set of evaluation questions for each license to address the critical professional standard: "Demonstrates adequate knowledge of and approach to the academic content of lessons." This was not an easy task, we found. It took such a long time for teacher educators across the state to come up with a working set of license-specific skills for each license that I inferred that their student teachers had most likely never been evaluated consistently if at all for these kinds of skills. Indeed, many teacher educators expressed gratitude to the department for undertaking this initiative.

A tacit assumption underlying program approval within a state, never mind across states for the purpose of "reciprocity," is that those who complete approved programs for the same license meet the same minimum standards, regardless of the program they completed. The approving agency is rightfully expected to use the same criteria for evaluating all licensure programs for the same field across a state. If the programs leading to the same license in a state do not themselves use common license-specific questions and agreed-on forms of evidence to evaluate their student teachers (i.e., if the internal criteria and evidence these programs use are idiosyncratic to each program), on what basis can the approving agency judge these future teachers as meeting the same professional standards?

Appendix C contains a list of the questions in these two licensure programs that were agreed on for evaluating a student teacher's license-specific skills in history and mathematics practica. License-specific evaluation questions agreed on by teacher educators in other fields can be found on the department's Web site. Inquiries about how these license-specific questions are being used should be directed to the department's Office of Program Approval.

WHO IS RESPONSIBLE AND WHO IS ACCOUNTABLE?

For every subject except reading, the academic faculty in higher education institutions is clearly responsible for the subject matter knowledge teachers bring to their first classes. Yet the states and Title II of the Higher Education Act hold the pedagogical faculty accountable for results on subject matter tests. It is true that education schools may set their own admission standards (with approval from a university president and/or state board of regents, one assumes), but they have no direct control of either the quality and content of the arts and sciences courses prospective teachers take or the growing problem of grade inflation in these courses. The loudest cry today is that our teachers do not know the subject matter they are supposed to be teaching—in history, science, or mathematics. And indeed, the bulk of the money now being spent on professional development for teachers in these areas is for improving their knowledge of the subjects they teach. So one must wonder why the pedagogical faculty rather than the academic faculty at our institutions of higher education has consistently been held responsible for the academic content knowledge of our teaching force at the state and federal level.

The instrument that is now being used for holding the pedagogical faculty accountable—a subject matter test for teachers—is also not of their devising for the most part. The peer reviewers who advise on the design, weights, and cut score of a teacher test are by intention chiefly teachers holding the license for which the test is required. Pedagogical and academic faculty in that field must also be included, but volunteers from academic departments are not easy to obtain for these committees, I found, especially when they are in prestigious institutions of higher learning. As a result, the list of topics required for study for a license may not be grouped, tested, and weighted on a teacher test in ways it might be by an academic faculty focused on what secondary teachers of their dis-

cipline should know to teach the full range of students in their classes, including those who plan to go to demanding colleges. For example, one might expect difficult topics on a test of mathematics for Grades 8 to 12 to be weighted in a way to ensure that high school teachers can teach students capable of taking a course in calculus as well as students studying Algebra I. Yet test items for trigonometry, calculus, and discrete mathematics on the Massachusetts teacher test (grouped together in the most difficult section of the test) account for only 16% of the test score.² Because of compensatory scoring, a test taker could fail the entire section and still pass this licensure test.

In fact, most subject tests for licensing teachers are generally judged to be at a level that a good high school junior could pass (Education Trust, 1999), and many training programs across the country have begun using these subject tests as the rite de passage for doing student teaching. (For further reasons why teacher tests are not the whole answer to accountability for a teacher's subject matter knowledge, see Stotsky, 2004a.) Academic faculty tend to complain about the general quality of the freshmen they receive, but as a whole they have not chosen to involve themselves in the design and review of the licensure test for those who teach their discipline in public high schools. It is not surprising that the College Board, in an effort to meet the increasing demand for advanced placement courses in mathematics in public high schools, is providing an increasing amount of professional development for high school mathematics teachers. Not enough of them, apparently, can teach an advanced placement course in calculus, for example, even though calculus must have been a course they took as undergraduates.

