

THE TEACHER PREPARATION ► TEACHER PRACTICES ► STUDENT OUTCOMES RELATIONSHIP IN SPECIAL EDUCATION: MISSING LINKS AND NEW CONNECTIONS



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The purpose of this paper is to examine the relationships between preservice teacher preparation, teacher in-service practice, and outcomes for students with special needs. A fuller understanding of the *teacher preparation > teacher practice > student outcomes* connection will inform teacher preparation programs as they work to better equip general and special education teachers with the knowledge and skills that will lead to improvements in student achievement. This exploration of the literature sheds light on these relationships but reveals a dearth of studies that would bring real illumination. Finally, specific recommendations to direct further development of policy, research, and practice—and the interactions between the three—are provided.

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INTRODUCTION

The evolution of educational policy during the last half century has been in some ways breathtakingly rapid. This sea change can be observed most notably in the way students with disabilities are thought about and educated in America's schools. Advocates for children with special needs once had to struggle to ensure that their students were simply given access to a free and appropriate public education. This national debate resulted in federal legislation that made states and schools accountable for providing school resources to these previously underserved children. Now, as in general education, policy has moved beyond the mere provision of resources (inputs) to the seeking out of results (outcomes). Two major pieces of federal legislation passed in the last half decade have codified this policy shift to base school accountability on student learning outcomes—including those children with special needs. Both the No Child Left Behind (NCLB) Act and the Individuals with Disabilities Education Improvement (IDEA) Act of 2004 require that states ensure that students with disabilities meet not only developmental goals, but also, “to the maximum extent possible, the challenging [academic] expectations that have been established for all children” (IDEA, 2004, p. 118, STAT. 2649).

Therefore, in order to ensure that children with special needs are able to achieve these high academic expectations, educational policymakers and teacher educators must refine, implement, and support strategies to better prepare teachers to work effectively with special-needs students. Moreover and importantly, it is not just special education teachers who require high-quality preparation in this important area but general education teachers as well. This is due to two parallel developments. First, as Congress and others have recognized, students identified as having special needs are more likely to be successful in the least restrictive school environments possible, which often means being included in regular education classrooms (Baker, Wang, & Walberg, 1994). Second, the population of students in need of special services is large: for one indication, slightly more than 8 percent of all U.S. students were served under IDEA in 1999–2000. Students with specific learning disabilities¹ number close to 3 million (U.S. Department of Education, 2002), most of whom start out in the general education classroom. These students require specialized knowledge and high-quality instructional practices from their teachers to recognize, address, and possibly divert referral to special education. Teachers are not born with this knowledge and skill, nor are they often bestowed with it in their teacher preparation programs. Moreover, schools are rarely equipped to train teachers in these techniques once on the job. Teacher preparation programs must therefore respond to this challenge by offering high-quality preparation to all teachers—both general and special education alike—in the diagnosis and instructional treatment of students with special educational needs.

This paper examines what is known, unknown, and unknowable in this tremendously important link between teacher preservice preparation, teaching practices, and the achievement of students with special needs. It highlights the need for greater knowledge of each link in the chain between teacher preparation and student outcomes, and how greater knowledge of one can inform understanding of another. The vital need to break down the artificial walls in the education of (and policymaking for) prospective teachers in general and special education also is discussed. Finally, examples and recommendations are provided.

¹ IDEA defines a specific learning disability to mean a disorder “in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations” (p. 118, STAT. 2657–2658).

TEACHER PREPARATION FOR STUDENT ACHIEVEMENT:

THE PROBLEM OF CAUSAL ATTRIBUTION

Valid, methodologically rigorous research that links the content and structure of teacher preparation programs to student outcomes is scant, inconclusive, and tends to be aggregated at a level that is not particularly useful (Wilson, Floden, & Ferrini-Mundy, 2001), especially in the area of special education (Brownell et al., 2005). There is no extant research that demonstrates that, say, University X produces more teachers whose special education students score above proficiency in mathematics than University Y, much less explores why. Nor are there studies that demonstrate that taking courses in educational psychology, for example, makes teachers more effective in producing high learning gains than not taking such courses.² There are many reasons for this, which are discussed later, but as always in the study of teacher effects, it is what teachers do in the classroom and the knowledge they bring to bear that produces student learning gains, not simply what and how much they know, the attitudes they hold, or what they learned in a methods class (although those things also are important). It is how they use that knowledge and how deftly they enact the practices they were taught that affects how high their students achieve. Many also note that the manner in which teachers encourage the children to succeed and how they interact with each child matters enormously to long-term academic success (e.g., Hamre & Pianta, 2005; Pedersen, Faucher, & Eaton, 1978). Thus, the effect of teacher preparation on eventual student outcomes is necessarily mediated by teachers' actual practice (which also is influenced by many factors in the real-school world, including induction, ongoing professional development, and mandated curricula). One may conclude from this that it is therefore impossible to know the effect of teacher preparation on student outcomes without fully understanding teaching practice.³

Therefore, in order to use evidence to improve preparation, policymakers and teacher educators need to know answers to the following questions:

- What practices should preparation programs teach to prospective general and special education teachers (to lead to high student outcomes)?
- What kinds of knowledge and dispositions do all teachers need to have in order to enact those practices well (to lead to high student outcomes)?
- How do preparation programs teach teachers to choose the best practices to use given the schools' context and their students' needs and modify them appropriately as the situation demands (to lead to high student outcomes)?
- What kinds of candidates should be recruited and selected into preparation programs that will be more likely to enact effective teaching practices (to lead to high student outcomes)?

These are all important questions—the answers to which are still being discovered. One study has attempted to quantitatively link general education preparation programs to student achievement but found a great deal of imprecision in the estimates of teachers' effects, with large standard errors making it difficult to interpret results (Noell, 2006). Thus, the relationship between which programs teachers attended and student outcomes is not convincingly demonstrated in the preliminary results.

Only one extant study was found that examines all three components of the *teacher preparation > teacher practices > student outcomes* in the area of special education (Miller, 1991). Unfortunately, this study left many of these questions unanswered, but it is worth reviewing because it demonstrated what it is possible to do. The author used a case-study approach to evaluate a project designed to facilitate the gradual integration of the special education and general English teacher preparation programs in one institution. Researchers evaluated the model in several stages, and participating teachers field-tested

practices they had learned in particular units. The videotaped field tests then were evaluated to determine whether the unit was taught well, whether the “target students” reached the instructional goals set for them (measured by pretest and posttests), and whether the teachers felt an increase in their sense of competency as a result of implementing these practices. After the evaluation of a unit was complete, the results of the evaluation were used to revise the unit to address inadequacies that had been identified. The study concluded that the approach used by the teacher preparation program to facilitate integration of special and general education resulted in positive outcomes for both teachers and their students. However, it is uncertain from this study if outcomes can be generalized to end-of-course tests of proficiency.

The next two sections briefly review the small (but growing) research base on the *teacher preparation > teaching practices > student outcomes* link for students with special needs and considers some of the reasons why this research base is not stronger. In addition, it describes why this research base is not as useful as it could be to inform best practice.

² See Wilson, Floden, & Ferrini-Mundy (2001) for a comprehensive review of the limited research on the value added by teacher education coursework.

³ Not so, say some statisticians. By way of example, a study demonstrated that taking more courses in high school leads to higher student achievement (variable $b > \text{variable } c$). Another study demonstrated that high school exit exams lead to more course taking among students (variable $a > \text{variable } b$). However, a third study demonstrated that high school exit exams do not lead to higher student achievement (variable $a \rightarrow \text{variable } c$). How could this be? One theory (yet to be empirically tested) is that students have to want to take more courses in order to gain the benefit—thus a confounding and otherwise hidden variable of student motivation interrupts the $a > b > c$ link, and so, some would argue, it is the lessons from that third study, $a > c$, that is the one that policymakers need attend. Still, in order to make well-warranted decisions about how to improve or change variable a (teacher prep) to get better variable c (student achievement) necessitates knowing more about variable b (practice).



