Lessons from Special Education Research

By Paul T. Sindelar, Anne G. Bishop, Mary T. Brownell, Michael S. Rosenberg, & Vincent J. Connelly

Paul T. Sindelar is a professor, Anne G. Bishop is project director and assistant scholar at the Center on Personnel Studies in Special Education, and Mary T. Brownell is an associate professor, all with the College of Education, University of Florida, Gainesville, Florida; Michael S. Rosenberg is a professor at Johns Hopkins University, Baltimore, Maryland; and Vincent J. Connelly is an assistant professor at the University of New Hampshire, Durham, New Hampshire.

Although the ultimate goal of teacher education is to provide an adequate supply of highly qualified teachers for our nation's schools, many factors hinder its success. In special education, too few people enter the field, and a policy context that promotes easy entry via unconventional preparation threatens to dilute teacher quality. In this challenging and complex context, teacher educators struggle to improve their work and to assess innovations credibly. In this paper, we describe the particular position of the special education teacher education community as it attempts to provide a qualified teacher for every special education student. We begin by describing our center and the process that led to the development of a research agenda. We also

provide an overview of four studies underway and how they provide insight about assessing innovations. In the last section, we discuss what we have learned thus far.

The Special Case of Special Education

In special education, the figure 10% has utility. Students with disabilities make up roughly 10% of all school children, for example, and special education teachers make up roughly 10% of the teaching workforce. It used to be that roughly 10% of all special education teachers were not fully certified — but not any more. In 2000-01 and 2001-02, the percentage jumped from 9.9% to 11.5% to 12.1% (U. S. Department of Education, n.d.). The message in these numbers is dismaying. In 2001-02, over 800,000 special education students were served by less than fully certified teachers. For them, the promise a free, appropriate public education may well go unfulfilled.

The problem of inadequate numbers of fully qualified teachers has proven as persistent as it is pervasive. In defying simple solution, it also has proven pernicious. In the early years of the IDEA era, when "recruit more teachers and train 'em up" became the battle cry, the problem seemed simple. Now, 25 years later, special education teacher educators are dismayed and bewildered by our inability to meet the demand for special education teachers — in spite of a mammoth federal investment in teacher preparation. The problem is more complicated than we ever imagined, but that is small consolation.

Against this backdrop, the Office of Special Education Programs (OSEP) chose to support a policy research center and to charge that center with the responsibilities to (a) synthesize what is known about supply and demand, preparation, and licensure; (b) develop a research agenda; and (c) conduct studies to inform teacher education policy and practice. A coalition of researchers from Johns Hopkins, Vanderbilt, and the University of Florida received the award, and in the following section, we describe what we learned from the syntheses and how we have used them to develop a research agenda.

Developing a Research Agenda — The Process

Our work at the Center on Personnel Studies in Special Education (COPSSE) requires us to meet rigorous research standards and maintain relevance to the policy community. We first engaged the research community in conducting comprehensive reviews of the special education teacher education literature. We commissioned papers on nine topics and organized them under headings of supply and demand (supply and demand, retention and attrition, diversifying the workforce), professional preparation (exemplary practices, models and measures of teacher quality, induction), and licensure (licensure patterns, reciprocity, and teaching as a profession). These papers along with a 10th on alternative certification that we borrowed from the National Clearinghouse on Professions in Special Education

(NCPSE) are available on our website, www.copsse.org. We used these papers to identify gaps in the knowledge base and, with the assistance of a research design panel, developed a preliminary research agenda. Later, we presented this agenda to policy makers and used their feedback to identify the most critical questions on our list.

Our work was to address policy makers' concerns, and we hoped that it might inform special education policy in the future. As our understanding of the literature and policy context evolved, we recognized the importance of determining what works in teacher preparation and how it might be delivered efficiently. These concerns not only frame the research agenda for our Center but also directly relate to the theme of this *Teacher Education Quarterly* issue, Assessing Innovations in Teacher Education. In the next sections, we describe the particulars of our research agenda and what we have learned about assessing innovations in the research we have undertaken.