As for the standards for professional knowledge and skills, they are the responsibility of the pedagogical faculty and the training program. Yet as noted, the evidence of their effectiveness comes chiefly from supervisors' evaluations based on each program's own criteria, without systematic feedback (in almost all states) to their programs from their graduates' performance as teacher of record and the academic performance of the children they teach. There is

also no systematic information on the credentials of those who supervise student teachers for training programs within or across states. Nor is there systematic information on the nature of their training programs to ensure that they know how to use an observation instrument for the student teachers they supervise. As is widely known, a very large number of field supervisors hold adjunct positions and are paid according to the number of student teachers they supervise.

License-specific pedagogical knowledge and skills for teachers of core subjects from Grades 5 to 12 are also the responsibility of pedagogical faculty, although one might logically expect them to be the responsibility of both the pedagogical and academic faculty in jointly designed courses that precede or accompany a jointly supervised practicum. But here, too, there is no systematic information available on how often prospective teachers of core subjects are observed by both the pedagogical and academic faculty. It may well not be the general rule across universities, given that academic faculty are not accountable for what prospective teachers of their own discipline learn before they become teachers of record in their own classrooms.

WHAT REFORMS MIGHT ADDRESS THESE PROBLEMS?

The root of the problem, philosopher Sidney Hook (1958) suggested, lies in the institutional separation, in the early part of the 20th century, of teacher training programs from the scholars in the discipline the prospective teacher teaches. In Hook's eyes, scholars abandoned the training of public school teachers and forsook grappling with the problems of "mass education in a democratic society." With the founding of schools of education, prospective teachers were henceforth to be isolated from the scholars in their subject area who should have been responsible for the level of academic knowledge they brought to their first jobs, and teacher educators were henceforth to be isolated from the scholars who should have been working with them on a regular basis to orient K-12 pedagogy and resolve K-12 curriculum questions in ways

appropriate for their disciplines and their particular modes of reasoning.

To make academic faculty accountable for the academic background that new teachers of their discipline from Grades 5 to 12 bring to their first teaching assignments, I propose transferring accountability from education schools or departments to the academic department that provides that academic background and at the graduate level. Before they can teach, prospective core subject teachers (in middle or high school) should be expected to complete a 1-year M.A.T. degree program in the discipline, or an M.S. or M.A. degree program in their discipline followed by an apprenticeship in the schools.³ M.A.T. programs, however small, exist at many universities today, especially the most prestigious ones, so that expectation is not beyond the imagination.

For this reform to work, undergraduate education courses could not be allowed or counted toward either an undergraduate or graduate degree program, a significant omission in recent efforts to reform teacher education.⁴ If entry into teaching Grades 5 to 12 required the completion of an M.A.T. program consisting of, say, four authentic graduate courses in the discipline and no more than one methods course followed by an apprenticeship in the schools that included seminars on what was taking place in the classroom, neither teacher tests nor departmental exit exams at the undergraduate level would be necessary.

Discipline-specific pedagogical faculty should also be attached to each department for supervision of student teaching and practicum seminars. The intellectual benefits for the pedagogical faculty in an academic department would be enormous (many of whom, ideally, should be former or part-time secondary school teachers of the subject). As members of the academic department, they would be expected to audit some of the graduate courses that future teachers of the discipline take to keep updated. They would work with their academic colleagues in designing pedagogical course work and supervising student teaching. Such an arrangement would be of benefit to the discipline as well. Discipline-specific pedagogical

faculty would report at the academic department's own faculty meetings on the teaching or learning problems in that discipline that they see in secondary school classrooms. Those responsible for the content of the discipline could then work with them directly on content-relevant ways to address the problems.

