

REGIONAL EDUCATIONAL LABORATORY

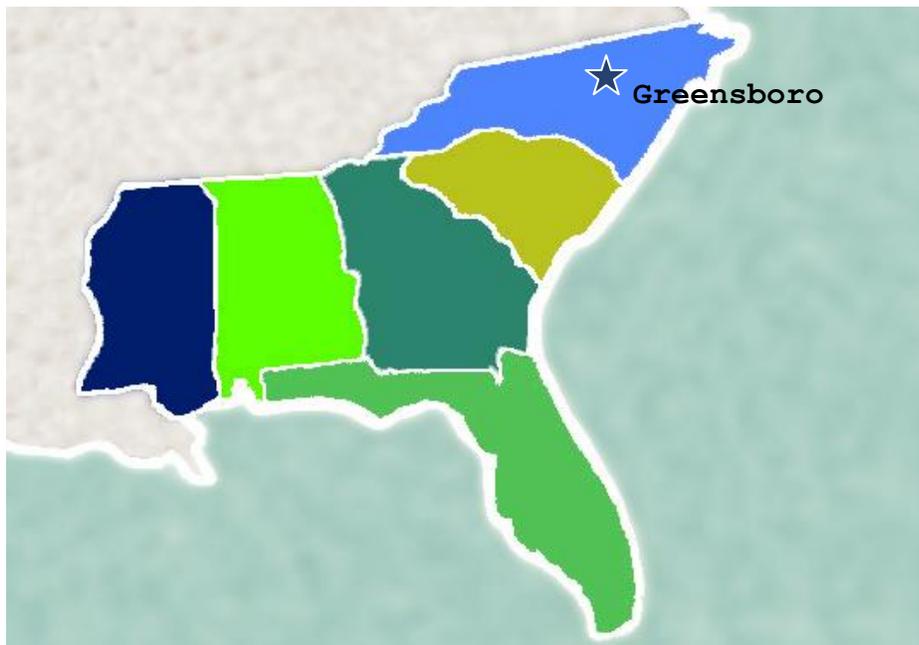
SOUTHEAST ~ SERVECenter

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EVIDENCE BASED EDUCATION REQUEST DESK

OUR GOAL

To assist educators and policymakers in their efforts to apply the evidence base to decisions about policies, programs, and practices they encounter.



REQUEST:

- What is the impact of teachers with alternative certification on student achievement in science and mathematics?

RESPONSE

This response looks specifically at the research related to teacher certification, alternative certification, and student achievement in science or mathematics. The research findings are inconclusive, and there is a need for more experimental and quasi-experimental studies to further define causality. Seftor and Mayer found similar results in their 2003 literature review, *The effects of alternative certification on student achievement*.

Since the 1980s, the most common solution to the teacher shortage in many states has been to create alternative certification programs in which the criteria for certification has varied widely. According to Dr. Feistritzer of the National Center for Alternative Certification (NCAC) (www.teach-now.org/Intro.cfm, 2008), “In 2007, all 50 states and the District of Columbia have at least some type of alternative route to teacher certification.” Furthermore, according to state data, approximately 59,000 individuals were issued teaching certificates via alternate routes in 2005–2006. The criteria for alternative certification and the degree of training and support of these alternatively certified teachers vary greatly from state to state and in the state of Florida, within districts. (Feistritzer, 2007)

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Two studies conducted using the 12th-grade sub-set of the National Educational Longitudinal Study of 1988 (NELS:88¹) data reached conflicting conclusions. Goldhaber and Brewer (2000) found that 12th-grade students of teachers who hold standard certification have statistically significant higher scores in mathematics than do similar students with teachers holding private school certification or those who are not certified in mathematics. They further report that 12th-grade mathematics and science students of teachers with emergency certification “do no worse than students whose teachers have standard teaching credentials” (129). Darling-Hammond, Berry, and Thoreson (2001) critiqued the methodologies used in the Goldhaber and Brewer study and closely examined subsets of the same data—NELS:88 math and science teachers with emergency and temporary certification. They found that “most of these teachers have qualifications resembling those of teachers with standard certification, and that those who have more teacher training appear to do better in producing student achievement” (57). Goldhaber and Brewer (2001) also critiqued the methodologies used by Darling-Hammond et al. (2001) and argued that their results were subject to the same limits largely due to the fact that there was no way to account for differences in teacher certification requirements across states, and therefore, no way to consistently define different types of certification (i.e., standard, alternative, not certified, certified but not in field, etc.).