Implementing the Research Agenda

Four studies are under way. In the beginning teacher quality study, we are attempting to link initial preparation, teacher quality, and student outcomes—fundamental connections much on the minds of researchers and policy makers alike. We have initiated three studies of alternative route preparation (AR) policy and practice. The first involves cataloguing AR programs, analyzing their contents, and developing a taxonomy of program types. In the second, we are analyzing data from the Schools and Staffing Survey (SASS, National Center for Education Statistics, 1994) for evidence of a link between initial preparation and sense of preparedness. The third is a study of the cost effectiveness of preparation alternatives. Each study is described in greater detail below.

Beginning Teacher Quality

The ultimate criterion of effectiveness for any teacher education program is the extent to which its graduates promote student success. However, isolating the effect of teacher education is a challenging problem for researchers, and the difficulties of documenting program effectiveness are well known (Kennedy, 1999b; National Center for Research on Teacher Learning, 1991). Nonetheless, doing so is of particular importance in the current political context. Recently, the ability of conventional teacher education programs to prepare teachers adequately has been called into question (U. S. Department of Education, 2002). The standard by which program effectiveness will be judged — by the impact it has on student outcome—has been set high (Greenwood & Maheady, 1997).

Perhaps even more problematic is the lack of consensus about what constitutes teacher quality and how it should be measured. Special education professionals have failed to reach consensus about effective teaching (Blanton et al., 2002) in spite of extensive research on effective interventions. Process product research

provided some insight into how what teachers do relates to what students learn, but ultimately this research failed to capture the complexity of teaching (Blanton, 1992). By contrast, recent research on literacy instruction has provided a detailed picture of what effective reading teachers do (Haager, Gersten, Baker, & Graves, 2003; Pressley, Allington, Wharton-McDonald, Block, & Morrow, 2001). The utility of this research for understanding beginning special education teacher practice must be considered.

Defining teacher quality on the basis of practices that teachers use comes with its own set of problems. For one thing, practices are seldom observed in isolation. Research in general education suggests that exemplary teachers integrate research-based practices and adapt them to meet the needs of their students (Haager et al., 2003; Pressley, et al., 2001). Second, the gap between our research knowledge and classroom practice is well-documented (Fuchs, Fuchs, Harris, & Roberts, 1996; Gersten, Chard, & Baker, 2000; Vaughn, Hughes, & Klingner, 2000; Greenwood & Maheady, 2001). To rely on evidence-based practices as a way of defining effective teaching may result in observational tools that are disconnected from what special education teachers do.

The complex nature of special education creates other problems for researchers. Special educators serve students whose needs vary widely across — and within — disability classifications and across age levels. Special education teachers may teach in resource rooms or self-contained classes. They may collaborate with their general education colleagues or have little or nothing to do with them. Work contexts vary from school to school and are unpredictable and idiosyncratic. Clearly, any assessment of classroom practice must adjust for such variables in addition to the content of lessons, students' ages, and the range of their cognitive and behavioral needs.

Finally, observational measures of classroom practice may be too costly to use in large-scale studies of teacher preparation (Blanton et al., 2002). Teacher education researchers have long sought proxies of teacher quality that may be used economically on a large scale (Ball, Camburn, Correnti, Phelps, & Wallace, 1999; Kennedy, 1999a; Rowan, Correnti, & Miller, 2001; Rowan, Schilling, Ball, & Miller, 2001). Among those used in previous research are: (a) logs in which teachers record their daily practices, (b) vignettes that depict instructional dilemmas or student assessments, to which teachers are asked to respond, and (c) beliefs inventories on which teachers rate appropriate instructional and management practices.