THE RELATIONSHIP IN SPECIAL EDUCATION OF TEACHER PREPARATION TO TEACHING PRACTICE

A small number of studies examine how teacher preparation is translated into beginning teachers' practice. For one example, Grisham-Brown and Collins (2002) asked teachers taking courses in special education teaching methods⁴ to examine a list of practices and to indicate which ones they had used before the course, which ones they used after the course, how many students were affected, and how many other colleagues with whom they had shared practices and other course information. The researchers used a survey to gather information on specific teacher practices used, which they were able to relate to specific teacher preparation coursework. With 28 responses (21.7 percent) to their surveys, they concluded that more teachers were implementing these practices after the course and were sharing those practices with other adults. This study is a good example of how one might design research to examine the relationship between what teachers were being taught in a specific course and whether they had in fact used the practices they had learned in their classrooms. However, many researchers argue that self-report impact data are problematic evidence of real change.

A more recent study conducted in the general education arena examined how the type of teacher preparation program affected the quality of first-year teachers' teaching practices. Using a slightly modified Praxis III observation tool to measure the quality of new teachers' instructional practice, Good et al. (2006) studied teachers during a three-year period (63 teachers in the first year, 131 in the second year, and 139 in the third year) and found that teachers who were prepared at traditional undergraduate preparation programs were slightly better at classroom management compared to those who were prepared in a postbaccalaureate program at a university; however, all teachers prepared in these two settings met the criterion of "desirable and realistic first-year teaching practices" in each of the assessed domains: classroom management, assessment, and implementation of instruction. They found a nonsignificant but intriguing trend that those who graduated from a traditional program were a better fit with elementary and middle school classrooms, whereas those in the nontraditional postbaccalaureate pathway were a better fit with high schools. The authors suggest that the nontraditional match with high schools may reflect that their "subject matter background may compensate, if not obviate the need, for their less



developed knowledge of how to manage student motivation and learning” (p. 423). While their research is intriguing, it remains to be seen whether subsequent research will demonstrate similar findings regarding the differences among the appropriateness for high school versus middle school and elementary teaching positions for teachers prepared in traditional or nontraditional settings.

These studies scratch the surface of the needed research that could be conducted on how teacher preparation programs affect teachers’ practice. This is in part due to the fact that the measurement of both variables “a” (preparation) and “b” (practice) is complex, the tools to do it reliably and well are still being developed, and there is limited research support. A few of these problems are considered here.

MEASURING SPECIAL EDUCATION PREPARATION

First, teacher preparation programs are dynamic and varied and therefore a moving target. Making sweeping generalizations about the worth of traditional teacher education programs versus alternate route or no preparation at all is a popular activity among economists and advocates of alternate routes, but is not particularly useful in advancing knowledge of the field or making convincing conclusions about policy solutions to improve teacher quality through improved preparation.

Despite unanswered questions in the link between preparation and practice, teacher education has been changing to respond to the emphasis on educating students with special needs—be they educational, emotional, behavioral, or cultural—in ways that support their diverse needs (Kavale, 2005; Maheady, 1997; Pugach, 2005; Pugach & Seidl, 1995). In a number of teacher preparation programs, teacher candidates graduate with certifications in both special education and general education.⁵

In their report titled *Preparing Special Education Teachers*, Hardman, McDonnell, and Welch (1998) provide recommendations for moving toward preparation that involves:

- “(a) Collaboration and cross-disciplinary training.
- (b) A common core of knowledge and skills for both general and special education teachers.
- (c) Field-based training that involves building and sustaining partnerships between higher education and the public schools.” (p. 2)

The interpretation and application of these goals has been different for each teacher preparation program, however, as evidenced by the several different lists the authors provide (from such sources as ETS, the Joseph P. Kennedy Jr. Foundation, the U.S. Department of Education, and the University of Wisconsin–Milwaukee) describing what constitutes a “common core” of learning for programs preparing special education teachers. As Shulman (2005) argued:

There is so much variation among all [teacher preparation] programs in visions of good teaching, standards for admission, rigor of subject matter preparation, what is taught and learned, [...] and quality of evaluation that compared to any other academic profession, the sense of chaos is inescapable. The claim that there are “traditional programs” that can be contrasted with “alternative routes” is a myth. We have only alternative routes into teaching. (p. 7)

This situation was in part provoked by the conflicting demands of the policy environment (Sindelar & Rosenberg, 2000). Nevertheless, it is the differences in emphasis, philosophy, and structure that represent the variability among teacher education programs and practices that need to be explored and connected to student outcomes to determine which set of practices in what kinds of programs work best. This way, as Shulman (2005) argues, the profession can converge on a “small set of signature pedagogies” that exist in what Wineburg (2006) calls a “culture of evidence” in teacher preparation. If this “set of signature pedagogies” can be clearly defined and taught consistently, then the impact of these practices could be reliably measured.

