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Teachers' Education and Outcomes: Mapping the Research Terrain

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Background/Context: *Questions about teacher quality, including how teachers ought to be educated and licensed, rank near the top of the educational agenda in the United States. These controversies persist because of lack of consensus about what "teacher quality" means, conflicting claims about the empirical evidence, and public skepticism about the need for*

formal teacher preparation. Because there has been relatively little research on the outcomes of preparation programs and pathways and because researchers work from diverging paradigms, there are few clear conclusions in this area.

Purpose/Objective/Research Question/Focus of Study: *The purpose of this article is to offer a conceptual analysis of empirical research on teachers' education and outcomes that is linked to the political controversies and policy debates that shape it. Using the concept of research "genres," the article addresses two questions: (1) How have researchers conceptualized and studied the connections between teachers' education and its outcomes, consequences, or results? (2) What are the policy controversies and larger social and political factors that have shaped these genres?*

Research Design: *This review focuses on research conducted in the United States since 1998 and published by peer-reviewed journals or centers with peer review procedures. The review includes only empirical research that explicitly examines connections between particular aspects of teachers' education (e.g., certification status, academic background, pathways into teaching, program mission/curriculum, transitions to teaching, life experiences) and specific posteducation outcomes (e.g., teacher preparedness, beliefs, practice, retention, student achievement).*

Findings/Results: *The review reveals that there are six distinguishable genres that examine connections between teachers' education and posteducation outcomes: teacher certification and its correlates, teachers' educational backgrounds and the teacher workforce, entry pathways into teaching and their consequences, teacher preparation programs and their graduates, teacher preparation and learning to teach in the early career years, and teachers' life experiences and beliefs/practices. The article analyzes and critiques each genre, including its contributions/limitations and the controversies it addresses.*

Conclusions/Recommendations: *The review concludes that there continue to be relatively few studies that connect aspects of teachers' education to outcomes; some genres focus primarily on outcomes related to student achievement, whereas others focus primarily on outcomes related to teacher learning. These genres have grown up relatively separately from one another. The review recommends that all six research genres ought to be taken into account by policymakers, researchers, and practitioners in order to have a rich understandings of teachers' education and outcomes.*

Over the last two decades, questions about teacher quality, including how teachers ought to be educated and licensed, have ranked near the top of the educational agenda in the United States and elsewhere. There are enormous controversies about these issues, however, due in part to the shifting political landscape and to conflicting claims about what the empirical evidence says.

With this complex landscape as the backdrop, the purpose of this article is twofold: to offer a conceptual analysis of empirical research that examines the connection between teachers' education and its outcomes, consequences, or results; and to link this research to the political controversies and the local and larger policy debates that have shaped it. Using

"teachers' education and outcomes" as an all-purpose term, which is elaborated below, the article sorts into six genres the multiple ways researchers from different disciplines and with different intentions have conceptualized and studied relationships between teachers' education and outcomes. We suggest that these different genres are implicated in different ways in key policy and political discourses about teacher quality, some of which have gained prominence over the last decade whereas others have been marginalized. The research genres most closely aligned with the logic and issues of dominant political discourses regarding teacher quality are most attended to by policymakers and politicians. This means that understanding the research about teachers' education and outcomes is not simply a matter of assessing its methodological and conceptual merits, but also of interpreting larger political controversies and competing policy agendas.

CONTROVERSIES ABOUT TEACHER QUALITY AND TEACHER EDUCATION

In many countries, improving teacher quality is now assumed to be a central strategy for improving a nation's ability to compete in the global knowledge economy, ensuring the quality of the workforce, and meeting rising social expectations related to diversity and equality (e.g., Darling-Hammond, 2010; Furlong, Cochran-Smith, & Brennan, 2009; McKinsey & Company, 2009; Organization for Economic Cooperation and Development, 2005). There is no consensus, however, about what "teacher quality" actually means, how exactly it matters, or how it should be assessed. There is debate about whether and how teacher quality depends on particular teacher preparation programs, pathways, or recruitment and retention strategies, and about whether and how quality is enhanced or diminished by other factors, such as teachers' characteristics, licensing and credentialing regulations, the cultures and conditions of schools, and broader policy and accountability contexts.

Among the most controversial issues related to teacher quality are those that have to do with how and by whom teachers ought to be selected, educated, and licensed. These controversies are partly the result of the shift to a global knowledge economy, which changed the locus of education policymaking in the United States from lower-profile state agencies and local-level decisions to the highest levels of government, business, and philanthropy (Oakes, Lipton, Rogers & Renee, 2006). In short, as teachers came to be regarded as the linchpins of educational success, teachers' education and licensure became high-stakes problems to be solved at the highest policy levels. In addition, issues regarding

teachers' education are embedded within highly politicized debates about the impact of school versus out-of-school factors on achievement and equity (e.g., Economic Policy Institute, 2008, 2009; Education Equality Project, 2008, 2009) and about who deserves blame or praise for the current state of the schools (Cochran-Smith & Fries, 2010). All of this is part of what DeBray-Pelot and McGuinn (2009) have called the "new politics" of post-No Child Left Behind (NCLB) education policy, which involves not only an expanded federal role, but also unprecedented political coalitions and ruptures (Apple, 2005; Spring, 2010).

Another reason there are so many controversies about teachers' education has to do with the fact that research on this topic has been wielded as a kind of weapon (Cochran-Smith, 2002) in highly contentious policy debates for more than a decade. In addition, although there has been a great deal of research during the last 25 years about knowledge for teaching and how teachers learn, there have been many fewer studies about the outcomes of teacher preparation programs and pathways (Cochran-Smith & Zeichner, 2005; Wilson, Floden, & Ferrini-Mundy, 2001). Further, there is no consensus about the research approaches best suited to address these issues. Researchers who address different questions tend not to work in the same fields, and their research may not be well known to, or valued by, those who work in other fields. In addition, even when researchers address the same sorts of questions, there are often methodological or political differences that lead to disagreements about what the evidence actually means and what its implications are for policy and practice.

Finally, and perhaps most importantly, current controversies regarding how teachers ought to be educated and licensed stem from acute public skepticism about whether teacher preparation is really necessary at all, given the lack of clear evidence that preparation programs have direct positive effects on students' achievement (Cochran-Smith & Zeichner, 2005; Wilson et al., 2001); the enduring sentiment that good teachers are born, not made; and the proliferation of so-called "alternate" forms of preparation. Because there has been relatively little research on the outcomes of programs or pathways and because researchers work out of diverging paradigms when they do address these issues, there are few clear or well-known conclusions in this area.

CONCEPTUAL FRAMEWORK

Although researchers have examined the connections between teachers' education and outcomes in various ways, multiple research approaches are seldom combined in the same review or even in the same discussion.

In contrast, this review attempts to map the full research terrain on the topic.

Figure 1. Teachers' education and outcomes: a conceptual framework for mapping the research terrain
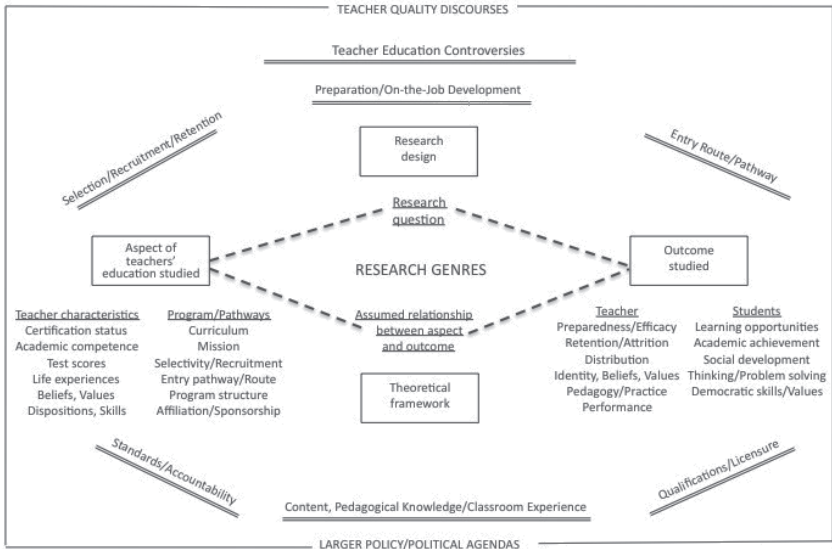

Figure 1 represents the multilayered conceptual framework that guided this analysis. At the center of the framework are the two core building blocks of each of the genres of research on teachers' education and outcomes, which we identified in this review: (1) empirical examination of one or more aspects of teachers' education, in relationship to (2) one or more outcomes, consequences, or results. As Figure 1 shows, the aspects of teachers' education examined are usually either teacher characteristics or program/pathway characteristics, whereas the outcomes examined are defined in terms of either teachers or students. Various genres pose different questions about the connections between education and outcomes based on differing assumed relationships between the two, and in keeping with a larger theoretical framework. Research designs vary according to the procedures and analytic tools used to investigate specific questions about the relationships between teachers' education and outcomes.

We locate these genres of research within the context of key controversies in the political and policy context. Represented on Figure 1 by double underlining, these controversies include who should be recruited into teaching and what degree of selectivity should be enforced; how

teachers should be retained; how much and what kind of preparation and/or on-the-job development teachers should have and where, how, and by whom these should be provided; what qualifications teachers should have and what regulations should be in place regarding program approval, certification, and licensure; what standards should govern teacher preparation, including the outcomes for which programs and pathways should be held accountable; what knowledge and classroom experiences teachers should have prior to teaching; and what entry routes/pathways into teaching should be permitted (Cochran-Smith, Feiman-Nemser, McIntyre, & Demers, 2008; Committee on the Study of Teacher Preparation Programs in the United States, 2010; Earley, Imig, & Michelli, 2011).