Because special education teacher education has been shaped by state k-12 certification across disability areas, assessing teacher quality necessitates a focused approach. The beginning teacher quality study was designed with a focus on literacy instruction so as to mitigate these complexities. Over the next 3 years, we have planned studies to link initial preparation, beginning teacher quality, and student outcomes, but to do so requires technically sound and credible assessments of beginning teacher quality and teacher preparation. We first conducted a pilot study of the classroom practices and beliefs of special education teachers completing their 1st, 2nd, or 3rd year. We focused on reading instruction in intermediate

grades for students with high incidence disabilities in co-teaching or resource room programs. We hoped this tight focus would minimize the variability in teacher and student performance; we also hoped to capitalize on the extensive knowledge base that exists on what constitutes effective reading instruction.

We observed 17 beginning special education teachers to determine both their general teaching abilities and their specific skills in teaching reading. We also surveyed and interviewed the participants about their initial preparation and the school contexts in which they worked. Student achievement data also were collected. This pilot study allowed us to refine the observation instrument and to streamline the observation process. We often observed in pairs, to establish common understandings of observational codes as well as to assess inter-rater agreement.

Policy Studies in Teacher Education Preparation

Some policy makers have posited that substantive reform in education will occur only if those outside the educational establishment initiate it. The prevailing conventional wisdom toward teacher education also tends to be highly critical and dismissive, a major consequence being the proliferation of options that dilute the influence of teacher education (Sindelar & Rosenberg, 2000). These options, such as alternative routes to certification (ARs), distance learning, web-based teacher education, and even standardized testing are often touted as creative alternatives for individuals who want to teach but who cannot abide pedagogical training (Thomas B. Fordham Foundation, 1999). In fact, the U.S. Department of Education (2002) has proclaimed that "ARs, as opposed to traditional routes offered by colleges of education, streamline the process of certification and move candidates into the classroom on a fast-track basis" (p.15).

Although policy makers have touted AR programs as bold and innovative, we know surprisingly little about them. In their review of special education AR programs, Rosenberg and Sindelar (2001) found that while large numbers of people are enrolled in AR training, there is very little empirical research on the nature and efficacy of specific programs. They asserted that the available literature represented merely the "tip of the AR iceberg" and that a large underground economy for teaching credentials was in place in many areas of the nation. Moreover, ARs are so diverse that it may no longer be reasonable to treat them as a homogeneous group. AR options range from fast track survival training to sophisticated, high tech programs for individuals with pertinent experience (Feistritzer, 1998; Hillkirk, 2000).

It is imperative to develop a valid and reliable knowledge base about alternative approaches to special education teacher preparation. The range and variability of ARs coupled with limited research-based evidence have created a dilemma for special education teacher educators. Faced with massive and persistent shortages of personnel, tempted by policies and practices heralded as bold and creative, they need guidance so as to avoid shortsighted and expedient solutions (Rosenberg & Sindelar, 2001). These concerns led to the development of the three AR policy studies.

Indexing and describing AR programs for special educators. The purpose of this study is to catalog and describe all AR programs nationally. In partnership with the Council for Exceptional Children and National Clearinghouse for Professions in Special Education (NCPSE), we have developed a searchable web-based database in which AR programs in each of the 50 states are listed and described. We are assessing how AR programs differ on (a) sponsorship and alignment, (b) length and intensity, (c) participant demographics, among other variables, and (d) reviewing how state policy contexts influence the content and structure of AR programs.

We first contacted state certification officers, who identified colleagues responsible for AR program oversight, from whom we obtained program contact information. To ensure that we had a complete listing, we cross-referenced our lists with Title II data on AR activity in each state. Finally, a structured interview about programmatic features was conducted with AR project directors.