While states have different standards for what special education teachers should know and be able to do, the national debate over such standards has resulted in a draft document published by the Council of Chief State School Officers that lists 10 principles to guide the discussion of appropriate standards for special education teachers (Interstate New Teacher Assessment and Support Consortium, 2001). With support from U.S. Department of Education Office of Special Education Programs, the task force consisting of general and special education teachers and teacher preparation program representatives from around the country made an important statement about the need for both general and special education teachers to be adequately prepared in the subjects they were teaching and to be prepared to work with special education students. The important point they made is that special education teachers are responsible for content, not just delivery. Thus, the practices special educators employ in their classrooms may be somewhat different from those used in general education classrooms, but the goal is the same: teaching students in the content areas.

MEASURING SPECIAL EDUCATION TEACHERS' PRACTICE

In a survey of college- and university-based teacher education programs that are members of the American Association of State Colleges and Universities, nearly all reported that they use some sort of measure of effective teaching before their students leave their programs⁶, typically in the form of faculty-developed rubrics and program standards from professional associations, surveys of

cooperating teachers, work samples or portfolios developed during methods courses or student teaching, and state certification tests (usually the Praxis I and II) (Wineburg, 2006). However, these measures are inconsistently aggregated to determine program effectiveness (never mind individual teacher effectiveness), and very few teacher preparation programs follow up with their students once they have left the program and have been teachers of record for a year or more. This survey, unfortunately, did not explore differences in ways effectiveness is measured for general versus special education preparation programs.

Further, as education researchers and their funders well know, the measurement of teaching practice is complex, expensive, and difficult to scale up. Valid and reliable tools to evaluate teaching practice for the purpose of assessing teacher preparation on a large scale are still being developed. There are many tools in existence to measure teaching practice: (1) observation protocols like the Praxis III, which is based on Carol Dwyer's research,⁷ (2) teacher portfolio assessments developed by the Interstate New Teacher Assessment and Support Consortium, the National Board of Professional Teaching Standards, and states such as Connecticut and California, and (3) teacher logs such as those developed by researchers in the Study of Instructional Improvement (see <http://www.sii.soe.umich.edu/>). However, none map directly back to preparation, nor are they yet specified enough to measure a teacher's fidelity of implementation of a particular practice or set of practices, especially in special education.

⁴ Technically, this could be considered teacher in-service rather than preparation. However, the focus was on providing general education teachers with coursework in special education. The basic design of the study could thus be useful to consider, since it also could apply to evaluating teachers' use of specific practices they had learned before they began teaching.

⁵ The book *Teacher Education in Transition* (Blanton, Griffin, Winn, & Pugach, 1997) is a good source of information on the details of teacher education programs at a number of different colleges.

⁶ The American Association of Colleges of Teacher Education also recommends assessing new teachers; see their "accountability statement" at http://www.aacte.org/Programs/Accreditation_Issues/accountabilitystmt.aspx

⁷ See Dwyer (1994) for details of the research underlying Praxis III.

ASSESSING THE PREPARATION-TO-PRACTICE LINK IN SPECIAL EDUCATION

As Miller (1991) and Good et al. (2006) indicated, once a researcher has determined some measures to use, it takes careful investigation to establish the effect of preparation on practice. In general, there are few mechanisms that would allow researchers or teacher educators to do this because teacher prep program graduates are rarely “tracked” much beyond their initial school placements. The reasons for this are many, as the American Association of State Colleges and Universities survey revealed. First, the time, money, and human resources needed to collect and manage observation or portfolio data from alumni are considerable and simply out of reach for many teacher preparation programs, particularly the smaller ones (Wineburg, 2006). Second, although ideally there would be some alignment between the practices that teachers learn in their preparation programs and those required by the school or district (in the form of mandated curricula or the norms of the school’s professional culture), preparation programs do not always collaborate with districts and schools on matters of curriculum. Therefore, teachers may be constrained from using what otherwise might be effective practices learned in preparation (or the opposite, thus masking deficiencies in teacher preparation).