The outermost layer of the conceptual framework is depicted by the frame that encloses Figure 1. This represents major state, federal, and professional discourses regarding teacher quality and teacher preparation as well as the larger policy and political agendas to which these are often attached in the contemporary context. In the mid-to-late 1990s and early 2000s, two competing political agendas shaped many discussions about teacher education reform—a professionalization agenda and a deregulation agenda (Cochran-Smith & Fries, 2001, 2005; Zeichner, 2003). As part of post-NCLB politics, however, debates about teacher education have been intertwined with larger discourses about teacher quality. Although debates about professionalization and deregulation continue, the larger discourse is now more complex. In our analysis of the genres of research that examine connections between teachers' education and outcomes, we used Cochran-Smith and Fries' (2010, 2011) five contemporary discourses regarding teacher education and teacher quality, which they label the teacher quality gap and educational inequality, teacher quality and the market, teacher quality and the knowledge economy, teacher quality and professional teacher education, and teacher quality and social justice. It is not within the scope of this article to elaborate each of these discourses, but it is important to point out, as Cochran-Smith and Fries do, that although these discourses reflect contrasting values and ideologies, they also sometimes allow politically expedient alliances.

STAKING OUT THE RESEARCH TERRAIN

Working from the framework described above, this article addresses two sets of questions: (1) How have researchers conceptualized and studied the connections between teachers' education and its outcomes, consequences, or results? What are the contributions and limitations of the

various approaches? (2) What are the controversies and larger social and political factors that have shaped these genres of research? How is the research used in contemporary discourses related to teacher quality and teacher education reform?

REVIEW PROCEDURES

Our general goal was to provide a conceptual analysis of all the recent empirical research across disciplines and approaches that connects (1) one or more aspects of teachers' education or licensure with (2) one or more aspects of the postpreparation consequences, outcomes, developments, and/or effects of these.[1] We included in this review only those studies that connected the dots between (1) and (2) in some explicit way. Thus, for example, we excluded studies of teachers' preparation, even when labeled "longitudinal," if they did not follow teacher candidates beyond the preparation period. Likewise, we excluded studies of teacher retention and attrition if they did not account for teachers' initial education and/or certification status in some way. This in no way suggests that these studies were not important, but that they did not meet our intention of reviewing studies that make the connection between teachers' education and outcomes. We found that studies conceptualized (1) in terms of teacher selection and recruitment, pathways into teaching, teacher preparation program structures, teacher preparation curricula and/or missions, teacher certification status, teacher certification requirements including testing, teachers' general educational background, teachers' coursework and fieldwork, and teachers' experiential backgrounds. We found that studies conceptualized (2) in terms of teachers' knowledge and skills, pedagogy and teaching practice, values and beliefs, performance, sense of identity, sense of efficacy or preparedness, efforts to teach for democratic participation or social justice, where teachers chose to or were assigned to teach, teacher retention/attrition/migration, career trajectories, students' learning opportunities, student performance, student test scores, and other student or school outcomes. We did not deliberately include or exclude *a priori* any particular aspects of teachers' education or outcomes because our intention here was not to take a position about which outcomes are more inclusive or more important than others. Rather, we wanted to map the field of research as it exists currently. Thus we identified aspects of teachers' education and outcomes inductively by searching as broadly as possible within the parameters described above and in terms of the controversies and debates that are part of the conceptual framework.

Only studies focusing on the U.S. context and published by peer-

reviewed journals or policy and research centers with established peer-review procedures were included. The year 1998 was used as a beginning time point for the review in keeping with the argument that the reauthorization of the Higher Education Act (HEA) in that year was a rough marker for the emergence of a "new teacher education" in the United States, which was defined as a public policy problem and focused on evidence and outcomes (Cochran-Smith, 2005). Studies that connected (1) and (2), as above, were located through electronic searches of four major databases (ERIC, PsychINFO, Sociological Abstracts, and EconLit), supplemented with hand searches of selected peer-reviewed journals.[2] Additionally, we reviewed the publications of major education policy or research organizations that met criteria comparable to peer review. This analysis is based on roughly 120 studies that met the criteria.[3]

RESEARCH GENRES

We used the concept of research "genres," as other researchers (Borko, Whitcomb, & Byrnes, 2008; Kennedy, 1991, 1996) have done, to map the research terrain. Kennedy (1991), for example, described genres of research on the effectiveness of preservice teacher education as "distinct categories" with a "coherent and internally consistent way of thinking about whether teacher education makes a difference" (p. 120). Kennedy (1995) suggested that empirical research within each genre tended to build on other work within that same genre, thus reflecting the shared norms of specific scholarly communities as well as shared interests in particular aspects of teacher education.

Although our concept of "genre" is similar to Kennedy's, our identification of genres is based on review of a systematically constructed body of research investigating teachers' education and outcomes and an iterative process of classification of studies. This process allowed us to distinguish six genres of research that connect teachers' education and outcomes, which we labeled as follows:

- Genre 1: Teacher certification status and its correlates

- Genre 2: Teachers' educational backgrounds and the teacher workforce

- Genre 3: Entry pathways into teaching and their consequences

- Genre 4: Teacher preparation programs and their graduates

Figure 2. Six genres and their features

	Aspects of Teachers' Education Studied	Outcome Studied	Assumed Relationship between Teachers' Education and Outcomes	Discipline(s)/ Theoretical Framework(s)	Research Method(s)	Audience(s)
GENRE 1: Teacher Certification Status and Its Correlates	Teacher certification status	Pupil test scores; distribution of teachers	If effective, certification policy can redistribute quality teachers and/or increase student achievement.	Social science, especially economics and sociology/ variance theory	Complex statistical models, including hierarchical linear modeling (HLM) and value added modeling	State and national policymakers who control requirements for certification and/or accreditation
GENRE 2: Teachers' Educational Backgrounds and the Teacher Workforce	Teachers' academic competence	Pupil test scores; distribution of teachers; preparedness	If effective, policies regarding subject-matter and/or academic background can improve practice and/or increase student achievement.	Social science, especially economics and sociology/ variance theory	Complex statistical models, including HLM and hierarchical generalized linear modeling	State and national policymakers who control requirements for certification and/or accreditation, especially academic knowledge
GENRE 3: Entry Pathways into Teaching and Their Consequences	Entry pathways into teaching or program structures	Preparedness; career trajectories; pupil test scores; pedagogy and practice; beliefs; distribution of teachers	If effective, policies regarding entry pathway/program structures can increase retention, improve practice, and/or increase student achievement.	Social science, especially economics and sociology/ variance theory	Complex statistical models, including general linear modeling; mixed methods	Local, state, and national policymakers who control entry requirements and/or establish program structures
GENRE 4: Teacher Preparation Programs and Their Graduates	Curriculum or mission of particular preparation programs/ pathways	Pedagogy and practice; career trajectories; beliefs; preparedness; distribution of teachers	If effective, professional teacher education can improve practice and increase preparedness and/or retention.	Curriculum and instruction/ constructivist, sociocultural theories, including developmental and social justice theory	Case studies; observations and interviews; surveys; evaluation studies	Teacher education practitioners and researchers; local, state, and national policymakers
GENRE 5: Transition from Preparation or Preteaching into Teaching	Beliefs and experiences of graduates from traditional and alternative teacher education programs	Pedagogy and practice; preparedness; career trajectories	If effective, professional teacher education can improve practice and/or increase retention.	Curriculum and instruction/ constructivist, sociocultural theories, including activity theory and cultural-historical activity theory	Single- and cross-case studies; observations and interviews; surveys	Teacher education practitioners and researchers; local, state, and national policymakers, especially professional accreditors
GENRE 6: Teachers' Life Histories and Their Beliefs and Practices	Life histories or teachers' experiential backgrounds	Beliefs; pedagogy and practice	Understanding teachers' life histories can help preparation programs better support candidates from diverse backgrounds.	Curriculum and instruction and sociology/ sociocultural theories, including identity theory	Single- and cross-case studies; self-studies;	Teacher education practitioners and researchers, and local policymakers

- Genre 5: Teacher preparation and learning to teach in the early career years

- Genre 6: Teachers' life histories and their subsequent beliefs and practices

As Figure 2 indicates,[4] each genre is conceptually and methodologically coherent. Studies in each genre identify and examine similar aspects of teachers' education and/or licensure; identify and examine similar outcomes or results of teachers' education; conceptualize the relationship between teachers' education and outcomes in a similar way, using the same logic and assumptions; work from the same or similar disciplines and draw on theoretical concepts and frameworks that are the same or consistent with one another; utilize similar research designs as well as specific methods of data collection and analysis; and have the same larger purposes and audiences.

TEACHERS' EDUCATION AND OUTCOMES: A CRITICAL CONCEPTUAL REVIEW OF SIX GENRES

In the following sections we analyze each of the genres, discuss its role in major contemporary controversies about teacher education, and consider how each genre is related to larger policy and political discourses about teacher quality.

GENRE 1: TEACHER CERTIFICATION STATUS AND ITS CORRELATES

We label Genre 1 "teacher certification status and its correlates" to signal both the substantive focus of the genre and its search for variables, such as student achievement or teaching location, that are correlated with certification. Studies in this genre have been used as evidence in contentious public controversies about the entire regulatory apparatus of teacher preparation and licensure since the late 1990s when scholars, often heavily invested in either the professionalization agenda or the deregulation agenda, debated the design, findings, and implications of research in this genre for policy and practice. More recently, studies in this genre have been deployed in arguments regarding the "teacher quality gap" (Cochran-Smith & Fries, 2010)—that is, the inequitable distribution of talented and well-qualified teachers to more and less well-resourced schools and districts, which exacerbates the achievement gap.

The use of this research in debates about teacher quality reflects unresolved questions about whether certification is an essential ingredient in

teacher quality or a barrier to it. Some argue that the teacher quality gap can be closed through the expansion of alternate routes into teaching and revised hiring and teacher assignment policies (e.g., Education Trust, 2008; National Comprehensive Center for Teacher Quality, 2009; Peske, Crawford, & Pick, 2006; Peske & Haycock, 2006). Others aim to close the teacher quality gap by guaranteeing that all teachers are fully prepared and fully certified prior to classroom teaching (e.g., Berry, 2010; Darling-Hammond, 2007). These diametrically opposed solutions to the problem of the teacher quality gap are based on different definitions of teacher quality, different methodological decisions about how to classify teachers who hold various types of certification, different interpretations of the empirical evidence that gets at these issues, and different larger agendas regarding the reform of public education.

