

Critical Features of Special Education Teacher Preparation:

A Comparison With General Teacher Education

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Policy and program decisions involve choices among different ways of preparing teachers. These choices are shrouded in increasingly contentious debates as teacher shortages reach crisis proportions. Yet, research on special education teacher education is almost nonexistent. Findings from comparative research documenting the characteristics of effective teacher education programs can inform these choices, but these findings should be grounded in what we know from previous research in general teacher education. To assist educators, we have analyzed literature in general and special teacher education toward two ends. First, we present a framework, derived from work in general education, for analyzing teacher education programs. Second, we use this framework to analyze practice in teacher education in special education. Specifically, we conducted an exhaustive review of special education program descriptions and evaluations. We conclude by describing steps necessary to improve the special education teacher education research base.

Chronic teacher shortages in special education, as well as concerns about a dwindling teacher workforce in general, have led to a variety of alternative routes to the classroom. The nature of these alternative routes is largely unknown, as is their capacity for ensuring that qualified special education teachers are available to serve students with disabilities (Rosenberg & Sindelar, 2001). Moreover, the development of alternative routes comes at a time when teacher education is under fire for its perceived inability to prepare quality teachers.

Critics argue that teacher education programs make no contribution to K-12 student achievement, are not intellectually challenging, and act as deterrents to bright, young people interested in entering the classroom (Finn & Kanström, 2000; Walsh, 2001). The federal government recently lent considerable credence to this position. Specifically, the U.S. Secretary of Education, in a highly controversial report (U.S. Department of Education, 2002), claimed that a teacher's verbal ability and subject matter knowledge are key factors in improving student achievement, whereas the role of teacher education is questionable.

Teacher education advocates counter that positive correlations exist between teacher certification status and student achievement (Darling-Hammond, 1999, 2000; Felter, 1999; Laczko-Kerr & Berliner, 2002). For example, Darling-Hammond (1999) reported that states with the highest proportions of certified teachers tended to have the highest National Assessment of Educational Progress scores. Additionally, in

a study controlling for student socioeconomic status and school characteristics, Laczko-Kerr and Berliner found that students taught by certified teachers performed significantly better on standardized tests of reading and language arts (but not mathematics) than those taught by undercertified teachers.

Parallel to the debate about certification and teacher quality, a spate of national reform reports have targeted teacher education since the mid-1980s. These include such reports as *A Nation at Risk* (National Commission on Excellence in Education, 1983), *A Nation Prepared* (Carnegie Task Force on Teaching as a Profession, 1986), *Tomorrow's Schools of Education* (Holmes Group, 1995), *A Call for Change in Teacher Education* (National Commission on Excellence in Teacher Education, 1985), and *What Matters Most: Teaching and America's Future* (National Commission on Teaching and America's Future, 1996). Although the recommendations vary, each report focused on the importance of a high-quality teaching force and on the quality of teacher preparation. Valli and Renert-Ariev's (2000) review of nine of these reports found the strongest consensus for the importance of disciplinary preparation (content) and multicultural emphasis. They also found strong consensus for (a) the use of authentic (i.e., field-based) pedagogy; (b) the existence of a clear programmatic vision; (c) a programmatic emphasis on learning and development, curriculum and assessment, and reflection and inquiry; and (d) the use of performance assessment. Moreover, the reviewers found a consensus (but less support) for emphasis on stu-

dents with special needs, collaboration, and technology and for the use of professional development schools.

Although the reform reports accept the premise that teacher education makes a difference, the national debate continues because we lack definitive studies about the impact of teacher education on student achievement. Studies demonstrate that teachers with pedagogical and content preparation are better able to engage students in the learning process (Kennedy, 1999; Wilson, Floden, & Ferrini-Mundy, 2001), but data generated in most studies are limited to small samples, single institutions, and, often, single courses or programs within an institution (Wilson et al., 2001). Thus, making generalizations about the features of effective teacher education courses or programs is difficult.