Identifying differences between alternatively and traditionally trained special educators. In addition to the argument that AR will ameliorate the shortage of special educators, especially in urban and rural districts, two other arguments for AR have been advanced. First, it is argued that AR can diversify the teaching force by recruiting more male, minority, and mature persons into the special education teaching force (Cook & Boe, 1995). It has been posited that ARs can improve the quality and effectiveness of the teaching force by recruiting persons who are more capable than candidates who complete traditional programs and who have had a broader range of experiences prior to entering teaching (Boe, Cook, Bobbitt, & Terhanian, 1998). We know little about the validity of these arguments, and in this study we intend to compare the number, demographics, and self-efficacy of those who have entered teaching through ARs and traditional routes. We will determine whether AR programs have diversified the special education public teaching force by recruiting more male, minority, and mature people, and reduced the teacher shortage by increasing the number of special educators teaching in urban and rural areas where shortages are most severe.

This study will be based on an analysis of data from the teacher survey of the 1993-94 and 1999-2000 administrations of the SASS. The SASS teacher sample is nationally representative. Independent variables for the study consist of teacher demographics (gender, income, race, age), teacher academic background, degrees held, previous work experience, and specialty field. Dependent variables include sense of preparedness, intent to remain in teaching, and self-efficacy.

Cost effectiveness of preparation options. Few studies of cost or cost effectiveness of teacher preparation are available in the literature (Darling-Hammond, 2000; Denton & Smith, 1985; Fowler, 2003; Lewis, 1990; Rice & Brent, 2002), and none has yet addressed the cost effectiveness of special education teacher preparation. Furthermore, although Darling-Hammond and Fowler included fast-track programs in their analyses, only Rice and Brent addressed the full range of training alternatives (and they estimated only cost, not benefit). The cost effectiveness study,

conducted in collaboration with economists at the University of Florida's Bureau of Economic and Business Research, was designed to advance the existing literature by focusing on special education teacher preparation and by considering alternative route programs other than fast track routes. The purpose is to develop a marketplace model of special education teacher supply and demand to guide policy makers as they allocate limited training resources among preparation alternatives.

Using outcomes from the AR Indexing study, cost estimates are being developed for various preparation prototypes. Estimates of attrition and teacher quality are being derived from both the AR catalog and information available in the literature. This initial work will allow us to identify or develop better estimates of model parameters. In its simplest form, the marketplace model describes a function that relates supply of special education teachers to wages. In this simple model, increasing wages may reduce or even eliminate shortages. However, increasing wages is a politically untenable solution, and shortages may also be addressed by supplementing the supply of teachers willing to work at current wages or by subsidizing the opportunity costs of preparation. To augment supply, training alternatives must tap new populations of trainees, suggesting that one important criterion by which a training alternative must be judged is its potential to contribute uniquely to supply. Because it seems unlikely that supply could be supplemented at current wages without lowering professional entry requirements, maintaining quality becomes a second important consideration.

The effectiveness of subsidizing trainees' opportunity costs will depend on the elasticity of supply, that is, the extent to which increases in subsidies result in increases in enrollments. It may well be that different elements of supply are more or less responsive to subsidization. For example, the supply of traditional college-aged students may be relatively inelastic in that many of them would attend college and elect an appropriate major regardless of the amount of aid they might receive. On the other hand, most paraprofessionals would be unable to attend step-up programs without substantial subsidies, so that their supply is more elastic. It can be argued that OSEP's sustained investment in teacher preparation — which has underwritten the remarkable growth of the special education teaching workforce over the past 20 years (American Youth Policy Forum, 2002) — demonstrates that the supply of special education teachers is generally elastic. It also attests to the wisdom of requiring grantees to maximize the proportion of grants committed to student support.

Other variables also are being factored into the model, notably teacher quality and attrition. Attrition influences supply at both the time of program completion (when some prospective teachers choose not to teach) and during the first several years of teaching, when attrition is most likely. To assess cost effectiveness, the proportions of trainees who both enter and remain in teaching must be estimated. Furthermore, assessments of teacher quality — performance on state licensure tests, supervisors' ratings, etc. — will allow for further differentiation based on benefit to students with disabilities.

What Have We Learned

In this section, we describe key outcomes for each of the studies.