Aspects of teachers' education and outcomes that are examined

The studies in this genre are conducted by economists, public policy researchers, sociologists, and other social scientists with the intention of generating empirical evidence to inform or sway federal and state policies regarding the certification and licensure of teachers. Many of these studies were designed specifically to ascertain whether teacher certification policies ensure teacher quality and teacher effectiveness, defined primarily in terms of gains in students' scores on tests. Studies in this genre ask questions such as: "Is teacher certification associated with higher initial reading achievement in kindergarten?" (Easton-Brooks & Davis, 2009), "What is the relative size of the effect of teachers' background qualifications (including certification) on student achievement in first grade?" (Palardy & Rumberger, 2008), and "What is the effect on student gains in mathematics and science of having a teacher who is certified in secondary mathematics or science versus a teacher certified in elementary education or not certified?" (Neild, Farley-Ripple, & Byrnes, 2009). Here the intention is to determine empirically whether managing the teacher labor market by requiring state teaching certification is an effective quality control mechanism. A basic premise of many of the studies in this genre is that certification is a barrier to individuals who desire to enter teaching. From this perspective, the assumption is that any state-level policies requiring teachers to be certified should be justified with substantial support from empirical evidence (e.g., Mosteller & Boruch, 2001). The empirical research regarding the impact of certification is also entangled in highly politicized debates about allowable routes into teaching.

In contrast to studies like the three cited above, a subgroup of studies

in this genre begins with the assumption, usually not stated explicitly, that teacher certification is a legitimate proxy for teacher quality. Working from this assumption, some studies examine how teacher certification status is distributed across schools, school levels and districts, or subject areas. Here, studies ask questions such as, "What is the current distribution of emergency permit teachers in the state?" (Goe, 2002) and "How much variation is there in the quality attributes of teachers (including certification status) across schools?" (Lankford, Loeb, & Wyckoff, 2002). The explicit focus is on unequal teacher distribution and how this relates to unequal student achievement among socioeconomic, racial, or language groups and across schools.

Theoretical frameworks and research designs

Although many of the studies in Genre 1 are not explicit about their guiding theoretical frameworks, those that are usually frame the issue of certification as part of larger understandings about the nature of the teacher workforce and the pros and cons of various policies and regulations related to productivity, quality, and professionalism. For example, Goldhaber (2007) frames teacher testing as an occupational screening device with specific trade-offs. Laczko-Kerr and Berliner (2002) discuss certification controversies as a struggle between popular versus professional control of teacher supply. Lastly, Angrist and Guryan (2008) consider occupational licensing in terms of the impact of worker screening mechanisms on productivity and quality.

The studies in this genre share key assumptions about the role of social science research in policymaking, particularly the idea that getting the right policies into place regarding certification and licensure will solve problems related to both teacher shortages and teacher quality. The disagreements that arise among researchers whose studies fit into this genre often stem from divergent interpretations of findings and their implications regarding the policies that should govern teacher certification. Crowe (2008) has suggested that this lack of agreement hinders the development of teacher education as a profession.

All of the studies in Genre 1 (and many of those in Genres 2 and 3) utilize complex statistical methodologies, seeking to identify either the effects of teacher certification policies in terms of measurable and consistent correlations with desirable outcomes such as enhanced students' achievement or the reasons for disparities in the certification status of teachers across schools. Statistical methods include multiple regression with proportion of credentialed teachers at the school as the variable of interest (Heck, 2007); three-level hierarchical linear models with

students at level one, certification of the teacher at level two, and schools at level three (Croninger, Rice, Rathbun, & Nishio, 2007); and t-tests, correlations, and descriptive statistics that examine variations in teaching efficacy based on credential status (Paneque & Barbetta, 2006). Mohr (1982) refers collectively to the underlying assumptions and purposes of these and similar research designs as "variance theory." Also sometimes referred to as "regularity theory" (Maxwell, 2004), this approach seeks general laws and principles about the systematic relationships between inputs and outputs regarding certain phenomena. In keeping with this perspective, many of the studies in Genre 1 are designed to ascertain whether certification status is a consistent predictor of students' achievement and/or other school outcomes.

Goldhaber and Brewer's (2000) study of the relationship between variations in teacher certification status and students' learning is a good example of studies in Genre 1. Goldhaber and Brewer tested whether students who had teachers with standard certification out-performed students who had teachers without standard certifications (i.e., teachers with private school, probationary, or emergency certification, or no certification in the subject taught). Based on the results of multiple regression analysis, they found that type of certification was "an important determinant of student outcomes" (p. 139), specifically, that students of teachers who were not certified in the subject area or who held private school certification tended not to perform as well as students of teachers with either standard, probationary, or emergency credentials. However, Goldhaber and Brewer also found that "students of teachers with emergency certification in mathematics [did] no worse than students who [had] teachers with standard certification [in mathematics]" (p.139).

Goldhaber and Brewer (2000) concluded that their findings "should, at the very least, cast doubt on the claims of the educational establishment that standard certification should be required of all teachers" (p. 141). This prompted Darling-Hammond, Berry, and Thoreson (2001) to critique the methodological grounding of the Goldhaber and Brewer study, specifically their failure to account for the complex sampling of the data in their analysis and the small sample sizes of teachers with emergency or temporary certifications. Based on their own analysis of the data, Darling-Hammond et al. pointed out that the teachers in the study who held temporary or emergency credentials actually had qualifications that were similar to the qualifications of teachers who had standard certification and also that those with more training in education "appear[ed] to do better in producing student achievement" (p. 57). Darling-Hammond and colleagues argued that their finding refuted Goldhaber and Brewer's conclusion that certification should not neces-

sarily be required of all teachers. Goldhaber and Brewer (2001) rejoined by defending their decision not to account for the complex sampling within their data, stating that doing so was still an issue of controversy in the field, and pointing out that the small sample size was accounted for in the estimation of standard errors.

The point we want to emphasize here is that this debate, which was ostensibly about research methods, actually centered on the inferences that could properly be drawn about standard certification's relationship to student achievement; that is, the debate was less about issues related to sampling and more about regulations regarding barriers to bringing teachers into the profession. This debate is indicative of what Wilson and Tamir (2008) have called the "commingling of science and politics" (p. 921), a fact not lost on Goldhaber and Brewer (2001). In addition to rejoining the interpretations of Darling-Hammond and colleagues, they also declared that researchers ought to discuss their work in "a dispassionate way that focuses on rigorous, high quality empirical findings" (p. 79). This debate about the proper interpretation of one study illustrates the way research on teachers' education and outcomes is embedded within larger political agendas.

Contribution and limitations

The point of studies in Genre 1 is to report empirical tests of the basic assumption that "if one changed certification laws, one could change teacher quality" (Imig & Imig, 2008, p. 887). Thus, these studies are intended to provide empirical evidence to guide policymakers in decisions about how to invest limited human and fiscal resources in the education and professional licensure of teachers. In the current accountability context wherein teacher quality is increasingly defined in terms of students' achievement test scores and the idea of evidence-based education has now become a "common sense" notion, the valuable contribution of studies in this genre seems obvious. That is, it now seems self-evident that policy decisions, whether state regulations or institutional requirements, should be driven, at least in part, by empirical evidence and not simply by political or ideological perspectives. Studies in Genre 1 thus have great potential to provide policymakers with general guidelines about the likely impact on achievement of policies regarding teacher certification and licensure. In addition, given current concerns about the unequal distribution of well-educated and/or certified teachers in urban, poor, and other schools, studies that examine the distribution of teachers with and without certification are also essential.

However, there are important limitations to the studies in Genre 1.

First, teacher certification status is one among a number of "crude quantifiable indicators" (Kennedy, 1999, p. 89) of teachers' educational backgrounds, which cannot necessarily be used to make meaningful distinctions among the varied facets of teachers' preparation and experience or about their performance as teachers. Along these lines, we found that the findings of studies in this genre were especially sensitive to the ways samples of teachers and students were constructed, including whether and how teachers with different certification statuses were or were not lumped together under particular labels. We also found that the results of studies in this genre were highly dependent on operating assumptions about the similarities and differences between and among groups. Classification decisions were the crux of the disagreement about the Goldhaber and Brewer study mentioned above. Goldhaber and Brewer compared the scores of students of emergency-credentialed teachers to the scores of students of standard-credentialed teachers, despite the fact, according to their critics, that there was little difference in the preparation and backgrounds of teachers in those groups.

A second limitation to most of the studies in Genre 1 is that they focus solely on students' test scores as the outcome of teachers' certification status. Although test scores are important outcomes, other outcomes such as students' learning expressed in formats other than tests, students' social and emotional growth, or their preparedness to participate in democratic societies are also important goals that could be connected to teachers' certification status, but these are not considered. Finally, studies in this genre generally do not account for the contexts and cultures of K–12 schools, which vary widely. For example, they do not examine how variations in school contexts may support or constrain certified and not-certified teachers' abilities to apply and adapt the knowledge and skills they bring to the job. Given strong evidence that school cultures influence teachers' work and their ability to make effective use of resources (e.g., Cohen, Raudenbush, & Ball, 2002), this limitation is critical. As we discuss below, Genre 1 studies share several important features and assumptions with the studies in Genres 2 and 3.

GENRE 2: TEACHERS' EDUCATIONAL BACKGROUNDS AND THE TEACHER WORKFORCE

We use the phrase "teachers' educational background and the teacher workforce" as a label for Genre 2 to emphasize its focus on general aspects of teachers' education, such as courses taken and content knowledge, and how these affect the quality of the teacher workforce. For years, studies in this genre have been marshaled in debates about what content,

pedagogical, and other kinds of knowledge teachers should have; how teachers should obtain this knowledge; and how it should be assessed. Currently, studies in this genre are prominent in what Cochran-Smith and Fries (2010) argue is the dominant teacher quality discourse—"teacher quality and the knowledge economy." This discourse links the academic competency of teachers to the future capacity of their students to compete in a globalized society, which in turn determines the economic health of the nation. Studies in this genre seek to define, or at least inform, what has been called the "domain of professional knowledge and skill" needed by teachers that is "not possessed by just any educated adult" (Hill, Ball, Sleep, & Lewis, 2007, p. 112). As we suggest below, however, the research in this genre is often insufficient to support the inferences made in debates about what knowledge and skills teachers need.