Despite these limitations, a comprehensive review of the research on learning to teach and a large-scale study of preservice and alternative certification reinforce some of the national reform reports' recommendations (National Center for Research on Teacher Learning [NCRTL], 1991; Wideen, Mayer-Smith, & Moon, 1998). In a review of 97 studies on learning to teach, Wideen et al. found four common features in programs that produced conceptual change in preservice students: (a) the use of a pedagogy that helps preservice students examine their beliefs, (b) a strong programmatic vision that fosters program cohesion, (c) a small program size with a high degree of faculty–student collaboration, and (d) carefully constructed field experiences in which university and school faculty collaborate extensively. Similarly, NCRTL found that teacher education programs that make a difference in teachers' beliefs (albeit small) were characterized by a coherent programmatic vision, embraced a more constructivist orientation to teaching, and created opportunities to apply course-based knowledge to the classroom. Although these studies demonstrate that teacher education programs can change teachers' beliefs, we need cross-institutional studies that delineate the features of effective programs and document impact on preservice students' conceptions of teaching, classroom practices, and the achievement of children to determine whether a change in beliefs influences classroom practice (Wilson et al., 2001).

More recently, two large-scale studies of teacher education in general education have provided additional information about important program features. These studies, funded by the Association of American Colleges of Teacher Education (AACTE) and the International Reading Association (IRA), included 15 institutions that varied dramatically in terms of context. The findings of these studies support many of the recommendations from the national reform agendas and are consistent with the findings from the studies by Wideen et al. (1998) and NCRTL (1991). The AACTE and IRA studies are discussed in more depth later in this article.

In special education, however, we have no similar conceptual or research base. This situation is especially problematic given the emergence of multiple, alternative paths to the classroom (Rosenberg & Sindelar, 2001). Thus, the purpose

of this article is twofold. First, we present a framework for analyzing teacher education programs. Second, we use this framework to analyze practice in teacher education in special education. Specifically, we conducted an exhaustive review of special education program descriptions and evaluations. We conclude by describing steps necessary to improve the special education teacher education research base.

Framework for Defining Effective Practices in Teacher Education

The conceptual framework described in this section includes features that characterize 15 teacher education programs nominated as exemplary by other teacher educators, school-based professionals, and graduates of the programs. The AACTE study involved seven institutions, including graduate, 5-year, and undergraduate programs (Darling-Hammond, 2000). To identify crucial program features across the seven contexts, external researchers used qualitative methodologies that varied from one institution to the next. The researchers gathered extensive information about the individual programs and employed qualitative or quantitative methodology for collecting information about participating students or program graduates. The IRA study involved eight institutions selected by a panel of experts for their excellent undergraduate programs in reading education (Koppich, 2000; National Commission on Excellence in Elementary Teacher Preparation for Reading Instruction [NCEETPRI], 2003). Faculty from each program outlined the features that contributed to its overall effectiveness and described how those features were integrated in the program. Researchers determined common features, conducted interviews with graduates, and compared graduates of the reading programs to graduates from the same institutions' elementary education programs. Across the two studies, seven common features of effective teacher education programs emerged.

- A *coherent program vision* permeates all coursework and field experiences. This vision provides faculty with a common language for communicating with each other, students, and school-based personnel.
- The *conscious blending of theory, disciplinary knowledge, subject-specific pedagogical knowledge and practice* helps students link the knowledge they acquire in coursework to their classroom practice. Faculty accomplish this goal by modeling active pedagogy, spending considerable time discussing important readings, and providing students with numerous opportunities to practice and reflect on what they learn and practice in applied settings.
- *Carefully crafted field experiences* are extensive, integrated well with coursework, developmental

in nature, and supervised carefully. Furthermore, the classrooms where students intern are selected on the basis of the skills of the cooperating teachers, who collaborate with university faculty members to help students practice what they learn in coursework.

- Faculty establish and monitor the accomplishments of *standards for quality teaching*. Strategies range from high admissions standards to stringent exit criteria based on classroom performance. Many institutions, especially those based in urban environments, attempt to balance quality with equity of opportunity by using multiple admission criteria and ongoing mechanisms for monitoring and supporting student progress.
- Faculty use *active pedagogy* that employs modeling, helps students connect theory and practice, and promotes student reflection to help students move beyond their initial, sometimes simplistic, views of teaching and learning.
- The programs *focus on meeting the needs of a diverse student population* by attending to issues of diversity in required courses, assignments, and field experiences with students from diverse cultures and, in some instances, with students with disabilities.
- Faculty view *collaboration as a vehicle for building professional community*. Collaborations bridge preservice teachers, cooperating teachers, liberal arts and sciences faculty, and college of education faculty. Furthermore, some programs stress the importance of building community in the classroom by using a cohort structure.