Darling-Hammond (2000) also conducted another large-scale study examining teacher quality and student achievement using data from a 50-state policy survey, state case study analyses, 1993–1994 Schools and Staffing Surveys, and 1992–1996 National Assessment of Educational Progress (NAEP). She found that the quality of the teaching force is more strongly correlated to student achievement than are student demographic characteristics, class size, overall spending levels, or teacher salaries (p. 29). Furthermore, “measures of teacher preparations and certification are by far the strongest correlates of student achievement in reading and mathematics” (p.1). “Among variables assessing teacher ‘quality’, the percentage of teachers with full certification and a major in the field is a more powerful predictor of student achievement than teachers’ education levels (e.g. master’s degrees)” (p. 30). While the study is frequently cited in the literature, the study also suffers from a number of methodological constraints, namely, relying on unverified teacher self-report data, an inability to control for differences in certification requirements across states, and an inability to precisely match students and teachers.

In a later study (2005) using a large student-level 1995–2002 data set from Houston, Texas schools, Darling-Hammond, Holtzman, Gatlin, & Heilig found that “relative to teachers with standard certification, uncertified teachers and those in most other non-standard categories

¹ The NELS:88 study was funded by the U.S. Department of Education and collected data from a nationally representative sample of approximately 24,000 8th-grade students, their teachers, and their parents beginning in 1988. A sub-set of these same students were re-surveyed in 10th- (1990) and 12th-grade (1992).

generally had negative effects on student achievement, after controlling for student characteristics and prior achievement, as well as teacher experience and degrees” (p. 16). For fourth- and fifth-graders in this study, “Alternatively certified teachers had negative effects on achievement on three tests” (p. 17). These tests were TLI Math, SAT-9 Math, and SAT-9 Reading. However, similar to earlier work, Darling-Hammond and her colleagues were unable to overcome data and methodological constraints.

Although neither are quasi-experimental or experimental studies, two more recent studies have sought to produce better estimates of the relationship between certification and student achievement. Both used fixed effects estimations to control for the lack of random assignment of teachers and students into classrooms and schools. Clotfelter, Ladd, and Vigdor (2007) use panel data from North Carolina and find that having a regular license has a positive effect on student achievement in the elementary and middle school grades. However, Kane, Rockoff, and Staiger (2006) used New York City data from grades 3 through 8 and found that there is little, if any, relationship between uncertified and certified teachers and student mathematics achievement.

In a meta-analysis of 24 studies of teacher certification, Qu and Becker (2003) found that teachers trained in traditional and alternative routes were more effective than emergency (minimal) certified teachers. Alternative certification programs varied greatly and some were “equally effective in providing quality teachers” (p. 40). While the first meta-analysis of its kind, a number of teacher characteristics found to be significantly related to student achievement (teaching in-field, educational degree, certification exam scores, etc.) were not used as variables or controls in the meta-analysis.

Even though the goal of most alternative certification programs is to increase the number of teachers in shortage areas such as mathematics and science, SRI International’s 2001–2005 (Humphrey & Wechsler, n.d.; Humphrey, Wechsler, & Hough, 2008) study found very few (approximately 5%) participants switched careers from mathematics and science to teaching. The SRI International study looked closely at the characteristics of seven alternative certification programs. The SRI Study was not designed to collect data on student achievement; however, one of the seven programs studied, Teach For America, has been studied in separate research.

Decker, Mayer, & Glazerman (2004) compared student achievement of Teach For America teachers and other teachers (traditionally certified and non-AFT alternatively certified) in one elementary school. Students were randomly assigned to the teachers. They found that “TFA teachers had a positive impact on the math achievement of their students—average math scores were significantly higher among TFA students than among control students” (p. xiv). It should be noted, however, that TFA teachers had strong academic backgrounds; 70% had bachelor’s degrees from “most competitive” or “highly competitive” or “very competitive” colleges (p.

xiii). In addition, 25% of these TFA teachers had a bachelor's or master's degree in education by the end of the study year.

In one small-scale study (Gimbert, Cristol, & Sene, 2003) in Virginia of the Algebra I teachers in Transition to Teaching program and their students, “the results of the study afforded evidence that the students taught by first year, alternatively prepared teachers achieved as well as or better than their peers taught by traditionally certified teachers.” These TTT teachers participated in an intensive summer institute in which they studied curriculum and instruction methods, classroom management, behavior management, and Virginia Standards of Learning. In addition, they had mentors and content coaches who supported their teaching efforts.

In short, the research is best captured by a critique of the current research offered by Ballou and Podgursky (2000) in which they criticize policy recommendations of mandatory accreditation programs and certification because of the weak causal evidence provided by the literature. As they note, extant research has documented, for the most part, a relationship between some measured teacher characteristics and student achievement as measured on a standardized tests. Furthermore, all of the studies suffer from at least one methodological constraint (Ballou & Podgursky, 2000; Seftor & Mayer, 2003), such as being unable to precisely match students and teachers; using only a sub-set of available data with no logical rationale, including unverified teacher self-report data; and using inconsistent certification definitions, all of which can influence results. Thus, which characteristics are the most powerful predictors of student achievement, including type of certification, is still largely unknown.