Aspects of teachers' education and outcomes that are examined

Studies in Genre 2 focus on the "academic competency" of teachers, which refers collectively to the various proxies for competency used in these studies: teachers' highest degree earned, teachers' achievement in content areas (either courses taken or scores on standardized tests), and number of courses taken in particular content areas. Studies in Genre 2 examine the link between these proxies and one of the following: teacher distribution across classrooms and schools, teachers' preparedness for or persistence in teaching, teachers' practices, or student test scores.

There are two subgroups within this genre. The first includes studies that test the hypothesis that teachers with greater academic competency are more effective than those with weaker or less academic competency, as indicated by their students' test scores or by teachers' classroom practices. For example, one study aimed to predict fifth graders' math scores "by including several variables that indicate teacher performance during pre-service training—overall GPA, math GPA, and math education GPA" (Kukla-Acevedo, 2009, p. 50) along with the number of credit hours in math and math education courses. This study found a positive relationship between all five of these variables and student achievement; the author concluded that when all else is equal, "a high achieving college student is likely to be a high achieving teacher" (Kukla-Acevedo, 2009, p. 50). We found, as have others (e.g., Allen, 2003; Floden & Meniketti, 2005), that most of the studies about the impact of teachers' academic competency on students' achievement focused on mathematics (as does the study mentioned above) or, to a much lesser extent, on science, but did not examine other content areas. However, even in studies linking

the mathematical academic competency of teachers to the performance of their students, exactly what academic knowledge is important for teaching remains unclear (Hill, Schilling, & Ball, 2004).

In general, with the studies in this genre, we found that there was lack of clarity about which knowledge is actually important for teaching. And we found an almost complete absence of studies that examined the impact of academic knowledge in subject areas other than mathematics or science. These absences notwithstanding, the studies in the second subgroup of Genre 2 began with the premise that teachers' academic competency was linked to desirable outcomes for students. The purpose of these studies was to provide guidance for policymakers about how best to attract, support, and retain academically competent teachers in the profession, who were assumed to be superior. For example, one study investigated how middle school teachers with different levels of content knowledge were distributed across schools and what their practices were in those schools (Hill, 2007), making the assumption that more content knowledge for teaching was desirable and should be equally distributed across schools. A second study used the ACT scores of entering teacher candidates (obtained while in high school) as a proxy for the academic competency of teachers upon graduation from college and thereafter (Podgursky, Monroe, & Watson, 2004). They found that "[h]igh-ability college graduates [were] less likely to teach in public schools and, if they d[id], [we]re more likely to leave after a few years" (pp. 515–516). Again, this study made the assumption that it is desirable to have "high-ability college graduates" (i.e., those who scored well on high school ACT tests) enter and stay in the profession.

Theoretical frameworks and research designs

Like the studies in Genre 1, with one exception[5,] the studies in Genre 2 took a quantitative approach and generally shared the assumptions underlying variance theory, as noted above. The statistical procedures researchers used were informed primarily by economic theory, which holds that individuals with greater ability (here, academic competency) tend to be better at their work and therefore have more career options. The concept of opportunity cost for teachers, especially for highly competent teachers (Murnane, Singer, Willet, Kemple, & Olsen, 1991), is present in several studies (e.g., Weiss, 1999); several other studies (e.g., Fetler, 1999) examine relationships between school resources and teacher attrition (Hanushek, 1996). The assumption of many of the studies in Genre 2 was that because high ability teachers have more career options available to them, they might be more likely to leave the

profession or choose to work only in the most desirable schools. However, there was very little agreement in the Genre 2 studies about what makes a teacher academically competent; that is, there was no common definition of academic competency across studies, and there was wide variation in the proxies used to account for academic competency.

Like the studies in Genre 1, many of the studies in Genre 2 employed complex statistical models. For example Adkins and Moomaw (2005) examined how schools allocated resources in order to get a return on student test scores using a frontier production function. Several studies, including Strunk and Robinson (2006) and Smith, Desimone, and Ueno (2005), used hierarchical linear models to account for factors at the student, classroom, and sometimes the school or state level. Statistical techniques such as these typically require large data sets and great precision in the measurement of the outcome of interest. These types of large-scale studies may be most useful in addressing policy issues at the district, state, or national level.

Contribution and limitations

Many of the studies in Genre 2 are intended to inform policy related to improving the academic competency of teachers in order to improve the overall performance of students in the nation's schools, which in turn is assumed to improve the capacity of the nation to compete in the global economy. Similar to the point we made about Genre 1, it is worth noting that with Genre 2, there is an important and not often acknowledged difference between the genre's two subgroups in terms of the assumptions that are actually tested empirically. The relatively small number of studies in the first subgroup of Genre 2 actually tested empirically the hypothesis that teachers' academic competence (particularly subject matter knowledge) had an impact on students' achievement or other desirable outcomes. These studies concentrated almost exclusively on teachers' academic competency in mathematics. Interestingly, however, the much larger number of studies in the second subgroup of Genre 2 began with the premise that teachers' academic competence affected students' achievement. However, these studies were not restricted to the particular grade levels or subject areas for which this assumption had previously been empirically tested. Further research is needed about the ways that teachers' academic competency relates to student achievement to fill the gaps in understanding.

If we restrict the inferences from these studies only to the available empirical evidence, the studies in the first subgroup of Genre 2 tell a fairly limited yet cohesive story: Teachers' with greater academic

competency in mathematics tend to have students with higher achievement on test scores in these areas and also are more likely to report that they engage in desirable teacher practices in math and science instruction. The studies in the second subgroup of Genre 2 indicate that academically competent teachers are not uniformly distributed across schools and classrooms and tend to leave the profession at higher rates than their less academically able peers. However, the link between the academic competency of teachers and the academic performance of students is actually empirically documented only for the subject area of mathematics, even though this link is often assumed in policy debates.

Despite the use of large-scale studies and complex statistics, there are obvious limits to the capacity of studies in Genre 2 to guide policy given the lack of a clear chain of evidence that supports each of the links in the logic about what policies should be in place. The lack of evidence aside, the studies in this genre that focus on the distribution of academically able teachers are consistent with the teacher quality gap discourse and with the increasingly popular belief (e.g., Education Trust, 2008) that one solution to the teacher quality problem in the United States is the recruitment and more equitable distribution across schools of talented and academically able teachers, even if this means bypassing university-recommended teacher preparation programs and regular certification and licensure requirements. Cochran-Smith and Fries (2010) argue that the teacher quality gap discourse is often connected to the knowledge economy discourse, as illustrated in a recent McKinsey & Company report (Auguste, Kihn, & Miller, 2010). This report argues that in order to improve teacher quality in the United States and avoid the disastrous economic impacts brought on by achievement gaps, there needs to be a sharp increase in the proportion of beginning teachers from the top third of their college graduation classes. Interestingly, even the McKinsey report, which makes a very strong call for teachers with stronger academic backgrounds, recognizes that the research on whether U.S. teachers' academic background predicts effectiveness is "very mixed" (McKinsey & Company, 2009, p. 5). This recognition is consistent with our analysis of the findings from the research in this genre and indicates that policies aimed at upping the recruitment of academically able individuals into teaching are premature, pending further evidence.

GENRE 3: ENTRY PATHWAYS INTO TEACHING AND THEIR CONSEQUENCES

We use the label "entry pathways into teaching and their consequences" for the studies in Genre 3 to emphasize their focus on relationships

between teachers' entry pathways into teaching and indicators of their effectiveness as teachers. The phrase "entry pathways" is intended to capture major variations in the structures, organizational arrangements, timing, location, and sponsorship of teacher preparation programs and certification routes as well as some of the major structural variations among university-sponsored preparation programs, such as four- or five-year programs, internship models, and professional development school models.

Studies in this genre have been used as evidence in highly politicized controversies about "traditional" and "alternate" routes into teaching for the last two decades. Proponents have argued that alternate routes help to diversify the teacher population, alleviate shortages in critical content areas, and provide hard-to-staff schools with access to quality teachers. From this perspective, traditional university-sponsored programs and certification regulations are considered barriers to entry to the teaching profession. On the other hand, opponents have argued that alternate routes exacerbate existing inequities in hard-to-staff schools because students are continuously exposed to teachers with minimal preparation and classroom experience. Studies in this genre currently are called upon in the teacher quality gap discourse and in discourses linking teacher quality to the market and to the knowledge economy (Cochran-Smith & Fries, 2010). Although different from one another in critical ways, in each of these three discourses, the current educational system is depicted as the cause of educational failure in the United States, and a central part of the solution is the establishment of new avenues into teaching coupled with a system of accountability based on measurable outcomes, particularly students' achievement. It is important to note, however, that studies in this genre are also used in the discourse about teacher quality and professional teacher education wherein it is assumed that professional teacher education is part of the solution to the teacher quality problem, rather than part of the problem.

Aspects of teachers' education and outcomes that are examined

Studies in Genre 3 are designed to investigate the link between teachers' entry pathways into teaching and postentry outcomes, such as students' achievement, teacher retention, teachers' sense of preparedness, and teaching performance. By accounting for differences in teachers' entry pathways, a number of the studies in Genre 3 examine whether differing levels of student achievement can be attributed to particular certification and preparation programs, such as Teach for America, the New York City Teaching Fellows Program, particular university-sponsored programs, or

others (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2006, 2009; Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005; Glazerman, Mayer, & Decker, 2006; Kane, Rockoff, & Staiger, 2008). These studies pose questions such as: "Do Teach for America teachers improve (or at least, not harm) student outcomes relative to what would have happened in their absence?" (Glazerman et al., 2006, p. 77), "How do the achievement gains of students differ by the teaching pathway of their teachers?" (Boyd et al., 2006, p. 190), "[How do] teacher preparation and certification influence teacher effectiveness for both Teach for America and other teachers?" (Darling-Hammond et al., 2005, p. 3), and "What is the relationship between teachers' pathway and students' test scores in mathematics and reading in New York City?" (Kane et al., 2008). The intention here is to produce empirical evidence that speaks to the issue of alternate routes into teaching as a public policy problem.