The evidence that is available to assess the connection between preparation and practice may most readily be derived from new teacher induction programs that are developed in partnership with local colleges and universities. Streamlined preparation-to-induction models of early professional learning would allow for immediate feedback for program improvement (as well as perhaps higher quality teachers). Indeed, those institutions that are able to use state data in helping to assess their program graduates are in states that have statewide induction programs (such as California, Connecticut, Louisiana, Tennessee, and Texas). But even in these states, teachers are not necessarily tracked over time as they change teaching assignments, move to other towns, or leave the profession, meaning that concerted efforts would have to be made to ensure that such data are kept current.



THE RELATIONSHIP IN SPECIAL EDUCATION OF TEACHING PRACTICE TO STUDENT OUTCOMES

The field of special education is much further along in terms of knowing what particular instructional interventions succeed in producing developmental and academic gains than in the general education arena, but the success of these interventions as they are taught to prospective teachers and implemented in real classrooms for a variety of grade levels and subject areas is less well established. For example, although great strides have been made in researching and developing practices to prevent early reading failure, less is known about what teaching strategies in mathematics and science, for instance, will improve learning for students with disabilities.

One study of the practice-to-outcomes relationship in the special education arena was conducted more than two decades ago by Englert (1984). In that study, researchers examined teachers' direct instruction practices in special education settings. The Direct Instructional Observation System was used to code teachers' instructional practices. Student pretest and posttest scores were subsequently used to divide teachers into two effectiveness groups based on the difference in their students' scores. Statistical methods were used to compare the skills and strategies of the two groups. Englert found significant differences in what the two groups of teachers did in the classroom. She also found there were three variables in particular that made a significant contribution to the differences in outcomes: more effective teachers had higher occurrences of lesson objectives, concept examples, and error drills. This study is a particularly elegant example of mixed-methods research, in which the qualitative component (used to collect data on teacher behaviors in the classroom) informs and complements the quantitative component (used to collect pretest and posttest data from students and to analyze differences in two groups of teachers).

MEASURING OUTCOMES FOR STUDENTS WITH DISABILITIES

The best way to measure the academic achievement of students with special needs is continuously debated. There are difficult questions about the accuracy of standardized test scores for students with particular disabilities (McDonnell, McLaughlin, & Morison, 1997). Still as NCLB is currently written, students with disabilities are required to take standardized state tests (with "appropriate" accommodations) so that test scores can be used for school accountability purposes. Thus, test scores are the most frequently used vehicle for measuring student outcomes—what meaning and uses can be derived from such outcome measures, however, is still to be determined. Their usefulness for mapping back to teacher preparation also is hampered by the fact that standardized tests are not necessarily available for every subject area (so that the impact of a music or a history teacher, for example, on student test scores is not as often measured). Furthermore, students have not been routinely tested in every grade, though this is changing.

Deno, Fuchs, Marston, and Shin (2001) have suggested measuring special education student achievement in the classroom with curriculum-based measures (CBMs) rather than using achievement test scores as measures of these students' learning. CBMs are commonly used to measure reading ability (though they are sometimes used for mathematics as well), and there is a high correlation between CBMs measuring oral fluency and comprehension (Deno, 2003). Because CBMs appear to have high reliability and validity (based on the studies that have been done), are a relatively quick, easy, and inexpensive way to measure student progress, and are highly correlated with other indicators of student learning, they hold promise as an outcome measure that can be tied directly to specific teacher practices. It also should be noted that standardized tests could be

⁸ The Woodcock Johnson III permits comparison with a general population norm group.

considered CBMs if they are well aligned to the state standards and, in turn, the curricula that teachers implement are well aligned with the standards.