In summary, the AACTE and IRA studies provide in-depth information about the specific features of teacher education programs that exemplify excellence. Moreover, the identified program features support the conclusions of a review of research on programs from single institutions (Wideen et al., 1998), the recommendations of the national reform reports, and some of the findings generated by the NCRTL (1991). What is missing from the AACTE, NCRTL, and Wideen et al. reviews is a strong link between program features, actual classroom practices, and student performance. Only the IRA study included this link, and the initial analyses suggest that graduates from exemplary reading programs differ from graduates of comparison programs on several specific dimensions:

1. The reading program graduates view their preparation as more useful to their current teaching assignments and are more confident in their abilities.
2. They are perceived more favorably by their principals and supervisors.
3. They use a greater quality, variety, and quantity of children's narrative and expository texts in their classrooms.
4. They are capable of more actively engaging students in literacy instruction.
5. They achieve better student gains on reading comprehension measures (NCEETPRI, 2003). Although the limitations of these studies are evident, the findings provide a starting point for analyzing the literature on teacher education for special education.

Method

Special education teacher education is not a well-established area of inquiry, and we found no solid syntheses of available programs or the features exemplifying those programs. For this review, we included literature if the manuscript was published within the past 13 years and described any special education personnel preparation program or program within a program. Alternative and traditional programs at both the undergraduate and graduate level were included.

Strategies

Several strategies were used to locate relevant literature. First, we entered keywords into the ERIC, PROQUEST, and Psyc-Info databases. Keywords included combinations of the following: *research, teacher education, special education, effectiveness, preservice preparation, policy, program evaluations, program descriptions, and exemplary teacher education*. We then conducted a search of the Library of Congress using the following keywords: *teacher education, teacher preparation, and preservice preparation*.

Second, we conducted hand searches of five refereed journals in teacher education: *Journal of Teacher Education, Teaching and Teacher Education, Teacher Education and Special Education, Action in Teacher Education, and Teacher Education Quarterly*. We limited our search to program descriptions and evaluations in special education published from 1990 to 2003. We assumed that publications in this time period would reflect best practice in special education teacher education. Finally, after collecting articles, ancestral citations were identified. Eighty-three publications were gathered, and 64 were reviewed. Nineteen publications with insufficient information were discarded. Programs not included were published in both ERIC documents and peer-reviewed journals. The nature of program descriptions did not vary in any systematic way by publication source. Of the reviewed programs, 22 were published in ERIC, 32 were published in peer-reviewed journals, and 10 were published in a book about unified teacher education.

Determining Common Features of Special Education Programs

We reviewed programs across different types of institutional contexts to determine common features. Forty-four programs were situated in research institutions and 20 were not. Additionally, 27 (42%) of the programs were funded by the U.S. Department of Education, Office of Special Education Programs (OSEP); 37 (58%) were not. The majority of programs were special education programs ($n = 38$); 26 (41%) programs were unified or dual certification programs.

To identify program characteristics, one researcher read all program descriptions and made a list of every program feature described. During this phase of the research, we analyzed the special education literature for evidence of the characteristics identified in our framework for exemplary teacher education programs (e.g., use of student cohorts). We also added characteristics that emerged as unique to special education teacher education (e.g., focus on inclusion, strong emphasis on research-based practice). After the initial list of features was complete, two researchers examined articles to ensure that these features were present and to verify the count of programs that included each feature. Interrater agreement was calculated by summing the total number of agreements and dividing it by the total number of potential agreements. These two raters achieved 83% agreement. All points of disagreement were then discussed and consensus was reached about how to assign features.

In the following section, we present the program features commonly described in the special education literature, with one important caveat: The articles for this research were written for a variety of purposes. Thus, authors may have omitted some relevant descriptive information about programs.

Results

In our review, the following program characteristics were identified. These characteristics occurred frequently enough to assume that many special education faculty believe they are important features of teacher education. These program characteristics include extensive field experiences, collaboration, and program evaluation, although the ways in which programs incorporated these components varied. Furthermore, many programs emphasized inclusion and cultural diversity. Moreover, special education programs in teacher education were diverse in terms of their program philosophies.