Beginning Teacher Quality Study. Despite the attempt to reduce variability by focusing on a specific age level, disability, service delivery model, and content area, challenges remain due to the manner in which special education is delivered in schools and the variable conditions of special education teachers' work. In our pilot study, the teachers worked with target students from 90 minutes a week to 90 minutes a day, a 5 times difference sure to introduce variance in student performance that may be wholly unrelated to teacher quality. Moreover, all students in the study spent the majority of their day in general education, and the quality of the instruction they received there differed dramatically from one classroom to the next. Some service delivery models were better organized and more coherent than others. For instance, one special educator worked with two certified general education teachers to provide intensive reading instruction to 18 low achieving students and students with disabilities. In the same district, another special education teacher worked with one paraprofessional to provide reading instruction to 25 fourth and fifth grade students, all of whom had disabilities. Obviously, such dramatic differences in service delivery and the conditions of teaching make it difficult to isolate special education teachers' contributions to student achievement.

Despite this complexity, we have identified qualities that seemed to differentiate the most expert beginning teachers from teachers judged to be competent or struggling. Using qualitative data from classroom observations, we identified one beginning teacher whose teaching practices resembled those of expert reading teachers (Haager et al., 2003; Pressley, et al., 2001). The instruction provided by our expert beginner emphasized all critical elements of reading instruction (National Reading Panel, 2000; Torgesen, 2003): (a) more explicit instruction and practice; (b) more intensive instruction, including more time and smaller teacher-student ratios; and (c) more scaffolding and emotional support. Data from teacher interviews and preparation surveys suggested that the beginning teachers with intensive preservice and inservice opportunities exhibited a higher level of skill in teaching reading. In addition, the analysis of the classroom practices of nine beginning teachers revealed teaching behaviors linked to high student engagement during reading instruction—practices that most novice teachers need time to master (Reynolds, 1995). The follow up study will provide additional insights into these initial findings across state contexts.

The Policy Studies. Clearly, alternative routes are proliferating. To date, our catalog includes 160 AR programs in 30 states. The data are incomplete, of course, and no information has yet been obtained from several key states. However, we have determined that six states with nine or more programs account for 68% of all the programs identified to. In fact, California and Texas alone account for nearly 45% of them. The pace of AR growth is so fast that by the time a count is done, it is

outdated. When we present these data, audience members alert us to new programs that do not show up on lists.

In the context of severe and chronic shortages, AR proliferation may be inevitable, particularly to the extent that they reach new populations of trainees and thus contribute uniquely to the supply of new teachers. Today, training resources are limited, and political support for teacher preparation is faltering. States must invest training funds judiciously to maximize supply. In the public domain, it is not enough merely for new programs to attract students who previously had availed themselves of other training alternatives.

It seems ironic that as the availability of training options has proliferated, special education teacher shortages have not diminished (and may be increasing). Perhaps the assumption that AR programs tap primarily new pools of teacher candidates and contribute uniquely to supply is wrong. Perhaps, in spite of their designs, programs compete for the same pool of candidates, which has not increased. After all, teacher education programs were offering alternative routes long before the term was coined. For example, although the phrase *career changers* has a contemporary ring, post-baccalaureate licensure and degree programs were offered long before the term ever entered the teacher education lexicon. It may also be the case that the special education teachers we consider as not fully certified are fully qualified teachers in other disciplines and that instead of working toward special education licensure, they leave special education when positions for which they are fully qualified come available. In any case, the wisdom of investing state training funds in programs that supplement supply seems compelling, as does using unique contribution to supply to assess the merits of new training options.

Much of the growth in AR programs is occurring in the for-profit sector, and such programs have no obligation to avoid competition. In fact, for-profit sector growth benefits the state even when it does compete for students with public programs. To the extent that for profit programs are successful in attracting students who otherwise would have attended an existing publicly funded program, costs shift from the state to the consumer, and the state spends less for an equivalent supply. To the extent that for-profit programs also attract students who would not or could not attend a public program — and there is reason to believe they do (Rosenberg & Sindelar, 1998), they also supplement supply at little or no cost to the state.