Websites

Center for Teaching Quality (<http://www.teachingquality.org/index.php>) recently conducted research on an alternative teacher certification program, NC Teach, as a subcontractor for the Center for Education Policy at SRI International. Information about this program can be found on the website.

National Center for Education Information (<http://www.ncei.com/index.html>) contains information about teacher preparation and retention, and reflects the results of numerous national surveys of educators across the nation. In addition, there are several resources, reports, and useful links.

Multiple publications including

- Feistritzer, C. E., & Haar, C. K. (n.d.) Research on alternative routes: Education research. National Center for Alternative Certification.

National Center for Alternative Certification (<http://www.teach-now.org/Intro.cfm>) This site, founded by Dr. Emily Feistritzer in 2003, gives information on how to become a teacher in every state; it is a clearinghouse for information on alternative teacher certification.

SRI International (<http://policyweb.sri.com/cep/projects/displayProject.jsp?Nick=altcert>) recently conducted a three-year study of alternative certification programs. Information about this study and key reports can be found on this website.

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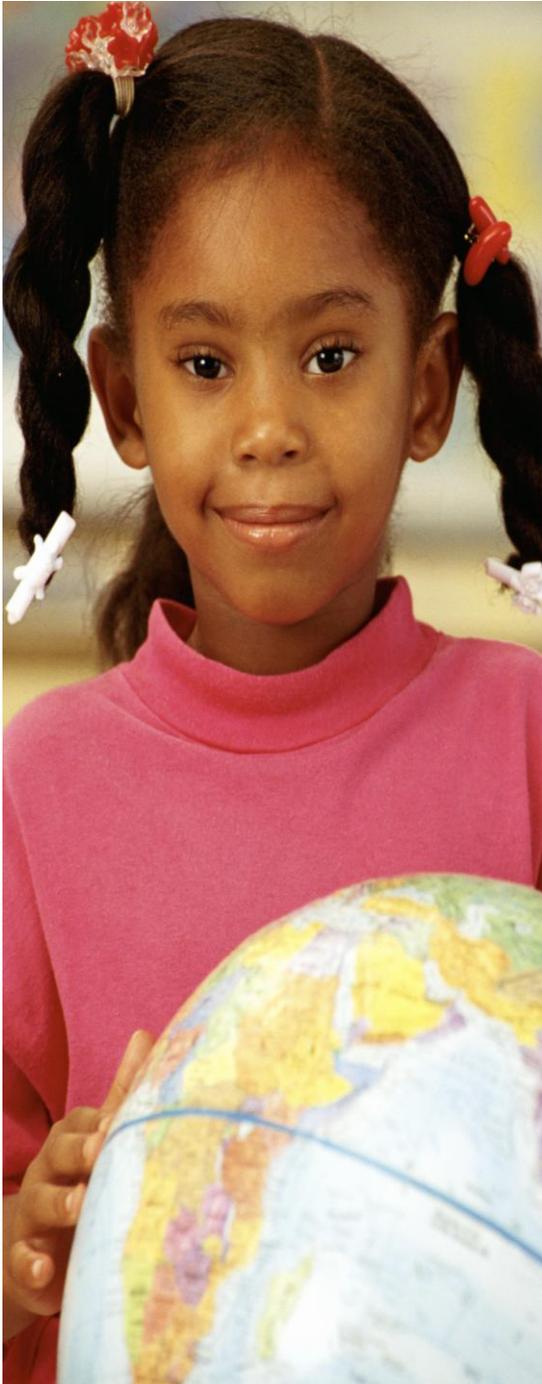
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Methodology

To answer this request, we searched for information in various online resources including WilsonWeb (UNCG Library), ERIC (UNCG Library), PsychINFO (UNCG Library), journals pertinent to the topic (UNCG Library), the U.S. Department of Education, and relevant education organizations such as American Institutes of Research and Mathematica. In the UNCG Library system search, we generally focused on the years from 2003 through the present, with the exception of three foundational articles in 2000 and 2001. The search terms included “alternative certification,” “teacher certification,” “student achievement,” “teacher effectiveness,” “mathematics,” and “science.”



We provide research based information on educational initiatives happening nationally and regionally. The EBE Request Desk is currently taking requests for:

- Research on a particular topic
- Information on the evidence base for curriculum interventions or professional development programs
- Information on large, sponsored research projects
- Information on southeastern state policies and programs

For more information or to make a request, contact:

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