Crafting Extensive Field Experiences

In 54 (84%) of the reported programs, faculty described extensive field experiences that were well crafted, carefully supervised, and tied to practices acquired in coursework (Bay & Lopez-Reyna, 1997; Benner & Judge, 2000; Browning & Dunn, 1994; May, Miller-Jacobs, & Zide, 1989). Preservice

programs with the most intensive field components (e.g., Bay & Lopez-Reyna, 1997; Epanchin & Wooley-Brown, 1993; Keefe, Rossi, de Valenzuela, & Howarth, 2000; Lovingfoss, Molloy, Harris, & Graham, 2001) required early field experiences, one to two practicum experiences, and a semester or yearlong student teaching placement. In addition to describing extensive field experiences, authors mentioned careful supervision and assessment as important characteristics of their programs (Burstein & Sears, 1998; Langone, Langone, & McLaughlin, 1991; Ludlow, 1994; Rosenberg & Rock, 1994; Ruhl & Hall, 2002).

Programs varied in how knowledge and skills acquired in coursework were integrated with field experiences. Some programs required students to implement course-based assessment and instructional activities in the classroom (e.g., Fox & Capone, 1993; Ludlow, 1994; Miller, Wienke, & Friedland, 1999; Rosenberg & Rock, 1994; Russell, Williams, & Gold, 1992). Other programs attended to integration across courses by teaching courses in integrated blocks, using weekly seminars, or both. Furthermore, many programs used case-based approaches, portfolios, and weekly seminars to help students reflect on their learning across courses and practicum experiences (Affleck & Lowenbraun, 1995; Bay & Lopez-Reyna, 1997; Burstein & Sears, 1998; Emond, 1995; Epanchin & Wooley-Brown, 1993; Lovingfoss et al., 2001; May et al., 1989; Otis-Wilborn & Winn, 2000; Sobel, French, & Filbin, 1998).

Working Together

All program descriptions emphasized collaboration. They differed, however, in the ways in which they emphasized collaboration: (a) knowledge of collaborative skills, (b) faculty-to-faculty collaboration, (c) school-to-faculty collaboration, (d) use of student cohorts, or (e) some combination of these. Forty-six (72%) of the authors described course content focused on collaborative and consultative skills for working with other professionals and families (Bay & Lopez-Reyna, 1997; Browning & Dunn, 1994; Kemple, Hartle, Correa, & Fox, 1994; Lovingfoss et al., 2001); however, they rarely mentioned the pedagogy used to develop these skills. Exceptions included one program that explicitly mentioned faculty modeling as a way to teach collaboration skills (Keefe et al., 2000) and two others that described the use of projects to help students apply collaborative skills with other students or professionals (Dieker & Berg, 2002; Grisham-Brown, Collins, & Baird, 2000).

Faculty collaboration was a component of 45 (70%) of the program descriptions (Keefe et al., 2000; Kemple et al., 1994; May et al., 1989; Sobel et al., 1998); however, in many cases, authors did not describe the nature of the collaboration. In some programs, faculty described collaborative program planning activities (Bay & Lopez-Reyna, 1997). In other programs, faculty collaboration extended beyond planning to include co-teaching and collaborative monitoring of student

progress. Faculty collaboration even occurred across universities to deliver special or alternative certification programs (Dieker & Berg, 2002; Snell, Martin, & Orelove, 1997).

Collaboration with schools was mentioned in 47 (73%) of the program descriptions. Partnerships sometimes employed a professional development school model; in other cases, individual teachers across a district or districts were selected to work with students because of the teacher's expertise (Emond, 1995; Kozleski, Sands, & French 1993; Rude, Dickinson, & Weiser, 1998; Savelsbergh, 1995). In the most sophisticated instances of collaboration, entire school faculties, and sometimes school district personnel, collaborated around the following activities: (a) planning the teacher education program, (b) identifying quality placements for teacher education students, (c) selecting students for the program, (d) mentoring students, (e) evaluating students' progress in the classroom, (f) co-teaching courses in the teacher education program, and (g) participating in training to become a mentor teacher (e.g., Affleck & Lowenbraum, 1995; Andrews, Miller, Evans, & Smith, 2003; Emond, 1995; Hall, Reed, & McSwine, 1997; King-Sears, Rosenberg, Ray, & Fagen, 1992; May et al., 1989). Clear examples of programs that demonstrate most of these features can be found at the University of South Florida (Epanchin & Wooley-Brown, 1993) and at Johns Hopkins University (King-Sears et al., 1992). Teacher educators described using student cohorts to foster collaboration in 33 cases (52%) (Burstein, Cabello, & Hamann, 1993; Corbett, Kilgore, & Sindelar, 1998; Gettys et al., 2000; Lesar, Benner, Habel, & Coleman, 1997), and cohorts were more commonly found in programs located within teacher education institutions and in those that were not receiving OSEP funding.