But, one might ask, where would "approval" take place? It would take place either through a university's internal procedures for approving or reviewing master's degree programs that are located in a graduate department in the arts and sciences or through a board of regents of higher education that may be involved in approving master's degree programs offered in arts and sciences graduate departments in a public university, or through the Teacher Education Accreditation Council. The formal recommendation for licensure to a state agency should come from the school in which the practicum took place. What would be needed are the signatures of a member of an academic department, a discipline-specific teacher educator in that department, and the teacher of the class in which the practicum took place. That would hold accountable the two institutions responsible for training the prospective core subject secondary teacher—the academic discipline and the school in which the pedagogical training took place. (For suggestions on how the training of prospective teachers of early childhood, elementary, and special education might be addressed, see Stotsky, 2005a.)

This restructuring of accountability for what a beginning teacher of a core subject needs to know straddles the two legal structures now available. In one, all a beginning core subject teacher needs to know is the content of an academic discipline. Most public charter schools and private schools can select as teachers those university graduates with the strongest academic credentials they can find. (For example, the Web site for the Winsor School in Boston, an elite private school for girls, shows all members of its science faculty holding Ph.D.s. Salary is clearly not the crucial factor here.) I know of no systematic data on the qualifications of teachers in public charter or private schools. But so far as can be determined from recent reports, public

charter schools have done as well as regular public schools with demographically similar populations, whereas a much higher percentage of Black and Hispanic students in Catholic schools reached a "proficient" level on the 2002 and 2003 Grade 8 reading tests given by the National Assessment of Education Progress than those in public schools. These results suggest that effective teachers may not necessarily have to have completed an approved program. Unfortunately, many would-be or practicing teachers with superb academic qualifications are limited to public charter or private schools and their low salaries because they have not completed (or will not complete) an approved program and, therefore, do not have a license to teach in the public schools.

In the traditional structure, even if an accelerated route has been used, beginning teachers of core subjects from Grades 5 to 12 are in theory supposed to have strong knowledge of an academic discipline. But they may not, chiefly because the wrong faculty is accountable for their level of academic competence if they are in a traditional licensure program, and the state and federal government now allows almost all of them to be licensed on the basis of a passing score on a typically undemanding subject matter test. Moreover, although all these teachers are also expected to begin teaching with a specific body of pedagogical knowledge, the state has made a regulatory arm of the state or an independent agency unaccountable to the public responsible for approving these teachers' training programs (accelerated or not) when there is no uniform or objective way to make judgments of their crucial details.

Administrators in public schools should be given back the opportunity they once had many decades ago to hire secondary core subject teachers with the kind of academic qualifications that many teachers in private schools have, without a requirement that these teachers undergo a cumbersome or lengthy credentialing process before or after they are hired. An M.A.T. M. A., or M. S. degree in the discipline and a student teaching experience are sufficient for licensure and

after successful teaching experience for 2 or 3 years, for tenure or long-term renewable contracts.

APPENDIX A
SUBJECT MATTER TOPICS REQUIRED
FOR STUDY IN TWO DIFFERENT FIELDS IN
THE MASSACHUSETTS REGULATIONS
FOR EDUCATOR LICENSURE AND
PREPARATION PROGRAM APPROVAL

History: The following topics are addressed on a test of subject matter knowledge:

- A. For the 1-6 level:
 1. United States history from the age of exploration to the Civil War.
 2. World history from human beginnings and ancient and classical civilizations of the Mediterranean area; and English and Western European history through the Enlightenment.
 3. Geography: major physical features of the world and key concepts of geography.
 4. Basic economic principles and concepts.
 5. United States political principles, institutions, and processes, their history and development.
 6. Major developments and figures in Massachusetts history.
- B. For the 5-8 and 8-12 levels:
 1. United States History: indigenous people of North America; European settlements and colonies; the American Revolution; expansion, reform, and economic growth of the United States up to the Civil War; the Civil War and Reconstruction; European immigration, industrialization, and scientific and technological progress; the two World Wars; and the United States from 1945 to the present.
 2. World History: human beginnings and early civilizations (Africa, Mesopotamia, Phoenicia, Egypt, India, China); roots of Western civilization (Israel, Greece, Rome); English and Western European history; Renaissance and the age of exploration; development of Asia, Africa, and South America; age of revolutionary change in Europe; the world in the era of two World Wars; and the world from 1945 to present.
 3. Geography.
 - a. Major physical features of the world.
 - b. Key concepts of geography and its effects on various peoples.
 4. Economics.
 - a. Fundamental economic concepts and economic reasoning.
 - b. American economic history.
 5. Government.