A subgroup of studies in Genre 3 examines the experiences of teachers who entered the profession through alternate certification pathways. Like the studies above, these are intended to contribute to policy debates about alternate certification, but unlike the studies above, these do not attempt to connect specific entry pathways to variations in student achievement. Rather these studies analyze the collective experiences of teachers identified as entering the profession through alternate routes. These studies ask questions such as, "How might alternative teacher education programs influence the practice of their graduates?" (Good et al., 2006, p. 413), and "[What are the] issues related to alternate route teachers' transition process?" (Nagy & Wang, 2007, p. 98).

A third group of studies in Genre 3 focuses on variations in structural aspects of university-sponsored "alternative" programs and their impact on retention, teachers' effectiveness, and sense of preparedness. In contrast to the first group of studies in this genre, which define teacher effectiveness in terms of students' achievement, this group of studies defines teacher effectiveness in a variety of ways, including teachers' self-reported practices, principals' perceptions, and observed teaching behaviors. Some studies focus on professional development school (PDS) models (e.g., Latham & Vogt, 2007; Reynolds, Ross, & Rakow, 2002), defined as a purposeful collaboration between universities and K–12 school communities (Ridley, Hurwitz, Davis Hackett, & Miller, 2005). These studies are designed to compare the retention rates and effectiveness of teachers prepared through PDS models with those who completed non-PDS university-sponsored preparation programs. Here, studies ask questions like, "[What is the] impact, if any, of preparation method (PDS versus non-PDS preparation) on teacher attrition rates?" (Latham & Vogt, 2007, p. 155) and "[Does] an intensive, PDS-based teacher education program

. . . prepare teachers of greater effectiveness than [does] a traditional, campus-based program?" (Ridley et al., p. 48). A handful of studies concentrate on university-sponsored alternative routes into teaching, which pair coursework with things such as intensive experiences in the K–12 classrooms and continuous mentoring (Jorissen, 2002; Miller, McKenna, & McKenna, 1998; Salyer, 2003). These studies pose questions such as, "What factors contribute to graduates' feelings of satisfaction and support?" (Jorissen, 2002) and "What are the differences in effectiveness between graduates of a university-sponsored 'alternate' program and those from a variety of traditional preparation programs?" (Miller et al., 1998).

Theoretical frameworks and research designs

Few of the studies in Genre 3 explicitly present an articulated theoretical framework. This research is generally framed in terms of the goals of alternate routes, mainly that such programs can ameliorate the anticipated shortages of qualified teachers and attract talented individuals to the teaching profession. There are many disagreements about whether alternate programs can achieve these goals and whether traditional programs are truly barriers to the profession. Cohen-Vogel and Smith (2007) explicitly unpack the four core assumptions that underlie alternate routes: "(a) will attract people from outside education to teach, (b) improve the quality of teacher candidates, (c) fill positions in hard-to-staff schools, and (d) help alleviate out-of-field teaching" (p. 734). Fleener and Dahm (2007) frame the issue of alternate certification around the high cost of teacher attrition on schools; professional development schools are proposed as a model to reduce the negative effect of attrition. Jorissen (2002) utilizes a framework of professional integration and seeks to identify the components of an alternative certification program that influence teachers' satisfaction and decision to remain in the classroom.

As with Genres 1 and 2, most of the studies in Genre 3 utilize complex statistical methods to examine the relationship between teachers' entry pathways and outcomes such as retention, student achievement, and effectiveness. Statistical methods include multivariate analysis of variance (Miller et al., 1998; Ridley et al., 2005), ordinary least squares regression (Darling-Hammond et al., 2005), multiple regression (Boyd et al., 2006), survival analysis (Fleener & Dahm, 2007), and value added regression (Boyd et al., 2009). However, unlike the research in previous genres, there are also several studies in Genre 3 that used qualitative (Jorissen, 2002; Salyer, 2003) or mixed-method approaches (Miller et al., 1998;

Reynolds et al., 2002). Here, researchers utilize data collection strategies such as interviews focused on teachers' commitment to teaching and satisfaction with their entry pathway (Reynolds et al., 2002), classroom observations to better understand teachers' effectiveness (Ridley et al., 2005), and open-ended questionnaires to garner the most satisfying aspects of teachers' entry pathways and induction support (Jorissen, 2002).

Contributions and limitations

The studies in Genre 3 have the potential to contribute to policy discussions about alternate routes. Although alternate entry pathways into teaching continue to be a contentious issue, they are now an integral component of teacher preparation and certification in all 50 states. In 2009, the $4.3 billion Race to the Top Fund endorsed the development of "high-quality alternate" pathways into teaching. To be eligible for the funding process, states were urged to adopt policies in support of alternate certification routes, defined as those that "allow for providers in addition to institutions of higher education" (U.S. Department of Education, 2009). As more entry pathways into teaching are established throughout the country as a result of federal funding, studies like the ones highlighted in Genre 3 are likely to be foregrounded in debates about the most effective elements and effects of alternate certification programs.

On the other hand, there are important limitations to these studies, some of which have to do with how alternate and university-sponsored graduates and programs are identified and compared. To make claims about the effectiveness of alternate programs, researchers often compare the experiences of teachers from multiple pathways (e.g., TFA, university-sponsored programs, and PDS models) to graduates of traditional programs (e.g., Cohen-Vogel & Smith, 2007; Good et al., 2006; Nagy & Wang, 2007). However, little information is provided about the specific programmatic features, experiences, or characteristics of teachers who entered the classroom through alternate pathways. Such studies treat alternate pathways teachers as a homogeneous group and do not account for variations among and between the entry pathways. Other studies (Latham & Vogt, 2007; Sayler, 2003) treat graduates of traditional programs as if they were a homogeneous group. As Zeichner and Conklin (2005) rightly point out, without rich detail about the types of programs completed by teachers, it is challenging to "disentangle the influence" of entry pathways on particular outcomes (p. 663). To understand better the most salient characteristics for teacher development and student

achievement, future studies need to closely account for differences in pathways as well as for the attributes of teachers who opt to enter the profession through alternate and traditional means.

GENRE 4: TEACHER PREPARATION PROGRAMS AND THEIR GRADUATES

The studies in Genre 4, "teacher preparation programs and their graduates," focus on the graduates of particular teacher preparation programs (usually university-sponsored) in order to determine whether and how graduates enact the program's mission and curricular goals, whether graduates feel well-prepared for the work of teaching, and/or how well and how long they teach. Some of the studies in this genre can be understood as a response by the teacher education community to shifting notions of accountability from primarily inputs to primarily outcomes, which were reflected in the reporting requirements that followed the 1998 reauthorization of Title II of the Higher Education Act. Shifting ideas about accountability for outcomes were also reflected in the new standards of teacher education's national and regional accreditors, which required preparation programs to produce credible evidence of the knowledge and demonstrated skills of the teachers they prepared (e.g., Murray, 2005; Williams, Mitchell, & Leibbrand, 2003).

The audience and purpose of most of the studies in Genre 4 stand in sharp contrast to the audiences and purposes of those in Genre 3 as well as Genres 1 and 2, which are designed primarily to inform state and federal policies related to teacher quality and teacher preparation. In contrast, the primary purpose of the studies in Genre 4 is to influence local policy and practice regarding teacher preparation at the institutional level and, ultimately, to influence larger debates about teacher quality and professionalization, the discourse Cochran-Smith and Fries (2010) refer to as "teacher quality and professional teacher education."

Aspects of teachers' education and outcomes that are examined

Genre 4, which is the largest of the genres we identified in terms of number of studies, includes studies that examine relationships between participation in various teacher education programs or projects, on the one hand, and the perceptions, performance, and career trajectories of program graduates on the other. Many studies in this genre concentrate on programs housed in university schools of education, although a few trace the experiences of participants in nontraditional pathways into teaching, such as the Massachusetts Signing Bonus Program (Liu, Johnson, &

Peske, 2004). In this way, the studies directly address controversies about both the content and pedagogical knowledge teachers should have prior to teaching and how and where educators should be prepared for their roles. Here it is important to note the distinction between Genre 4 and Genre 3. Rather than comparing graduates from different programs and pathways as the studies in Genre 3 do, nearly all of the studies in Genre 4 focus on graduates from the same programs to examine whether and how a program's curriculum and mission are carried out in the work of its teachers.

All of the studies in Genre 4 focus on the graduates of particular teacher preparation programs and one or more of the following outcomes: career paths, beliefs, practices, and sense of preparedness. The largest subgroup of studies in this genre focuses on teachers' career paths by examining the attrition, retention, and/or migration patterns of teachers who had graduated from the program. These studies ask questions such as, "Why do graduates of this program stay in teaching at higher rates than others?" (Lau, Dandy, & Hoffman, 2007) and "What influences how teachers who graduate from a program committed to preparing teachers for high-poverty, urban environments make decisions to stay with or leave their jobs?" (Freedman & Appleman, 2009).