In the studies of alternative route programs, we have learned that cost analysis must include consideration of time. Although point-in-time comparisons of program costs have utility, the information may be misleading. For one thing, not all participants complete programs, and not all program completers go on to teach. If the denominator in a per capita cost computation represents graduates who go on to teach, then per capita costs increase less for high completion rate and high entry rate programs than for low completion and entry rate programs. For this reason, completion and entry rates must be considered in all cost analyses, regardless of how difficult it is to obtain.

Retention must be factored into the calculation. If the denominator in the per capita cost equation is further reduced by the number of teachers lost to attrition, per capita costs increase again, but less so for programs whose graduates remain in teaching longer. Entering program and teacher attrition into cost determinations can have surprising and dramatic effects. For example, in a cost comparison of 4-year, 5th year, and fast-track alternative route programs, Darling-Hammond (2000) found that the initial efficiency of fast-track programs was lost when attrition was factored in. Three years out, per capita costs for the 5th year program were substantially less than per capita costs for either 4-year or alternative route programs. Four-year programs had lost most participants at graduation; AR programs had lost most participants during the first 3 years of practice.

Conclusions

Once accountability was established as a cornerstone of current education policy, it was only a matter of time before teacher education programs would be held to the same standard as P-12 schools. Teacher education programs are required to demonstrate impact on important educational outcomes such as student learning. Establishing the warrant of teacher preparation, no less innovation in teacher preparation, is no longer an option; it is an imperative. To the extent that public policy reflects the sentiment of the citizenry, it is clear that the U. S. public no longer accepts on faith the proposition that teacher education makes a difference.

We have argued that assessing teacher education innovation is a challenge. Part of the challenge lies in relating what we do to student outcomes. Years ago, the process product research showed that knowing how effectively teachers teach and how well they organize and manage their classrooms accounts for only a small proportion of the variance in student achievement. Linking the nature and quality of initial preparation to how well teachers teach and manage can be equally elusive, especially for experienced teachers with long histories of participation in professional development and successful classroom practice. Being accountable for connecting initial preparation to student outcomes is a daunting prospect for teacher educators.

We have explained the challenges of assessment in special education teacher preparation. Graduates of special education programs go on to teach students with differing disability classifications, of different ages and ability levels, and within different service delivery models. Even when we restricted the sample to first, second, and third-year teachers who teach reading to 3rd to 5th grade students with learning disabilities in resource rooms or co-teaching arrangements, the diversity of classroom practice and program organization was astonishing. We currently are sifting through these vagaries to identify and isolate the essence of what beginning teachers do that relates to what their students learn. Preparation appeared to influence beginning teachers' practices, and the practices they used could be related

meaningfully to student engagement. We are optimistic that we are on the right track. On the other hand, whether strong and meaningful links to student outcomes can be established remains to be seen.

We see a silver lining in the proliferation of alternative routes. We presume that if traditional teacher preparation is required to demonstrate its warrant, all forms of teacher education will be held to the same standard. As those of us in special education struggle to provide an adequate teaching workforce and as training options proliferate to meet demand, innovations will be tried and tested. Some will be found successful, and some will be found wanting. It is hard to see how teacher education does not stand to benefit generally as accountability and experimentation mix. We already have learned the importance of coherent, well integrated field experiences, for example. If programs may innovate in exchange for the obligation of assessing the impact of innovations, we will be granted what many teacher educators have been seeking for years: freedom in exchange for responsibility.

In the current policy context, much is at stake for teacher educators. We have been challenged to demonstrate the warrant of our work and to do so using the high standard of impact on student outcomes. Never has innovation been more important, and never has our ability to assess the impact of our work been so instrumental to our future. Teacher education researchers must persist in their effort to establish credible links between what they do, how well beginning teachers teach, and how much their students learn. Given the complexities of schools, this is no easy task, and it is particularly challenging in special education.