- a. Principles of American government and the Founding Documents of the United States.
- b. Comparative government.
6. History and Philosophy of Science.
7. Methods and Sources for Research in History.

Mathematics: The following topics are addressed on a test of subject matter knowledge.

- A. For the 1-6 level:
 1. Basic principles and concepts related to elementary school mathematics in the areas of number sense and numeration, patterns and functions, geometry and measurement, and data analysis.
 2. Algebra.
 3. Euclidean geometry.
- B. For the 5-8 level:
 1. Algebra.
 2. Euclidean geometry.
 3. Trigonometry.
 4. Discrete/finite mathematics.
 5. Introductory calculus through integration.
 6. History of mathematics.
- C. For the 8-12 level: The topics set forth for the 5-8 level plus:
 1. Abstract algebra.
 2. Number theory.
 3. Calculus through differential equations.
 4. Probability and statistics.
 5. Non-Euclidean and transformational geometries.
 6. Applied mathematics or mathematics modeling.

SOURCE: Massachusetts Department of Education (2005a).

**APPENDIX B
PROFESSIONAL STANDARDS FOR
TEACHERS IN THE MASSACHUSETTS
REGULATIONS FOR EDUCATOR
LICENSURE AND PREPARATION
PROGRAM APPROVAL**

I. Plans Curriculum and Instruction

1. Draws on content standards of the relevant curriculum frameworks to plan sequential units of study, individual lessons, and learning activities that make learning cumulative and advance students' level of content knowledge.
2. Draws on results of formal and informal assessments as well as knowledge of human development to identify teaching strategies and learning activities appropriate to the specific discipline, age, level of English language proficiency, and range of cognitive levels being taught.
3. Identifies appropriate reading materials, other resources, and writing activities for promoting further learning by the full range of students within the classroom.

4. Identifies prerequisite skills, concepts, and vocabulary needed for the learning activities.
5. Plans lessons with clear objectives and relevant measurable outcomes.
6. Draws on resources from colleagues, families, and the community to enhance learning.
7. Incorporates appropriate technology and media in lesson planning.
8. Uses information in Individualized Education Programs (IEPs) to plan strategies for integrating students with disabilities into general education classrooms.

II. Delivers Effective Instruction

1. Makes learning objectives clear to the student.
2. Communicates clearly in writing and speaking.
3. Uses engaging ways to begin a new unit of study or lesson.
4. Builds on students' prior knowledge and experience.
5. Uses a balanced approach to teaching skills and concepts of elementary reading and writing.
6. Employs a variety of content-based and content-oriented teaching techniques, from more teacher-directed strategies such as direct instruction, practice, and Socratic dialogue, to less teacher-directed approaches such as discussion, problem solving, cooperative learning, and research projects (among others).
7. Demonstrates adequate knowledge of and approach to the academic content of lessons.
8. Employs a variety of reading and writing strategies for addressing the learning objectives.
9. Employs appropriate sheltered English or subject matter strategies for English language learners.
10. Uses questioning to stimulate thinking and encourages all students to respond.
11. Uses instructional technology appropriately.
12. Assigns homework or practice that furthers student learning and checks it.
13. Provides regular and frequent feedback to students on their progress.
14. Provides many and varied opportunities for students to achieve competence.
15. Accurately measures student achievement of, and progress toward, the learning objectives with a variety of formal and informal assessments, and uses results to plan further instruction.
16. Translates evaluations of student work into records that accurately convey the level of achievement students for parents or guardians, and school personnel.