Other studies in Genre 4 examine the impact of program participation on teachers' beliefs, asking questions such as, "How successful is a program at changing the beliefs of its graduates?" (Cobb, 2001) and "How were teachers' literacy related instructional beliefs affected by learning to teach in a high stakes testing environment?" (White, Sturtevant, & Dunlap, 2003). A third and related focus of some of the studies in this genre is pedagogical practice, instantiated in questions such as, "How do teacher candidates assess growth in pedagogical knowledge and advocacy at end of program and one year after graduation?" (Merino & Holmes, 2006) and "How does teachers' preparation in a reading program relate to their teaching practices?" (Hoffman et al., 2005). Another outcome studied in Genre 4 is teachers' sense of preparedness, illustrated by research questions such as, "How effective is the program for the preparation of beginning teachers?" (Fry, 2007) and "Given a program's commitment to advocate for educational equity, what do graduates report about specific program strengths and problems in preparing them for this work?" (Athanases & Martin, 2006)

Theoretical frameworks and research designs

One way to think about these studies collectively is that, unlike the studies in Genres 1, 2, and 3, which conceptualize teacher education as a

policy problem, the studies in Genre 4 tend to construct teacher educa-
tion as "a learning problem" (Cochran-Smith & Fries, 2005), wherein the
focus is on what teachers know and how their ideas about teaching and
learning emerge and evolve over time and in varying circumstances. As
such, most of the studies within Genre 4 work from broad social construc-
tivist theoretical frameworks, assuming that graduates' beliefs, practices,
preparedness, and willingness to remain in the profession are shaped by
the interactions of their experiential backgrounds and values and their
varying experiences of the teacher preparation programs in which they
participated. Along these lines, Levin and Ammon (1996) offered a par-
ticularly intricate theoretical framework developed from a model of
teachers' pedagogical thinking using data from journals and interviews
of preservice and inservice teachers in their program. Using the result-
ing cognitive and developmental theoretical framework (The Ammon
and Hutcheson Model of Pedagogical Thinking), Levin and Ammon
investigated how personal and professional influences in a teacher's life
contributed to the development of his pedagogical thinking during his
early career.

   In addition to broad theoretical similarity among the studies in Genre
4, there is also methodological consistency. The majority of studies use
broadly consistent qualitative approaches to capture how specific teacher
education programs influence teachers' beliefs, practices, preparedness,
and retention. Researchers in this genre tend to use similar data collec-
tion strategies, such as interviews to garner teachers' plans for the future
(e.g., Anderson & Olsen, 2006); observations to get a sense of teachers'
classroom instruction, teaching style, and classroom dynamics (e.g., van
Hover & Yeager, 2004); teacher candidates' journals to inform case stud-
ies of teachers (e.g., Costigan, 2005); and surveys to measure develop-
mental change (e.g., Watzke, 2007). A few of the studies in this genre
utilize mixed-methods research designs, using quantitative data from sur-
veys or classroom observations alongside data collected from qualitative
instruments to develop a more complex understanding of the impact of
teacher education programs (e.g., Quartz et al., 2005).

Contributions and limitations

Collectively, the studies in Genre 4 make an important contribution to
the larger discourse about teacher quality and professional teacher edu-
cation (Cochran-Smith & Fries, 2010) by showing that, on the whole, pro-
fessional teacher education has the power to shape teachers' beliefs and
practices, especially when the program's focus is consistently clear
throughout course and field offerings. What the studies in this genre

have in common, more so than any of the other genres discussed so far, is the desire to systematically investigate what goes on in teacher preparation programs. The kind of in-depth analysis Genre 4 studies offer is not possible with the other research genres we have discussed so far. Specifically, the point of many of the studies in Genre 4 is to assess the effectiveness of programs in terms of graduates' beliefs, practices, and retention rates, and thus provide insights that can be useful to larger contemporary debates about university-sponsored teacher preparation programs. It is important to note that the studies in Genre 4 are often conducted by people affiliated with those programs in some way. This suggests that many schools of education are actively engaged in assessing their own effectiveness, responding to recent calls for greater accountability in higher education generally and teacher education particularly (Wineberg, 2006). Thus, the studies in this genre reflect the larger shift in teacher education accountability from external policy to internal practice at the same time that they generate knowledge that can be used both in local programs and more broadly.

There are important limitations to the studies in Genre 4, however, including the fact that many of the studies are conducted with small populations that are not amenable to generalizations, which are valued in the current standards and accountability movement. Still, it is important to note that some of these small-scale studies are part of larger research studies. Another limitation to the studies in this genre is their lack of attention to the school contexts that teacher candidates ultimately enter. Although several of the studies discussed the school contexts their graduates worked in once they left their teacher education programs, most did not study these in enough depth to capture the nuances of the effects these environments had on teachers' abilities to maintain the beliefs, goals, and practices they had after leaving their respective programs. Because these studies essentially ask questions about how a particular program affected its graduates, it is not surprising that the focus is on the teachers' beliefs and practices. However, it is also important to know how those graduates' beliefs and practices are shaped by the contexts in which they teach after they leave their programs.

The major limitation to this body of work is that it does not connect teacher candidates' learning, beliefs, and performance to their students' learning. In then-Secretary of Education Roderick Paige's first report to Congress on teacher quality (U.S. Department of Education, 2002), he charged that research showed that teachers' education courses did not improve students' achievement. In a more recent report recommending a stronger accountability model for teacher education, Crowe (2010) contended that the accreditors who oversee teacher education programs

ignore K–12 student performance, instead focusing only on the program graduates' learning. As noted earlier, one of the controversies driving the teacher preparation debate is what standards should govern teacher preparation, including the outcomes for which programs should be held accountable. Although it is problematic to evaluate teacher quality solely on the basis of student learning, in order to be taken seriously by policymakers and to shape the debates about teacher education, program research may need to develop more ways to account for the learning of students taught by their graduates and not assume that well-prepared teachers who appear to adopt a program's mission and goals necessarily produce student achievement gains.

GENRE 5: TEACHER PREPARATION AND LEARNING TO TEACH IN THE EARLY CAREER YEARS

We use the phrase "teacher preparation and learning to teach in the early career years" to categorize in-depth analyses of teachers' experiences learning to teach during and soon after the teacher preparation period. Here "learning to teach" includes everything from the enactment of a particular pedagogical approach to the development of dispositions about student learning or about one's commitment to the profession. Although the studies in Genre 5 are distinguishable from those in Genre 4, these two genres are closely related. As we indicated in the previous section, Genre 4 typically includes self-studies of university-sponsored teacher preparation programs, intended to determine whether programs meet their accreditors' and their own high expectations. In contrast, the studies in Genre 5, although most are linked to teacher preparation programs in some ways, investigate the phenomenon of learning to teach more generally, and do not focus only on implementation of the mission and curricular goals of single or particular teacher education program.

Studies in Genre 5 investigate how teachers' pedagogies or dispositions, which developed during the preparation period, interact with the myriad teaching and nonteaching responsibilities that teachers encounter once in schools as full-time teachers. In addition, then, to aiming to influence institutional and professional teacher education policy and practice, as the studies in Genre 4 do, studies in Genre 5 also aim to develop broader knowledge about how teachers learn and put into practice the pedagogical skills and professional attitudes that are critical in the development of competent, effective, and committed educators.

Similar to Genre 4, many of the studies in Genre 5 are framed in terms of controversies regarding the preparation and/or on-the-job development that nurture the creation of effective professionals and/or the

pedagogical knowledge and classroom experience necessary for effective teaching. Instead of evaluating a particular preparation program by examining the extent to which graduates of that program live out the program's mission and goals, the studies in Genre 5 investigate the many complex factors that shape teachers' instructional, assessment, and curricular practices and also influence changes in their beliefs, attitudes, and professional activities.

In particular, studies in Genre 5 treat the realities of teachers' early career years as a crucible for the strengths of their beliefs about teaching and/or for the effectiveness of the strategies and practices learned during preservice preparation. These studies aim to open up the black box of school context by examining how teachers learn to teach in the context of challenges common to the early career. Many of the studies in this genre examine teacher learning and development in challenging settings, such as under-resourced and hard-to-staff schools. Although critics claim that preservice teacher preparation is disconnected from actual classroom practice (e.g., Hess, 2011), the studies in this genre aim to improve university-sponsored preparation by generating knowledge about the factors that influence teaching practice in school contexts. As we discuss below, by seeking greater understanding of school contexts, these studies aim to enhance the relevance and effectiveness of university-sponsored preparation programs.

Aspects of teachers' education and outcomes that are examined

The studies in Genre 5 fall roughly into two subgroups. The first subgroup consists of studies that ask general questions about how school-level factors influence teaching practice during the early career years. These studies ask questions such as, "What are the possible factors in the first years of teaching that might be related to changes in [teachers'] efficacy?" (Hoy & Spero, 2005) and "What is it like to learn to teach in an urban setting?" (Donnell, 2007). These studies investigate changes in teachers' attitudes and beliefs, especially regarding their career goals and sense of preparedness, as well as changes in teaching practices as teachers make the transition from preservice preparation to professional practice.

The second subgroup of studies in Genre 5 focuses on teaching practices in particular areas, such as teaching literacy or teaching with regard to particular dispositions or perceptions, such as teachers' ideas about effective classroom practices and effective schools. These studies ask questions such as, "What influences beginning teachers in an urban setting as they translate and implement a particular aspect of their writing

curriculum into practice?" (Pardo, 2006) and "What factors affect teacher learning from curriculum materials?" (Grossman & Thompson, 2008). The studies in this subgroup cover a wide range of topics including teaching grammar (Smagorinsky, Wright, Augustine, O'Donnell-Allen, & Konopak, 2007), advocating for students (Athanases & de Oliveira, 2007), and developing reflection/inquiry skills (Lyons, 1998).

Theoretical frameworks and research designs

Aimed at understanding how learning to teach and teacher performance are mediated by various social, cultural, and organizational contexts over time, many of the studies in Genre 5 work from broad sociocultural perspectives (e.g., Artiles, Barreto, Pena, & McClafferty, 1998; Grossman & Thompson, 2004; Pardo, 2006), which conceptualize teacher learning in terms of iterative and dynamic interactions with its social context. A number of the studies in Genre 5 use activity theory (e.g., Grossman & Thompson, 2008) or cultural historical activity theory (e.g., Smagorinsky, Cook, Moore, Jackson, & Fry, 2004) to analyze how teachers "adjust to the local social circumstances and strive to co-construct shared understandings" (Artiles et al., 1998) about what it means to teach effectively. Some studies that examine teacher career decisions apply organizational workplace theory to school settings in order to understand the factors that influence teachers' professional trajectory (e.g., Johnson & Birkeland, 2003).