Another example of the various measures researchers use to assess outcomes for students with special needs are those used by Blackorby, Chorost, Garza, and Guzman (2005) in their study of special-needs students. They reported on a six-year study that provides useful information about the school engagement and academic performance of elementary and middle school students with disabilities through the Special Education Elementary Longitudinal Study. The chief advantage of this study is that it includes more than 11,000 students in a nationally representative sample, meaning that their findings are generalizable to students nationally. The study looks at the achievements of students with various disabilities. Rather than focusing solely on test scores, the outcome measures they use include the following:

- School engagement: attending school and being actively engaged in learning activities at school.
- Academic performance: gaining proficiency in reading, in mathematics, and in making progress in the curriculum.
- Social adjustment: exhibiting social skills, being socially integrated, and avoiding negative behavior.
- Independence: demonstrating skills that support emerging independence and assuming responsibilities at home.

Students' academic performance in reading and mathematics was assessed with measures (the Woodcock Johnson III assessment, administered in person by the researchers) that allow for comparisons with the general education population.⁸

ASSESSING THE PRACTICE-TO-OUTCOMES LINK IN SPECIAL EDUCATION

Even as early as the 1970s, researchers recognized the “profound” methodological challenges in understanding the link between what teachers do in the classroom and their effect on student learning. As Berliner wrote in 1976, “The heart of performance- and competency-based teacher education, evaluation, and accountability programs is the establishment of empirical relationships between teacher behavior as an independent variable and student achievement as a dependent variable. But before researchers can adequately establish those relationships, they need to deal with the problems of instrumentation, methodology, and statistics” (p. 12). Although great advances have been made during the last quarter century, these problems have yet to be fully resolved.

In a study of whether changes in instructional practice in a general education secondary mathematics classes could affect student achievement test scores, researchers' findings were mixed: the changes in practice made a difference in students' scores only when such changes were accompanied by changes in the curriculum (McCaffrey, Hamilton, Stecher, Klein, Bugliari, & Robyn, 2001). This suggests that for some classroom practices, the impact on student learning is weak unless the practices are specifically designed to support particular curricular goals. Thus, simply introducing “new” practices into a classroom will not necessarily impact student learning in ways that can be measured by a standardized test.

Another problem in attributing teachers' practice to student outcomes in special education is that in high-quality schools, more than one teacher is attempting to improve those outcomes in any particular subject area. Response to Intervention is an interesting example of this measurement complexity. It involves having a student with

academic delays pulled out of the general education classroom and given one or more intensive research-validated interventions, usually by a specialist. Failure to “respond to intervention” can then be viewed as evidence of an underlying learning disability and the child is given an individualized education program. However, if the child does respond and academic gains are made, he or she is returned to general education and both the special educator and general education teacher continue to work intensively with the student. To whom should the improvement in outcomes as measured, for instance, by an end-of-year assessment be attributed? And were those gains in learning a result of both teachers’ initial training? If yes, which seems logical, how does a researcher tease apart which teacher influenced the students’ learning and to what degree?

As pointed out earlier in this brief, teacher practice often is constrained or supported depending on the classroom and school context. Isolating the effects of teacher behavior from the effects of peers, school resources, and classroom materials make determining the practice-to-outcomes relationship extremely difficult. Randomized controlled trials of particular practices would certainly help sort out these problems of context, but these are difficult and expensive to undertake and need to be done on a much larger scale than what has already been

attempted. However, they are necessary if the field is serious about better understanding this relationship. A quick skim of the research on the effect of teachers (versus teaching practices) on student outcomes affirms that much remains to be done to refine and define measures of teacher effectiveness (e.g., Goldhaber, 2003; Kirby, McCaffrey, Lockwood, McCombs, Naftel, & Barney, 2002; Kupermintz, 2003) as distinct from teachers’ preparation experiences or practice.

One interesting way this teacher effectiveness research is being conducted is through the use of value-added models or quantitative evaluations of the contribution that a teacher makes to student achievement test scores. In a study currently being conducted by The Education Trust (H. Peske, personal communication, October 17, 2006), researchers sampled a group of teachers who were ranked using their value-added scores. The double-blind study then sent researchers into these classrooms to observe teachers’ practice without knowing whether the teachers they observed were on the high or low end of the value-added ranking. The researchers are investigating the kinds of practices teachers enact to determine the kinds of actions that improve student achievement scores,



then triangulating their observations of teachers' instructional practice with teacher surveys, interviews, and instructional materials. This type of research holds great promise for understanding the teacher practices-to-outcomes relationship. If researchers are then able to link what effective teachers are doing back to what they learned in their teacher preparation programs in a valid way, then this technique can be useful for accountability and program improvement purposes.