In special education personnel preparation, fewer graduates are more widely dispersed, and no two are likely to be working in quite the same kind of program. But graduates' impact on student achievement is not the only important product of teacher education. In a field where shortages exist, numbers are important, as are factors that diminish numbers. Special education teacher education programs are cost effective to the extent they contribute uniquely to the supply of fully qualified teachers. They are cost effective to the extent that their graduates persist in teaching. Attrition takes many shapes. In addition to its familiar sense of a practicing teacher leaving the field, attrition manifests itself when participants fail to complete programs and when graduates choose not to enter the field.

Thus, innovations in special education teacher preparation are noteworthy when they can be shown to relate to (a) the breadth and quality of graduates' instructional and management practices, (b) the achievement of their students, (c) increased outputs of qualified teachers, and (d) reduced attrition in all its forms. Other measures lack credibility among policy makers, and worthy innovations may be disregarded if no credible measures are used in their assessment.

References

American Youth Policy Forum and Center on Education Policy. (2002). *Twenty-five years of*

educating children with disabilities: The good news and the work ahead. Washington, DC: Author.

Ball, D. L., Camburn, E., Correnti, R., Phelps, G., & Wallace, R. (1999). *New tools for research on instruction and instructional policy: A web-based teacher log.* Seattle, WA: Center for the Study of Teaching and Policy.

Blanton, L. P. (1992). Preservice education: Essential knowledge for the effective special education teacher. *Teacher Education and Special Education*, *15*(2), 88-96.

Blanton, L. P., Sindelar, P. T., Correa, V. I., Hardman, M., McDonnell, J., & Kuhel, K. (2002) *Conceptions of beginning teacher quality: Models for conducting research.* Gainesville, FL: University of Florida: Center on Personnel Studies in Special Education (COPSSE).

Boe, E. E., Cook, L. H., Bobbitt, S. A., & Terhanian, G. (1998). The shortage of fully certified teachers in special and general education. *Teacher Education and Special Education, 21*(1), 1-21.

Cook, L. H., & Boe, E. E. (1995). Who is teaching students with disabilities? *Teaching Exceptional Children, 28*(1), 70-72.

Darling-Hammond, L. (2000). *Solving the dilemmas of teacher supply, demand, and standards: How we can ensure a competent, caring, and qualified teacher for every child.* New York: National Commission on Teaching and America's Future.

Denton, J. J., & Smith, N. L. (1985). Alternative teacher preparation programs: A cost-effectiveness comparison. *Educational Evaluation and Policy Analysis, 7*, 197-205.

Feistritzer, C. E. (1998, February). Alternative teacher certification-An overview [On-line]. Available: http://www.ncei.com/Alt-Teacher-Cert.htm

Fowler, R. C. (2003). The Massachusetts signing bonus program for new teachers: A model of teacher preparation worth copying? *Education Policy Analysis Archives, 13*(11). Retrieved September 10, 2003, from http://epaa/asu.edu/epaa/v11n113/.

Fuchs, D., Fuchs, L., Harris, A., & Roberts, P.H. (1996). Bridging the research-to practice gap with mainstreaming assistance teams: A cautionary tale. *School Psychology Quarterly, 11*, 244-266.

Gersten, R., Chard, D., & Baker, S. (2000). Factors enhancing sustained use of research-based instructional practices. *Journal of Learning Disabilities, 33*, 445-457.

Greenwood, C. R., & Maheady, L. (1997). Measurable change in student performance: Forgotten standard in teacher preparation? *Teacher Education and Special Education, 20*, 265-275.

Greenwood, C. R., & Maheady, L. (2001). Are future teachers aware of the gap between research and practice and what should they know? *Teacher Education and Special Education, 24*, 333-347.

Haager, D., Gersten, R., Baker, S., & Graves, A. W. (2003). The English-language learner classroom observation instrument for beginning readers. In S. Vaughn & K. L. Briggs (Eds.), *Reading in the classroom: Systems for the observation of teaching and learning* (pp. 111-144). Baltimore, MD: Brookes.