   In keeping with these theoretical frameworks, studies in Genre 5 commonly gather data through semistructured interviews, focus groups, and participant observations in classrooms. Although a few studies account for the preservice period retrospectively by asking teachers to reflect on their preservice experiences, most studies gather real-time data during teachers' preservice and inservice experiences. In nearly all of the studies in this genre, the data from qualitative sources are analyzed using constant-comparative analysis of interview and observation data or other forms of analytic induction that are common to qualitative research. Analyses typically organize data into prevalent or overarching themes and assertions.

Contributions and limitations

Research in Genre 5 offers two primary contributions to understanding teachers' education and its outcomes. First, although studies in some of the previous genres typically reduce teaching quality to gains in student test scores, the studies in this genre contribute to a more nuanced

understanding of the complexities of teaching, especially during the early career. The studies in this genre work from a problematized notion of teacher quality, seeking greater understanding of what it means, for example, to teach literacy (e.g., Grossman & Thompson, 2008) or advocate for students (Athanases & de Oliviera, 2007). By understanding teaching as more than preparation for high-stakes tests, these studies provide greater insight into how preparation programs, of all kinds, can help to improve teacher quality.

Second, the studies in Genre 5 ask questions that have important implications for how teachers' education programs prepare graduates to incorporate reform- and social justice–oriented teaching practices into their instruction and, as a result, more effectively meet students' needs. In this way, the studies in this genre can be understood as a response to a complicated web of critiques, suggesting that university-based teacher education adds little value to teachers' effectiveness. By conceptualizing learning to teach as a process that is highly mediated by the social context of schools, these studies can be understood in part as responses to critics who claim that university programs are out of touch with or unresponsive to the complicated and changing realities of today's school (see Michelli & Earley, 2011).

In spite of these contributions, there are important limitations that prevent the studies in this genre from offering deeper insight into the transition from preservice preparation to the classroom. Some of these studies examine teacher learning only during the first year of a teacher's career (e.g., Diffily & Perkins, 2002). Questions about practice are asked independently of some measure of teachers' commitment to the profession. As a result, these studies do not provide insights into the complexity of teacher learning and development over time. Conceptualized this way, the insights generated by studies in Genre 5 about the preparation and learning experiences that best foster the development of competent, committed educators are incomplete.

GENRE 6: LIFE HISTORIES AND TEACHERS' BELIEFS AND PRACTICES

Genre 6, the smallest genre in our review, focuses on "life histories and teachers' beliefs and practices," and includes studies that explore teachers' individual experiential backgrounds and beliefs and the impact of these on teaching. Although we locate these studies within the larger body of work analyzed in this review, they are distinct from the other genres because their topic of study—life histories or experiential backgrounds—is more diffuse and amorphous than certification status, academic competency, or participation in a particular preparation program

or entry pathway. Although the "life history" of a teacher may include general academic experiences and/or participation in a particular teacher preparation program or pathway, it also includes many other general experiences, such as aspects of socialization and development. Studies in this genre thus illuminate aspects of teachers' education and lived experiences, such as the impact of age, race, gender, and social class on teachers' development and career paths, which are not captured within the other genres. There are currently a number of controversies about how to both boost teacher quality and diversify the teacher workforce. The latter are based on the assumption that teachers of color provide role models for students of color and may be more effective in boosting their achievement (National Collaborative on Diversity in the Teaching Force, 2004; Villegas & Lucas, 2004). Given these goals, studies in Genre 6 have the potential to generate important insights about the recruitment, support, and retention of teachers of color.

The purpose of studies in this genre is to illuminate teachers' lived experiences and document their experiences over time. Unlike the studies in Genres 4 and 5, which focus on the impact of programs or the contexts in which teachers make the transition into teaching, the focus of studies in Genre 6 is on teachers as individuals. They examine the impact of teachers' lived experiences on their enculturation into the profession.

Aspects of teachers' education and outcomes that are examined

Several of the studies investigate how teachers' backgrounds influence their beliefs. For example, Brown's (2005) case study, which focuses on two teachers who entered the teaching profession after the age of 40, examines how older beginning educators' perceptions of teaching "match up to their reality of teaching" (2005, p. 638). Skerrett's (2008) self-study poses a somewhat similar research question, focusing on how "biography and identity influence the lived experiences of teaching and the researcher stance" (p. 143).

Theoretical frameworks and research designs

Many of the studies in this genre are guided by general sociocultural theories, most often identity theory. These theories assume that a teacher's individual life experiences and past personal choices profoundly shape how teacher education is interpreted, curriculum is developed, and instruction is enacted in the classroom. In addition to similar theoretical frameworks, these studies shared common research methods, including interviews and observations within a narrative or phenomenological

framework. Most of the studies in Genre 6 utilize interviews as the primary means to capture how a teacher's background (beyond teacher preparation) influences his or her practice and/or beliefs. Brown (2005), for example, uses Seidman's phenomenological interview technique to examine the connection between the life histories of older beginning teachers and their classroom experiences. Classroom observations and life history interview data are used by Urrieta (2007) to better understand how Chicana/o teachers became educator activists. Skerrett (2008) also drew upon qualitative data, utilizing self-study data to reflect upon her professional and cultural biography and discuss how it influenced her decision to enter the teaching profession and later teacher education. This analysis led to recommendations about how to restructure teacher education to better prepare teachers for urban schools.

Contributions and limitations

As mentioned earlier, the studies in Genre 6 focus on the relationship between teachers' individual backgrounds and beliefs and their experiences in the profession. Through this life-history lens, which is unique to the studies in this genre, researchers focus on the complexities of teachers' lives and how they relate to experiences in the classroom. Genre 6 studies utilize teachers' life histories to illuminate teachers' responses to and uses of reform-oriented curricula, their decisions to remain in or leave the profession, and their practices in the classroom.

Interestingly, despite investigating different research questions, all of the studies focus on the experiences of teachers in schools with high concentrations of low-income families and minority students, illuminating how these contexts shape teacher development and instruction. This developing area of research has the potential to inform teacher preparation programs about the influence of personal experiences on teaching decisions and practices as well as to help create a better understanding of the programmatic structures and features of teacher education programs that may exacerbate the present shortfall of multicultural teachers.

There are also limitations to the studies in Genre 6. Many of the studies are conducted with either very small populations (Brown, 2005; Levin, 2001) or based on self-study (Skerrett, 2008). Due to the scale and purpose of these studies, the findings may not be applicable to other content areas (e.g., language arts, social studies, or science) or other teacher preparation programs. In addition, most of the studies in this genre do not account for changes over time as the result of the complexities of teaching contexts and the cultures of K–12 schools. With the exception of Levin (2001), who investigated the impact of life history on a single

teacher's practice over a number of years, the rest of the studies in this genre present only a limited view of teachers' experiences in the classroom.

MAPPING THE RESEARCH TERRAIN: CROSS-GENRE CONCLUSIONS

The preceding conceptual analysis is based on all of the published studies we could locate since 1998 that empirically examine the connection between some aspects of teachers' education and some specific posteducation outcomes related to teachers, their students, or schooling. The review cuts across methodologies, disciplines, policy contexts, and purposes. This is important because, as we noted in the introduction, multiple approaches to the study of teachers' education and outcomes are seldom combined in the same review or even in the same discussion. In contrast, this review attempts to conceptually map the full research terrain on the topic.

   As our analysis reveals, over the last decade there have been six distinguishable genres of empirical research that examine connections between particular aspects of teachers' education and specific posteducation outcomes. As we have shown, each genre is positioned in relation to one or more policy and political controversies related to teacher quality by means of how it constructs and frames the research problem, what the stated (or implied) research purpose is, what arguments are made about the implications of the research for local and/or larger policies and practices, and what audiences and uses are implied or stated. In this sense, contemporary controversies about teacher quality and teacher education, which are embedded within larger political debates about accountability and the purposes of public education, can be understood as social and political factors that have shaped the development of these research genres. As our analysis shows, however, the research genres are also strategically deployed to shape and inform larger debates. In concluding this article, we look across the research terrain and make four concluding points about implications and directions forward.

GETTING TO OUTCOMES

By design, all the studies in this review are outcomes studies; that is, as noted above, we selected for this review only those studies that empirically investigated the connections between particular aspects of teachers' education (including, but not limited to, certification status, general academic competency, and life experiences as well as participation in preparation programs, pathways, and school contexts) and one or more

posteducation outcomes (including, but not limited to, students' learning and teacher workforce distribution as well as teachers' beliefs and practices, career trajectories, commitments, and sense of preparedness). In zeroing in on only those studies that connect teachers' education with outcomes, we worked from the assumption that many current controversies about how teachers ought to be educated and licensed are grounded in public skepticism about whether formal teacher preparation and certification are actually necessary at all, an increasingly popular sentiment exacerbated by the lack of consensus about the empirical evidence and by the proliferation and current privileging of alternate pathways and programs. Our intention in embarking on this project was to inform the debate with an up-to-date analysis of the competing ways researchers with different purposes and goals have constructed and empirically investigated the connections between teachers' education and outcomes.[6]

One somewhat surprising finding of our review is that there continues to be a relatively small number of peer-reviewed studies that empirically connect teachers' education and posteducation outcomes in the U.S. context. As noted, we located only about 120 such articles and reports since 1998, and even this number is slightly inflated because some individual articles were based on the same larger studies. This small number of recent studies is no doubt a consequence of many of the same conditions named in the report of the AERA Panel on Teacher Education and Research (Cochran-Smith & Zeichner, 2005), which pointed to the small number of outcomes studies in teacher education published up until approximately 2002: little funding, lack of reliable databases, few established measurement instruments, limited research expertise, and inadequate infrastructures.

Since 1999, however, a number of relatively large federal Teacher Quality Enhancement grants have been awarded with the intention of improving teachers' preparation and students' learning, and initiatives such as the Carnegie Corporation of New York's Teachers for a New Era project have invested millions of dollars in efforts to enhance the impact of selected university-sponsored teacher education projects on student outcomes. In light of these national priorities and current efforts in some states to establish databases linking teachers, students, and teacher education programs, we had anticipated there would be a greater number of recent studies investigating teachers' education and outcomes. However, as Shirley (2006) rightly points out, the federal teacher quality grants were conceptualized as reform projects, not research studies, and the same was true for the Carnegie project. We suspect that the lack of recent teacher education outcomes studies partly has to do with the competing purposes of major initiatives and also has to do with the challenges involved in

parlaying locally generated evidence about particular teacher education programs or regions into knowledge that is useful on a larger scale.