ASSESSING THE PRACTICE ► OUTCOMES ► PREPARATION LINK IN SPECIAL EDUCATION

Researchers Cook, Landrum, Tankersley, and Kauffman (2003), who are studying special education teaching practices, have asserted:

As a field we have been particularly unsuccessful at abating the discrepancy between research and practice on a broad scale. Although there are individual success stories, [...]it appears that we are no closer to systematically adopting the use of effective practices than in the past. In fact, [...]there may even be an inverse relationship between the effectiveness of a practice and its level of implementation. (p. 346)

The authors suggest that taking what researchers have learned about the practice-to-outcomes relationship and using it in the preparation of teachers has not taken place in an optimal way. Part of the responsibility may lie with teacher preparation programs, particularly with teacher educators who, they argue, are not highly skilled, critical consumers of the research base and often allow their "personal preferences and experience" to guide the content and form of their pedagogy. A recent report from the National Council on Teacher Quality found some support for their conclusion, reporting that only 11 of the 72 institutions of higher education programs they sampled discussed the research on early reading interventions either in the syllabi or texts of their elementary teacher education preparation courses (Walsh, Glaser, & Wilcox, 2006).

Debates about the onus of responsibility for this state of affairs continue, but it is clear that more and better evidence needs not only to be developed but also shared. In the American Association of State Colleges and Universities survey, only 10 percent of the 240 institutions surveyed reported that they used some sort of PK–12 student test data to assess the effectiveness of their graduates (Wineburg, 2006), much less use them to inform their practice. They reported this was due in part to the great difficulty in collecting and managing the vast amount of data necessary to make well-warranted decisions about how best to prepare teachers. Is it in specific practices? Or should prep programs teach teachers to be savvy and knowledgeable consumers of the practices they will be asked to implement? Some of the reasons they point to are (1) the sheer volume of data necessary or demanded for various purposes exceeds current capacity of the systems in place, (2) the reluctance of districts and states to release the data because of privacy concerns or punitive scrutiny, (3) the lack of database capacity within and across institutions, and (4) differing definitions of particular variables.



RECOMMENDATIONS FOR POLICY, PRACTICE, AND RESEARCH

Unfortunately, more remains unknown than known in the links between *teacher preparation > teaching practice > student achievement outcomes*, particularly in the arena of special education. On the other hand, with improved tools, dedicated energy, a commitment to funding research, and methodological advancements, much less is unknowable than many perhaps thought. As Kimmelman (2006) argues, the acquisition, management, and implementation of knowledge is the heart of building capacity in the educational enterprise. To deepen our knowledge and bring it to bear, policymakers at all levels need to support researchers in conducting more rigorous (and generally more costly) research, and researchers need to communicate their findings with all potential stakeholders. Members of the American Educational Research Association panel on teacher education, which spent five years investigating this research base, wrote:

In particular, we need more and better research on the outcomes of teacher education, including research that uncouples the impact of preparation from that of teachers' entering characteristics. We need research that explores the interrelationships of teacher education strategies and arrangements, what teacher candidates actually learn, how they use what they learn in schools and classrooms, and what and how much their students learn. We need to know how these relationships vary within differing school and accountability contexts and conditions. In addition, we need research on the outcomes of preparing teachers in subject areas and grade levels besides secondary mathematics as well as research on preparing teachers for diverse populations, English language learners, and students with special needs. We need research on the effectiveness of the teacher education accountability mechanisms that are in place in nearly every state. We also need research on the impact on students' achievement of teacher retention and distribution patterns, low numbers of minority teachers, and differing pathways into teaching. (Cochran-Smith & Zeichner, 2005, p. 6)

Without this knowledge, any attempt to improve the quality and effectiveness of general and special education teachers through improved preparation is left to chance.