III. Manages Classroom Climate and Operation

1. Creates an environment that is conducive to learning.

2. Creates a physical environment appropriate to range of learning activities.
3. Maintains appropriate standards of behavior, mutual respect, and safety.
4. Manages classroom routines and procedures without loss of significant instructional time.

IV. Promotes Equity

1. Encourages all students to believe that effort is a key to achievement.
2. Works to promote achievement by all students without exception.
3. Assesses the significance of student differences in home experiences, background knowledge, learning skills, learning pace, and proficiency in the English language for learning the curriculum at hand and uses professional judgment to determine if instructional adjustments are necessary.
4. Helps all students to understand American civic culture, its underlying ideals, founding political principles, and political institutions and to see themselves as members of a local, state, national, and international civic community.

V. Meets Professional Responsibilities

1. Understands his or her legal and moral responsibilities.
2. Conveys knowledge of and enthusiasm for his/her academic discipline to students.
3. Maintains interest in current theory, research, and developments in the academic discipline and exercises judgment in accepting implications or findings as valid for application in classroom practice.
4. Collaborates with colleagues to improve instruction, assessment, and student achievement.
5. Works actively to involve parents in their child's academic activities and performance, and communicates clearly with them.
6. Reflects critically upon his or her teaching experience, identifies areas for further professional development as part of a professional development plan that is linked to grade level, school, and district goals, and is receptive to suggestions for growth.
7. Understands legal and ethical issues as they apply to responsible and acceptable use of the Internet and other resources.

SOURCE: Massachusetts Department of Education (2005b).

APPENDIX C LICENSE-SPECIFIC EVALUATION QUESTIONS IN TWO FIELDS, FROM MASSACHUSETTS DEPARTMENT OF EDUCATION GUIDELINES

For History

1. Does the candidate demonstrate an adequate knowledge of the historical period, event, or individual under discussion when conducting a history lesson? Does he or she place the period, event, or individual in an appropriate historical context? Does he or she use maps or globes when relevant to the topic?
2. Does the candidate explain how the individual, period, or event under discussion is related to the development of our political principles or institutions, when relevant?
3. Does the candidate avoid presentism, that is, making moral judgments about past events, behaviors, or decisions that reflect contemporary moral views, not those of the time of the event, behavior, or decision?
4. Does the candidate avoid presenting his or her own views on social or political issues as the correct ones and inhibiting a full range of student views? Does the candidate encourage students to offer views that may conflict with the candidate's views?
5. Does the candidate relate the topic of the lesson to a local, national, or international event or situation when relevant?
6. Does the candidate use or refer to historically contemporary primary sources in addition to the textbook in the course of the lesson?
7. Does the candidate refer to appropriate concepts and skills as well as standards from the History and Social Science Curriculum Framework in developing a lesson?
8. Does the candidate refer regularly to maps and globes when conducting geography lessons?
9. Does the candidate address theories and practices in economics and government appropriately into history lessons?
10. Does he or she adequately address causes and consequences of events?

For Mathematics

1. Does the candidate appropriately balance activities for developing conceptual and procedural knowledge of mathematics?
2. Does the candidate use multiple representations of concepts such as numerals or diagrams, algebraic expressions or graphics, or matrices that model a method for solving a system of equations?
3. Are manipulatives and concrete representations used when appropriate?
4. Does the candidate help students to learn alternate methods of solving mathematics problems?
5. Are students' mathematical misconceptions identified and addressed?
6. Does the candidate model clear mathematical reasoning when helping students solve mathematics problems?

7. Does the candidate know how to teach the standard algorithms for arithmetical operations and teach them to students?
8. Does the candidate refer to the appropriate level of the state's mathematics standards to prepare a lesson?
9. Is the candidate's explanation of mathematical concepts accurate?
10. Does the candidate expect students to use accurate mathematical language to talk and write about mathematics?

SOURCE: Massachusetts Department of Education (2005c).