PURPOSES AND AUDIENCES: LOOKING ACROSS THE GENRES

The coherence and internal consistency of each of the six genres we identified is derived primarily from the aspects of teachers' education they studied, the theoretical and methodological frameworks they used, and the purposes they served. Each genre studied one key aspect of teachers' education—certification/licensure, academic competency, pathways/program structures, program curriculum/mission, the transition from preparation to teaching, or life histories. In contrast, within every genre, multiple posteducation outcomes were examined. For example, studies in Genre 2, which targeted academic competency as the key aspect of teachers' education, tested whether or not academic competency was correlated with students' test scores, teachers' sense of preparedness, teacher retention, and distribution of teachers across schools. Along similar lines, studies in Genre 4, which studied program curricula/mission as the key aspect of teachers' education, explored how mission shaped retention, beliefs, pedagogy and practice, and sense of preparedness over time.

The variegated configuration of within- and cross-genre outcomes suggests both connections and disconnects between and among the six genres that examine teachers' education and posteducation outcomes. These have to do primarily with the differing purposes of the research and also reflect the complex web of national, state, and local agencies and professional organizations that establish or influence policy regarding teacher quality and teacher education. Most of the studies in Genres 1 and 2 and some of those in Genre 3 are conducted by public policy researchers, sociologists, economists, and other social scientists. They are generally based on quantitative research designs, many using complex statistical procedures and large-scale databases. Informed by labor market and workplace theory, their goal is to generate empirical evidence to inform federal and state policies regarding the certification and distribution of a high quality teacher workforce.

In contrast, some of the studies in Genre 3 and most of those in Genres 4, 5, and 6 are conducted primarily by researchers interested in the processes of learning to teach and teachers' development and career paths over time; many of these researchers are also teacher education practitioners in university or other programs. These studies are generally qualitative, many employing longitudinal interview and observational data with relatively small populations, although some also use survey data

and somewhat larger databases. This latter group of studies is informed by broad social and cultural perspectives regarding teaching and learning with the goal of understanding the contexts and conditions that shape beginning teachers' work as they make the transition from preparation to practice and also shape their career decisions. It is important to note that, like the studies described in the paragraph above, this second group of studies is also intended to generate empirical evidence to inform policy and practice, but, unlike the former, the intention of the latter group is to influence policy at the level of professional teacher education organizations and national/regional accreditors as well as the level of local policy developed and implemented at the institutions that prepare teachers.

To a certain extent, Genres 1 and 2, and some of the studies in Genre 3 have grown up and operate substantially separately from the studies in Genres 4, 5, and 6, and some of the studies in Genre 3. The former group focuses on the broad impact and implications of state and federal policies regarding teachers' certification, licensure, and entry pathways without attention to the actual teachers who live out those policies under varying conditions and in different contexts nor to the impact of school and other contexts on teachers' work lives. On the other hand, the latter group of studies focuses on teachers' learning in key teacher education and school contexts, but does not necessarily attend to the larger policy and political contexts. More cross-referencing of studies across genres could be valuable within the current political and policy context and could present a richer picture of the relationships between various aspects of teachers' education and the outcomes of these than any single genre can do.

ACCOUNTABILITY FOR WHAT?

One of the most interesting findings of this conceptual review was which outcomes were and were not investigated within and across the six genres. In terms of what counted as an outcome of teachers' education, there was again a divide between the studies in Genres 1 and 2 and some of the studies in Genre 3, on one hand, and some of the studies in Genre 3 and most of the studies in Genres 4, 5, and 6, on the other. This division can be understood in terms of basic questions about accountability in teacher education. Although there is now nearly universal consensus in the United States that there should be accountability for outcomes regarding teacher certification regulations, teacher education programs, and pathways into teaching, there is no clear consensus about what those outcomes should be.

The studies in Genres 1 and 2 and some of those in Genre 3 focused on outcomes such as students' test scores, distribution of teachers, and teacher retention/attrition. The assumption here is that teacher education programs/pathways and the regulatory apparatus regarding teacher preparation and certification should be more or less directly accountable for student outcomes and other aspects of teacher quality defined in terms of effectiveness. This is consistent with the assumption underlying the dominant discourse about teachers' education and teacher quality that students' learning must be the bottom line (Cochran-Smith & Fries, 2010). This means that teacher education programs, pathways, and certification requirements should be directly accountable for students' learning. This assumption is reflected in Race to the Top funding priorities and other initiatives that privilege states and school districts with data systems linking students' test score data to teacher data to teacher preparation/pathway data.

In contrast, some of the studies in Genre 3 and many of those in Genres 4, 5, and 6 examine teachers' career paths as well as how and why teachers do or do not implement the knowledge, skills, and dispositions emphasized in preparation programs once on the job, including teachers' efforts to be advocates for students and their families and/or to teach in accordance with a social justice perspective. These studies work from the assumption that teacher education programs and pathways should be held accountable for the commitments and skilled classroom performance of the teachers they prepare and for their willingness to stay on the job. The assumption here is that students learn more when they have committed teachers with more knowledge and skills who stay in teaching beyond the first few years. Although these are essential goals, it is important to note that this also means that the studies in Genres 4, 5, and 6 are generally not in sync with the current accountability regime and with the dominant teacher quality discourse wherein students' learning, usually defined in terms of test scores, is the bottom line.

We want to make a very clear point here that we are not suggesting that all studies of teacher education programs and all (or even most) studies of the on-the-job experiences of program graduates should make students' learning and test scores the outcome. Nor are we suggesting that teacher education programs should eschew their other commitments and purposes, such as preparing teachers to teach for social justice, democratic participation, or diversity. In fact, we ourselves have been staunch advocates of these greater goals for teacher education, and we have long been open critics of the current accountability regime wherein teacher quality is equated with students' academic achievement only, and students' achievement is equated with test score gains only (e.g.,

Cochran-Smith, 1991, 1999, 2005, 2006; Cochran-Smith, Gleeson, & Mitchell, 2010; Cochran-Smith & Power, 2010; Reagan, Pedulla, Cannady, Cochran-Smith, & Jong, 2011; Stevens & Piazza, 2010). What we are saying, however, is that it is not surprising that studies using qualitative research methods and very small samples, which focus on teachers' practices, beliefs, and longevity in the field, have been marginalized to a certain extent in the larger public discourse about teacher quality and teacher preparation, just as the discourses of professional teacher education and teacher education for social justice have been marginalized (Cochran-Smith & Fries, 2010).

THE VALUE OF A GENRE REVIEW

As we noted in the introduction to this article, there are multiple controversies at many levels about how teachers are and ought to be educated, recruited, and licensed. At the heart of many of these controversies are differing viewpoints about what the outcomes of various policies and practices related to teachers' education are likely to be as well as differing conclusions about what the existing empirical research has shown these to be. Although some disagreements are the result of different readings of the same research, many are the result of reading different research in the first place; that is, advocates of different policies and practices regarding teachers' education are often not familiar with or do not value the same kinds of research and thus selectively privilege but also selectively dismiss particular genres of research. This has significant consequences. Historically, the ways research questions have been posed about the outcomes of teachers' education have prefigured the answers (Cochran-Smith, 2001; Shulman, 1986). Similarly the ways policy problems regarding teacher quality are framed have delimited in the first place the boundaries and restrictions of policy solutions (Stone, 1997). Further, the strategies of persuasion and argumentation used by various actors, agencies, and stakeholders to support or undermine various approaches to teacher quality/teacher education—including what empirical research they draw on—have determined to a great extent the parameters of the debate (Fischer & Forester, 1993).

Our intention in this article has been to cross the usual borders between research genres, methodologies, and disciplines and to be as inclusive as possible of differing research paradigms and purposes. As we have shown, this approach produces an interdisciplinary field of studies with six research genres, each of which illuminates certain aspects of teachers' education and outcomes, while de-emphasizing or ignoring other aspects. Our final argument here is that all of these research

genres ought to be acknowledged and taken into account as part of the larger research terrain. All of these can be valuable to practitioners and policymakers with varying purposes. Crossing borders between and among research genres can lead to richer understandings about teachers' education and outcomes than we currently have.

What we are calling for here in terms of traversing the research terrain is akin to what Greene and Caracelli (1997) have called a "dialectic mixed methods inquiry" approach to mixed methods research generally. From their perspective on mixed methods research, different research designs and approaches are regarded as providing valuable, but always partial, perspectives on the topic under investigation, and the tensions created by studies' differing assumptions and ways of knowing are regarded as generative of richer understandings rather than as incompatible approaches. Applying this perspective to the politically controversial and "hot" topic we have taken up here—teachers' education and its outcomes—we are calling for recognition of the value of multiple genres of research even while locating that research in the context of the local, state, professional, and federal political and policy agendas it serves.

Acknowledgments

Notes

1.   This is not to suggest that teachers' education ends once they begin teaching. However, the point of this review was to examine the multiple ways researchers have examined the connections between teachers' preparation/certification status and postpreparation outcomes.

2.   Selected journals included *Econometrica, Education Policy, Teachers College Record, American Educational Research Journal, Teaching and Teacher Education, Educational Evaluation and Policy Analysis, Education Policy Analysis Archives, Journal of Teacher Education, Qualitative Studies in Education, Educational Studies: Journal of the American Educational Studies Association, Teacher Education Quarterly,* and *Journal of Political Economy.*

3.   In some cases, more than one research article was based on the same study; thus the exact number of studies is unclear.

4.   Outcomes studied in each genre are listed in descending order of frequency of occurrence.

5.   Clayton and Schoonmaker (2007) use qualitative methods to focus on entering teachers with GPAs above a B+ and use grounded theory to study how their growth as teachers is socially constructed and iterative.

6.   In a separate analysis that builds on this one, we elaborate and synthesize the findings of the studies in each genre (Cochran-Smith et al., 2011).

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