Nevertheless, the field of education and, more importantly, children with disabilities cannot wait until the necessary knowledge is available and well disseminated, and elegant data systems are developed before making a thoughtful attempt at improving preparation for all teachers no matter the pathway. Indeed the changing realities of modern classrooms demand that reforms are made in teacher preparation before all the “returns are in.” For example, Blanton, Blanton, and Cross (1994) found that what general and special education teachers do in their classrooms is different—how they make instructional decisions is different—to the extent they share the same students it is likely they have much to learn from one another. Therefore it makes sense—although the data are lacking to prove—that teacher education programs should help their students learn productive collaboration techniques, beginning with a common and inclusive language in order to exact improved achievement for all students, including those with disabilities.

The following five recommendations are offered based on the foregoing analysis to the education community at large, not simply to those charged with improving the preparation of special educators. The improvement in outcomes for students with disabilities will take a systemwide effort.

Recommendation 1

Comprehensive data collection, management, and analysis systems should be built to enable researchers to link specific preservice coursework to specific teacher practices to student learning outcomes. These systems should serve both accountability and program improvement purposes for the education of both general and special education teachers. This is in line with the recommendations of the American Educational Research Association panel that also determined building such a data system will require developing partnerships with preparation institutions, school districts, and state offices. This involves the identification and use of consistent definitions of terms, common outcomes measures, common research instruments for measuring learning and

performance, and the development of reliable data sets and resources.

Recommendation 2

In any decision about teacher preparation curricula, materials, or faculty, the end goal of effecting high achievement among all students, including special education students, should be kept in mind. Furthermore, it is important to use multiple measures of student outcomes for the evaluation and improvement of both preparation and practice.

Recommendation 3

Preparation programs should be encouraged to provide instruction in evidence-based special education practices for general education teachers, including explicit instruction and practice in effective collaboration among special and general education teachers. This entails providing high-quality, ongoing professional development for teacher education faculty to stay current with the growing research base on effective instructional practices.

Recommendation 4

In order to map its link to practice, research on the early career learning of general and special education teachers should extend from preparation into induction and other early professional development experiences.

Recommendation 5

Conversations should be promoted about the essential link between *preparation > practice > student outcomes* for students with special needs among policymakers, researchers, special educators, general educators, teacher educators, and school leaders who recruit, hire, assign, evaluate, and train (or in some cases retrain) teachers. Such conversations would promote not only improved knowledge sharing and mutual understanding but the development of even greater capacity for the improvement in the education of students with special needs.



EXAMPLES OF PROMISING PROGRAMS TO ASSESS THE PREPARATION ► PRACTICE ► OUTCOMES LINK

- **The Teacher Quality Project in Ohio.** Researchers from measurement, psychology, literacy, and teacher education are using both value-added assessment and qualitative studies to try to sort out the relationships of variations in teacher preparation, classroom discourse and instructional practices, and pupils' learning (<http://www.teacherqualitypartnership.org/>).
- **New York Pathways Project.** Labor market economists, teacher educators, and policy analysts have teamed up to examine teachers' entry paths, knowledge and skill, and student outcomes (<http://www.teacherpolicyresearch.org/>).

- **Louisiana's Teacher Quality Initiative.** The state is working to measure pupils' growth in achievement and link that to information about where and how candidates were prepared (<http://asa.regents.state.la.us/TE>).
- **The Carnegie Corporation's Teachers for a New Era Project.** Researchers from a variety of fields are working together on new ways to assess the impact of teacher education and to use that information for program improvement (<http://www.teachersforanewera.org/>).

It is important to note that no state-level or multischool programs were found that involve the preparation of special educators specifically.



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ABOUT NCCTQ

The National Comprehensive Center for Teacher Quality (NCCTQ) was launched on October 2, 2005, after Learning Point Associates and its partners—Education Commission of the States, ETS, and Vanderbilt University—entered into a five-year cooperative agreement with the U.S. Department of Education to operate the teacher quality content center.

NCCTQ is a part of the U.S. Department of Education's Comprehensive Centers program, which includes 16 regional comprehensive assistance centers that provide technical assistance to states within a specified boundary and five content centers that provide expert assistance to benefit states and districts nationwide on key issues related to the goals of the No Child Left Behind Act.

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