NOTES

1. The introduction indicates that the professional standards for teachers should be used by all licensure programs for the initial license. Program providers may add additional standards if they deem them relevant to the license but not substitute them for those in the common list.

2. An outline of the test objectives for each teacher test and the weight for each section are available through a link on the Massachusetts Department of Education Web site (www.doe.mass.edu).

3. Expecting teachers of secondary school subjects to have a master's degree of some kind in the subject they teach would not be too high an expectation. According to an employee of the Spanish government at the Massachusetts Department of Education in 2003, most middle and high school teachers in Spain are expected to have the equivalent of a master's degree in their discipline before they take a 1-year course in pedagogy that will make them eligible to take a competitive examination for teaching in the Spanish public schools. This series of requirements, he told me, is not uncommon in other European countries.

There are several reasons for promoting M.A.T. programs attached to their academic disciplines as the professional training program for teachers of core subjects in Grades 5 to 12. First, they are designed, like programs in law or medicine, to include academic course work as part of the training program; at least half the courses are supposed to be in the arts and sciences in the subject the student plans to teach. For liberal arts graduates who majored in a subject not usually taught in the public schools (e.g., sociology, anthropology, or religion) and then decided to seek a teaching career, the requirement that half the course work for an M.A.T. program be in the field of the license sought would address content deficiencies. This is one of the major strengths of the M.A.T. program. Samuel Wineburg (2005), a professor of history education at Stanford University, noted in an op-ed in the *Los Angeles Times* that almost one third of the students applying to Stanford's M.A.T. program to become history teachers have never taken one single college course in history.

Second, those who complete these programs start teaching with the salary for those with a master's degree. They can devote the first 3 years of teaching wholly to teaching, not in part to weekend education courses to get a master's degree.

Third, these programs attract able liberal arts graduates (such as those now attracted to Teach for America) because they are academically prestigious and require few education courses—and in my judgment, the fewer the better. Pedagogical training should take place almost wholly in student teaching.

Critics of the proposition that all prospective teachers of core subjects from Grades 5 to 12 should be required to complete some kind of master's degree program as part of their professional training question whether authentic graduate course work is needed in all fields. I would argue that it is, but for different reasons in each major subject. It is needed in general because of the variation in the academic rigor of undergraduate courses today,

including those in the upper level. Grade inflation has made a B.A. degree of uncertain value, especially in those institutions that produce the bulk of our teaching force. All secondary English and history teachers should be capable of "arguing" about what is in that teach advanced placement courses in their disciplines.

Attaching prospective English teachers to an English department at the graduate level and making that department accountable for preparing them would not only ensure that they take a few substantive English courses but also require some of their professors to learn why freshmen and sophomores taking undergraduate English courses are incapable of "arguing" about what is in a literary text today (see my review of a recent book by Gerald Graff, his response, and my counterresponse in Stotsky, 2005b). The public schools might then get English teachers who understand why students have to be taught how to read what the author wrote and how to do so before asking them to respond to or interpret the work.

Attaching prospective history and U.S. government teachers to their academic disciplines for a graduate degree program and making those departments accountable for preparing them might compel those departments to ensure appropriate course work on constitutional history and U.S. government if the schools were responsible for recommending student teachers for licensure. As I noted in Stotsky (2004b), currently licensed middle grade teachers of history may know almost nothing about our political principles and institutions (to judge from applications to the U.S. Department of Education for Teaching American History grants) because their undergraduate programs did not require much if any study in these areas. It would be easier to move Mount Everest than to get a board of regents or board of higher education to intervene in what an academic department judges is the appropriate content for its major, even for a prospective teacher of K-12.

As for prospective teachers of mathematics and science for Grades 5 to 12, a graduate-level professional training program that required well-chosen course work in the discipline would, in my view, solve the current problem of licensed high school teachers of mathematics and science who must be given professional development to teach the increasing number of advanced placement courses that are being offered in or proposed for the high school. Would they be relevant? In molecular biology, absolutely. And in mathematics, some universities (e.g., Clark-Atlanta University) are already piloting an M.A. degree program in mathematics for secondary mathematics teachers that is in addition to the traditional M.S. degree program in mathematics.