Evaluating the Impact of Teacher Education Programs

Fifty-two (81%) of the program descriptions described how personnel collected information for evaluating the quality of the students, the effectiveness of the program, or both. Evaluation methods, however, varied widely and focused on different outcomes, including direct assessment techniques, such as observation of teaching performance, and indirect assessment techniques, such as student satisfaction, faculty perceptions of the program, and cooperating teachers and administrators' perceptions of the student-teacher and program. Almost half the programs had some observation mechanism for evaluating the classroom performance of prospective teachers. When direct assessments were used, they were often combined with indirect assessment methods in ways that provided a comprehensive picture of program impact (Aksamit, Hall, & Ryan, 1990; Benner & Judge, 2000; Cambone, Zambone, & Suarez, 1996; Corbett et al., 1998; Snell et al., 1997). For example, at Johns Hopkins University, faculty evaluate program effectiveness using (a) direct observations of student-teachers, (b) ratings by supervisors of graduates' competence, (c) surveys from supervisory personnel comparing program graduates to other

beginning teachers, (d) performance evaluation data on beginning teachers, (e) self-report data from program participants, and (f) certification or graduation rates of program participants (Rosenberg & Rock, 1994).

Twenty (31%) of the programs used only indirect assessment techniques for establishing program effectiveness. Most of these evaluations used surveys or interviews with current or former students as the only method for providing feedback about the program (Belknap & Mosca, 1999; Bay & Lopez-Reyna, 1997; Goodwin, Boone, & Wittmer, 1994; Minner, Tsosie, Newhouse, Owens, & Holiday, 1995). A smaller number of programs created a more robust assessment by combining several indirect assessment methods (Keefe et al., 2000; Sobel et al., 1998; Panyan, Hillman, & Liggett, 1997).

Focusing on Inclusion and Cultural Diversity

Student diversity was an important feature for 54 (84%) of the described programs. In 22 (34%) program descriptions, authors mentioned inclusion or cultural diversity as program topics (Andrews et al., 2003; Benner & Judge, 2000; Campbell & Fyfe, 1995; Corn & Erin, 1996; Ganser, 1996; Lehmann & Sample, 1997; Rude et al., 1998), but the authors did not always discuss the pedagogy used to help students learn relevant skills. Approximately one third of the authors delineated fieldwork and classroom practices they used for ensuring that graduates could work in inclusive settings. Eighteen articles (28%) described methods used to help teachers address the cultural and linguistic needs of students with disabilities, and 17 (27%) discussed how the faculty helped students learn about inclusion. An additional 32 (50%) programs addressed both inclusion and cultural diversity, reflecting a broader focus on diversity that included children with disabilities as well as those with diverse cultural and linguistic needs (Corbett et al., 1998; Keefe et al., 2000; Kemple et al., 1994; Otis-Wilborn & Winn, 2000; Sobel et al., 1998).

Maintaining a Positivist or Constructivist Orientation Toward Teacher Knowledge

Variations in program orientation are not surprising, given the strong role that behavioral theory has played in special education and the emergence over the past 2 decades of a more constructivist philosophy in special education. A strong, competency-based approach to teacher education reflected in many programs is one indicator of the role that positivist thought has played in special education. This approach assumes that a specific set of knowledge and skills exists and should be disseminated to students (Blanton, 1992).

The majority of program descriptions included competencies that students were expected to acquire; however, the manner in which competencies were addressed either was not clear or varied depending on the orientation of the program. (e.g., see Emond, 1995; Heston, Raschke, Kliwer, Fitzgerald,

& Edmiaston, 1998; Salend & Reynolds, 1991; Sebastian, Calmes, & Mayhew, 1997). Twenty (31%) teacher education programs adopted approaches to teacher education (Grisham-Brown, Collins et al., 2000; Miller et al., 1999; Russell et al., 1992; Snell et al., 1997) that viewed teacher learning as an accumulation of knowledge generated by experts. This characterization of knowledge reflected an epistemological stance that acknowledges a single, valid body of knowledge that teachers should acquire through training—that is, a more positivist view of knowledge (Guba, 1990). Programs that subscribed to this epistemological orientation did so by either specifying competencies to be acquired in coursework and then applying them in practical settings or requiring students to use research-based methods in field experiences and then evaluating the effectiveness of those methods through single-subject methodologies (Lovingfoss et al., 2001; Salend & Reynolds, 1991).