Hillkirk, R. K. (2000). Effective models for alternative programs in teacher education. In D.J. McIntyre & D.M. Byrd (Eds.), *Research on effective models for teacher education: Association of teacher education yearbook VII* (pp. 195 –202). Thousand Oaks, CA: Corwin.

Kennedy, M. M. (1999a). Approximations to indicators of student outcomes. *Educational Evaluation and Policy Analysis, 21*(4), 345-363.

Kennedy, M. M. (1999b) The problem of evidence in teacher education. In R. A. Roth (Ed), *The role of the university in the preparation of teachers* (pp. 87-107). London, UK: Falmer Press.

Lewis, D. R. (1990). Estimating the economic worth of a 5th year licensure program for teachers. *Educational Evaluation and Policy Analysis, 12*, 25-39.

National Center for Education Statistics. (1994). *An overview of the SASS and TFS* (NCES 94-440). Washington, DC: Author.

National Center for Research on Teacher Learning (1991). *An agenda for research on teacher learning*. East Lansing, MI: Michigan State University.

National Reading Panel. (2000). *A report of the national reading panel: Teaching children to read.* Washington, DC: National Institute of Child Health and Human Development.

Pressley, M., Allington, R. L., Wharton-McDonald, R., Block, C. C., & Morrow, L. M. (2001). *Learning to read: Lessons from exemplary first-grade classrooms. Solving problems in the teaching of literacy*. New York: Guilford.

Reynolds, A. (1995). The knowledge base for beginning teachers: Education professionals' expectations versus research findings on learning to teach. *The Elementary School Journal, 95*. 199-220.

Rice, J. K., & Brent, B. O. (2002). An alternative avenue to teacher certification: A cost analysis of the pathways to teaching careers program. *Journal of Education Finance, 27,* 1029-1048.

Rosenberg, M. S., & Sindelar, P. T. (1998). The impact of market driven higher education practices on professional teacher development. *Teacher Education and Special Education, 21,* 227-235.

Rosenberg, M. S., & Sindelar, P. T. (2001). *The proliferation of alternative routes to certification in special education: A critical review of the literature.* Arlington, VA: The National Clearinghouse for Professions in Special Education, The Council for Exceptional Children. Available: www.special-ed-careers.org.

Rowan, B., Correnti, R., & Miller, R. (2002). *What large-scale, survey research tells us about teacher effects on student achievement: Insights from the prospects study of elementary schools*. Ann Arbor, MI: University of Michigan, Consortium for Policy Research in Education.

Rowan, B., Schilling, S. G., Ball, D. L., & Miller, R. (2001). *Measuring teachers' pedagogical content knowledge in surveys: An exploratory study*. Ann Arbor, MI: University of Michigan, Consortium for Policy Research in Education.

Sindelar, P.T., & Rosenberg, M.S. (2000). Serving too many masters: The proliferation of ill-conceived and contradictory policies and practices in teacher education. *Journal of Teacher Education, 51,* 188-193.

Thomas B. Fordham Foundation (1999). *The teachers we need and how to get more of them: A manifesto.* Washington, DC: Author.

Torgesen, J. K. (2003, May). *Reading First and special education: Working together to insure that all children learn to read.* Presentation to Florida Comprehensive System of Personnel Development Council, Clearwater, FL.

U. S. Department of Education. (2002). *Meeting the highly qualified teachers challenge: The secretary's annual report on teacher quality*. Washington, DC: Author.

U.S. Department of Education. (n.d.). *Table AC2. Number of special education teachers serving students ages 6-21, by state.* Washington, DC: Author. Retrieved May 27, 2004, from http:/

/www.ideadata.org/arc_toc4.asp#partbPEN
Vaughn, S., Hughes, M., & Klingner, J. (2000). Sustainability of research based practices. *Exceptional Children, 66,* 163-171.