4. Allowing credits from undergraduate education courses to count for the master's degree turned out to be one of the deadly flaws in the 5-year training programs developed after the release of the Holmes Group (1986) report *Tomorrow's Teachers*. The recommendation had been for a 4-year undergraduate liberal arts program followed by a master's degree program in education. An account of the evolution of the Holmes Group and how its recommendation got implemented at one university can be found in Scrupski (1999).

REFERENCES

- Education Reform Act of 1993, Chap. 71, Statutes of the Commonwealth of Massachusetts.
- Education Trust. (1999, Summer). *Not good enough: A content analysis of teacher licensing exams*. Washington, DC: Author.
- Goldhaber, D. (2004). Why do we license teachers? In F. Hess, A. Rotherham, & K. Walsh (Eds.), *A qualified teacher in every classroom? Appraising old answers and new ideas* (pp. 81-100). Cambridge, MA: Harvard Education Press.
- Holmes Group. (1986). *Tomorrow's teachers*. East Lansing, MI: Author.

- Hook, S. (1958). Modern education and its critics. In I. Scheffler (Ed.), *Modern reading: Philosophy and education* (pp. 272-291). Boston: Allyn & Bacon.
- Ingersoll, R. (2004). Why some schools have more under-qualified teachers than others. In D. Ravitch (Ed.), *Brookings papers on education policy, 2004* (pp. 45-78). Washington, DC: Brookings Institution.
- Massachusetts Department of Education. (2005a). *Massachusetts regulations for educator licensure and preparation program approval* (603 CMR 7.06). Retrieved from <http://www.doe.mass.edu/lawsregs/603cmr7.html?section=06>
- Massachusetts Department of Education. (2005b). *Massachusetts regulations for educator licensure and preparation program approval* (603 CMR 7.08). Retrieved from <http://www.doe.mass.edu/lawsregs/603cmr7.html?section=08>
- Massachusetts Department of Education. (2005c, Spring). *Guidelines for preservice performance assessment*. Retrieved from http://www.doe.mass.edu/edprep/ppa_guidelines.pdf
- Podgursky, M. (2004). Model 4: Improving academic performance in U.S. public schools: Why teacher licensing is (almost) irrelevant. In F. Hess, A. Rotherham, & K. Walsh (Eds.), *A qualified teacher in every classroom? Appraising old answers and new ideas* (pp. 255-278). Cambridge, MA: Harvard Education Press.
- Sapon-Shevin, M. (1999, Winter). New equity policy passes—The hard work begins. *Teaching and Teacher Education* (Division K Newsletter), 3ff.
- Scrupski, A. (1999). Change in teacher education: How Holmes was hijacked. *Academic Questions*, 12(3), 36-49.
- Stotsky, S. (2004a). Can a state department of education increase teacher quality? Lessons learned in Massachusetts. In D. Ravitch (Ed.), *Brookings papers on education policy, 2004* (pp. 131-180). Washington, DC: Brookings Institution.
- Stotsky, S. (2004b). When history teachers forget the founding. *Academic Questions*, 17(3), 21-31.
- Stotsky, S. (2005a). It's academic: Teacher training in core subjects needs firm grounding in liberal arts. *Commonwealth*, 10(3), 21-26. Retrieved from <http://www.massinc.org/handler.cfm?type=1&target=2005-3/perspective.htm>
- Stotsky, S. (2005b). Review of *Clueless in academe: How schooling obscures the life of the mind* by Gerald Graff: Response by Gerald Graff and counter-response by Sandra Stotsky. *American Journal of Education*, 112(1), 21-26.
- Wineburg, S. (2005, February 24). Commentary: A history of flawed teaching. *Los Angeles Times*. Retrieved from <http://www.latimes.com/news/printedition/opinion/la-oe-wineburg24feb24,1,5937687.story>

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