Thirty-five (55%) of the descriptions suggested that program faculty viewed learning to teach from a different epistemological stance (Affleck & Lowenbraun, 1995; Anderson & Baker, 1999; Epanchin & Wooley-Brown, 1993; Hall et al., 1997). These teacher educators viewed teacher learning as the collective examination of multiple knowledge bases, including, but not limited to, knowledge generated by experts. This view of knowledge would be more commonly attributed to constructivist epistemologies (Guba, 1990). In these programs, teacher educators used a variety of strategies to help students examine their beliefs about instruction; integrate the knowledge they were acquiring in coursework with prior knowledge; acquire academic, social, and cultural knowledge about their students; and reflect on the impact of their instruction.

Although programs tended to present a particular orientation, we were not certain how pervasive orientations were. In fact, in some cases determining the program orientation was difficult. Moreover, some program descriptions indicated that faculty either blended or maintained multiple orientations to teacher knowledge and learning (Correa et al., 1997; Ryan, Callahan, Krajewski, & Flaherty, 1997; Salzberg, Lignugaris-Kraft, & Monson, 1997).

Conclusions About the Two Literature Bases

The special education programs in the literature that we reviewed share features with programs considered exemplary in general education. In both fields, teacher education is labor intensive, carefully crafted, focused on connecting theory and practice, collaborative, and invested in creating teachers who can respond to the needs of children and youth, particularly those with diverse needs. Some of the qualities of the exemplary general teacher education programs (e.g., clear programmatic vision, integrating subject-matter pedagogy with educational theory and field experience), however, are referred to minimally in special education. Similarly, special ed-

ucation teacher education programs have some unique features differentiating them from the exemplary general education programs.

Commonalities and Differences

Faculty both in the exemplary general education programs and in the reviewed special education programs stressed the importance of extensive, well-planned, and well-supervised field experiences. Similarly, faculty across programs stressed the importance of collaboration between faculty, school personnel, and preservice and inservice teachers. We deemed this focus on collaboration and carefully crafted field experience important in light of findings from the IRA study that demonstrated that opportunities to participate in extensive collaboration during preservice education resulted in graduates who were better prepared than their peers to teach reading. Program descriptions in both areas, however, omit a focus on improving collaboration with families. Although some special education programs contained coursework on families, the articles did not make clear how students were taught to apply the knowledge and skills they acquired. Given that collaboration requires sophisticated interactive skills, particularly when teachers are dealing with people who may have a perspective different from their own, careful instruction in these skills seems necessary (Brownell & Walther-Thomas, 2002).

All the exemplary teacher education programs and many of the reviewed special education programs offered experiences focused on diversity, with special education faculty placing greater emphasis on students with disabilities. Furthermore, all the exemplary general education programs provided experiences likely to promote conceptual change about diverse learners (Wideen et al, 1998). How pervasive these practices are in special education programs is not clear, as only one third of the programs described the use of conceptual change strategies.

Teacher educators in the reviewed programs worked to document their impact on student learning. The exemplary general education programs collected both direct and indirect evidence of student performance to improve the programs. It was encouraging that 32 (50%) of the special education programs engaged in intensive evaluation efforts that included direct assessment of teacher performance. As teacher education programs come under increasing pressure to be accountable for demonstrating that their graduates are competent teachers (e.g., Title II reporting requirements under the Higher Education Act and the National Association for the Accreditation of Colleges of Education requirement for evidence of student performance), we expect to see more focused efforts on evaluation in general and special education and more research about how to best accomplish this task.

Program philosophies varied more widely in the special education programs than in the exemplary general education programs. The programs in the AACTE and IRA studies were founded in constructivist or constructionist epistemological views of how teachers acquire knowledge. In contrast, special

education programs represented more diverse epistemological views of teacher learning. Programs focusing solely on special education tended to embrace a more positivist epistemological stance on teacher knowledge. Programs adopting constructivist or constructionist orientations were often integrated or dual preparation programs or focused on preparing teachers to work with culturally and linguistically diverse students. What we do not know is whether or how varying epistemological views of teacher knowledge make a difference in teacher learning. In a review of the literature on coaching, both epistemological approaches to teacher learning seemed to result in positive gains (Nowak, 2003).

In the special education program descriptions, we saw limited evidence of two defining features of exemplary teacher education programs: a strong programmatic vision and a heavy emphasis on subject-matter pedagogy (e.g., reading, mathematics, science). In the AACTE, IRA, and NCRTL studies, a clear vision drove program design implementation. Moreover, faculty in the AACTE and IRA studies continually used these shared visions to revisit programs and make revisions. In special education, some program descriptions articulated a clear vision, whereas others did not. Programs combining general and special education or those focusing on cultural diversity were more likely to articulate themes that faculty used as the basis for making programmatic decisions (see Affleck & Lowenbraun, 1995; Aksamit et al., 1990; Bay & Lopez-Reyna, 1997; Benner & Judge, 2000; Kemple et al., 1994; Sobel et al., 1998).

Exemplary programs in general teacher education also placed heavy emphasis on subject matter pedagogy, whereas special education programs tended to focus on more generic pedagogy (e.g., instructional methods, assessment, individualized education plans). Only in the case of unified programs (see Affleck & Lowenbraun, 1995; Meyer, Mager, Yarger-Kane, Sarno, & Hex-Conteras, 1997; Norlander, Case, Reagan, Campbell, & Strauch, 1997; Ryan et al., 1997) and a few special education programs (Epanchin & Wooley-Brown, 1993; Giovani, Zide, & Banahan, 1974; Lovingfoss et al., 2001) did faculty focus on the integration of subject-matter pedagogy with special education and classroom practice. Many of the programs accomplished this integration by infusing special education competencies into subject-specific pedagogical coursework or teaching courses in integrated blocks. Because subject-matter knowledge is a factor in effective teaching, we need to know how its infusion into these special education programs affects the teaching methods of prospective special education teachers.

Special education programs were distinguished from the exemplary teacher education programs, and we suspect from general education teacher education programs overall, in terms of the amount federal funding received. Twenty-seven programs (42%) were funded through OSEP. There is no similar funding source in general education. These funded programs typically focused on specific needs within special education,

such as preparing teachers to serve students with severe disabilities or to work in inclusive environments. We do not know whether funded programs are similar to other programs offered at the same institution or how well integrated they are with long-term programs at the institution.

Comparisons within the special education literature revealed that OSEP-funded programs were very similar in their characteristics to nonfunded programs, with only a few exceptions. OSEP funded programs tended not to employ student cohorts as much as nonfunded programs (44% compared to 57%). Moreover, these programs were less likely to emphasize inclusion and cultural diversity in the coursework or to emphasize the acquisition of teacher knowledge from a constructivist epistemology (48% for OSEP-funded programs versus 59% for nonfunded programs). Comparisons between programs situated in teacher education institutions and other programs revealed slightly different findings. Programs situated in teacher education institutions were more likely to maintain program orientations that focused on cultural diversity and inclusion and emphasized constructivist or constructionist philosophies. Interpreting the findings about program orientation, particularly those related to philosophical orientation, and the role orientation might play in teacher learning is difficult. Programs focusing on cultural diversity, however, are likely to make a difference. In general education, teachers who receive preservice or inservice preparation on the needs of culturally diverse learners are more likely to indicate that they are better prepared and to secure stronger student achievement gains than those without this preparation (NCEETPRI, 2003; Wenglinky, 2000a). Finally, the reduced emphasis on direct assessment in research institutions and student cohorts may reflect the lack of resources available to support both research and teacher education missions.

Recommendations for Future Research

Our comparison of special education teacher education programs to exemplary general education programs suggests that certain features probably influence the quality of beginning special education teachers. For example, carefully designed field experiences that allow prospective teachers to integrate information they are acquiring in coursework may enable better knowledge and skill development in beginning teachers than programs that do not have this integration. Additionally, it is reasonable to assume that programs that facilitate a high degree of faculty and student collaboration and focus on instructional methods and knowledge for addressing student diversity will result in better outcomes for beginning special educators. Research-based link between teacher education program components and beginning teacher and student outcomes are necessary, however, to document the ways in which special education teacher education makes a difference.

Yet research in special education teacher education is almost nonexistent. If we are to respond to policymakers'

scathing criticisms of teacher education and their pressure to increase alternative routes to the classroom, we need research that demonstrates how teacher education makes a difference in securing highly qualified special education teachers. In crafting a teacher education research agenda that responds to these criticisms, we suggest several areas of studies that researchers must undertake immediately.

First, and arguably most important, we need to determine the valued outcomes of teacher education and how we assess these outcomes. At minimum, criterion measures must include retention in the classroom, as well as valid and reliable measures of teacher knowledge and behavior that can be linked to student learning. Without such measures, we cannot determine the impact of teacher education on students or the ways in which it affects the development of teachers.

In crafting teacher quality measures, researchers will confront challenging conceptual and design issues. They will need to define what it means to be a qualified beginning special education teacher. This is no small task when one considers the complex nature of special education teaching. Any measure of teacher quality must account for the knowledge needed for (a) teaching students with dramatically different needs, (b) providing instruction in different content areas, and (c) engaging in different roles to interact with students, administrators, and parents. Furthermore, researchers must identify ways of measuring student outcomes that are sensitive to what teachers can do in the classroom. Researchers in special education cannot rely on standardized national and state assessments of students as indicators of effectiveness. These assessments are not sufficiently sensitive to achievement growth for students in special education, particularly when they are administered at grade level. Nor do these tests capture other valued outcomes in special education, such as the ability to live independently or engage in desired social behaviors.

Second, we need to know how preparation programs make a difference. Currently, teacher educators create programs that include knowledge of validated practices and that meet some or many of the criteria for high-quality teacher education identified in the literature on general teacher education programs. Although the link between evidence-based practice and student achievement exists, no research exists to show that including this knowledge in teacher preparation programs or including specific teacher education program components make a difference in outcomes for special education teachers, and more important, for their students with disabilities. To identify the essential components of special education preparation programs, we need comparative studies that can control for the considerable variation found in special education preparation programs. Simple comparisons between program types, such as alternative versus more traditional routes, will be wrong-headed because the heterogeneity inherent in both types of programs will make such comparisons useless (Wenglinsky, 2000b). Our review suggests researchers might consider selecting programs according to specific features that

potentially make a difference in how teachers learn. For example, quality and extensiveness of field experiences might be one feature to consider in differentiating programs for further study. Researchers then must determine how variations in these program features make a difference in teacher and student learning.

Third, we need to understand if or how opportunities to acquire subject-matter knowledge influence special education practice. Research in general teacher education, although inconclusive (Wilson et al., 2001), suggests that teachers with subject-matter preparation achieve better student outcomes than graduates who lack that preparation. In the IRA study, teachers extensively prepared in literacy achieved stronger student literacy achievement gains than other beginning teachers, but they did not feel more prepared to teach mathematics (Flint et al., 2001). Until this point, conversations about subject-matter learning have not figured prominently in research studies of special education teachers. Instead, special education researchers have assumed that effective special education teachers are those who implement validated interventions. But can special education teachers implement validated interventions for individual students without a deep understanding of the content area and how students might develop in that content area? And, if subject matter is important, how would teacher educators best address it when special educators are responsible for teaching multiple subjects to students with varying disabilities in a variety of contexts? Moreover, do prospective teachers acquire stronger subject-matter knowledge in unified preparation programs in which pedagogy is addressed in specific content areas or in more traditional special education programs that tend to provide methods instruction targeted exclusively at disability levels (e.g. methods for students with mild disabilities)?

Finally, we need more research examining the impact of OSEP funding on teacher preparation. To date, we know little about the impact of OSEP-funded programs on teacher quality or retention in special education. We do not know if OSEP-funded programs are sustainable, what institutional factors affect the sustainability of these projects, and if these programs embrace effective practices in teacher education. Given the significant investment of federal dollars in the preparation of special education teachers, we need to know a good deal more about the impact of this investment.

At a time when teacher education is coming under increased scrutiny, a rigorous research agenda seems more crucial than ever. We need greater commitment on the part of the federal government and professional organizations to fund multi-institutional, longitudinal studies of teacher education. The teacher education enterprise is incredibly complex, particularly in special education where beginning teachers play many different roles and serve students with diverse needs. Consequently, the special education research community needs sufficient support to address these complexities and to establish a professional knowledge base in teacher education that

can rival that which exists in the instructional innovation literature for students with disabilities.

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