LONG TERM TRENDS IN THE NATIONAL DEMAND, SUPPLY, AND SHORTAGE OF SPECIAL EDUCATION TEACHERS

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ABSTRACT

With a focus on both teacher quality and quantity at the national level, this research examined long-term trends in the demand, supply, and shortage of special education teachers for 16 school years from 1987-88 through 2002-03. These trends were based on data published in Annual Reports to Congress by the Office of Special Education Programs, USDE. Rapid growth in teacher demand for students with disabilities ages 3-5 was found, whereas the growth in teacher demand for students ages 6-21 was more gradual and paralleled the rate of growth in teacher demand in general education. Although teacher demand was mostly satisfied by growth in the supply of fully certified teachers, the shortage of fully certified teachers for students with disabilities ages 6-21 has been chronic since 1987-88, and has increased annually from 7.4% in 1993-94 to 13.4% in 2002-03 (shortage of approximately 54,000 special education teachers, including estimated vacant positions).
INTRODUCTION

The relationship between teacher supply and demand has been described as a “puzzle” based on “the interaction between quality and quantity” (Smith-Davis & Billingsley, 1993, p. 205). This interaction occurs at the local, state, and national levels, and opportunities and responsibilities to address demand-supply imbalances occur at all three levels. With a focus on teacher quality and quantity at the national level, the purpose of this research is to portray and interpret long-term trends in the demand, supply, and shortage of special education teachers (SETs) for 16 school years from 1987-88 through 2002-03.

The total national demand for teachers in public education is commonly defined as the number of teaching positions that have been established and funded, while the total supply of teachers is defined as the number of eligible individuals available from all sources who are willing to supply their services under prevailing conditions (Boe & Gilford, 1992). Ideally, teacher demand is balanced by an adequate supply. Teacher shortages are, of course, the result of either exceptional high demand in relation to supply and/or exceptionally low supply in relation to demand. An inadequate supply of teachers in relation to demand inevitably results in a shortage.

It is widely recognized that there has long been an imbalance between the demand for, and the supply of, SETs, thereby resulting in serious shortages (e.g., Smith-Davis & Billingsley, 1993; Council for Exceptional Children, 2000; McLeskey, Tyler & Flippin, 2004; Boe & Cook, in press). However, analysis of teacher shortages requires a distinction between two types of demand and the adequacy of supply in relation to each type:

- **Quantity Demand**: The demand for the number of teachers to fill all teaching positions that have been created and funded at the district level.
- **Quality Demand**: The demand for teachers with specific qualifications such as certification, degree major field, and teaching experience.

Unfortunately, the national quantity demand for SETs as defined above is not known precisely because current databases record the number of teachers employed, not the somewhat larger number of positions that have been established and funded. The difference between the number of filled positions and the number of positions that have been funded is the number of positions that are vacant.
For a period of five years in the 1990s (1993-94 through the 1997-98 school years), the Office of Special Education Programs (OSEP), the U.S. Department of Education (USDE), did provide information about the number of vacant teaching positions in special education in its Annual Reports to Congress (e.g., 1996). During this five-year period, the median number of vacant full-time equivalent (FTE) teaching positions in special education was about 3,600 positions (or 1.1% of total FTE positions). These vacant positions can be construed as the “quantity” shortage of SETs, i.e., the number of positions for which there was an insufficient supply of eligible individuals who were available and willing to accept positions under the terms of appointment established by hiring school districts. Though the national quantity shortage percentage was small, the number of classrooms without a teacher was not trivial.

These OSEP data on vacant teaching positions in special education may be the most reliable because they are based on population data. Other information about vacant teaching positions is available from two national sample surveys. Based on data from its Schools and Staffing Survey (SASS) for 1993-94, the National Center for Education Statistics (NCES) reported that only 0.2% of all teaching positions in public schools nationwide were unfilled (Henke, et al., 1997). This percentage of vacant teaching positions for all teachers is much lower than the 1.1% reported for SETs during the mid-1990s in OSEP’s Annual Reports to Congress. The Henke et al. report can be disregarded here because it did not break down the vacant positions in special education per se. More recently, a report based on a national survey entitled Study of Personnel Needs in Special Education (SPeNSE) (conducted in 1999-00 for OSEP) stated that 2.9% of teaching positions in special education (12,241 positions) were either vacant or filled by substitute teachers (Carlson, Brauen, Klein, Schroll, & Willig, 2002). This percentage of teaching positions is obviously much higher than the 1.1% reported in OSEP’s Annual Reports to Congress during the mid-1990s. The Carlson et al. report can be disregarded here because it did not break down the vacant positions from the substitute teacher positions. Consequently, the percentage of vacant teaching positions in special education (1.1%) reported by OSEP remains the best available estimate. Thus, the total demand for SETs (i.e., the number of teaching positions created and funded) can best be approximated my multiplying the number of filled positions by 101.1%.

Regarding quality demand, all states in the U.S. require that teaching positions be filled with teachers who are fully certified in their position (National Association of State Directors of Teacher Education & Certification, 2003). Accordingly, the quality demand for fully-certified teachers is numerically the same as the quantity demand (i.e., the number of teaching positions that have been
Based on OSEP data, McLeskey et al. (2004) reported that 11.4% of all SETs during the school year 2000-01 lacked appropriate certification. This lack of certification can be construed as one index of the “quality” shortage of SETs. In 2000-01, this shortage was 47,532 positions filled by teachers without full certification (McLeskey et al.). The quality shortage of SETs was substantial, and well over 10 times as great as the quantity shortage identified above.

Of course, the demand for qualified teachers involves much more that full certification per se. The No Child Left Behind Act of 2001 (NCLB) defined the concept of a “highly qualified teacher,” and prescribed that all public school teachers of core subject matters be highly qualified by the end of the 2005-06 school year (USDE, 2004). A highly qualified teacher was defined by: (a) a bachelor’s degree, (b) full certification, and (c) demonstrated expertise in the subject matter of each core subject taught. Thus, there is a federal statutory quality demand for teachers who attain all three qualifications. Since all teachers of core subjects are required to be highly qualified by NCLB, the size of the national quality demand for such teachers is the same as the quantity demand for such teachers (i.e., the number of such teaching positions created and funded). To the extent that the supply of qualified teachers does not satisfy the quality demand, there is a shortage of qualified teachers. This shortage, in turn, creates a quantity demand for the number of additional qualified teachers needed to satisfy the shortage.

There are two main sources of ongoing national data about the quantity and quality demand for SETs. The first is OSEP’s Data Analysis System (DANS). The second is the Schools and Staffing Survey (SASS) of the National Center for Education Statistics, USDE. These two data sources are largely complementary; each has strengths and limitations for analyzing teacher supply, demand, and shortage in special education. DANS (but not SASS) provides information annually about the numbers and certification status of teachers for students with disabilities ages 3-5, and the numbers of students with disabilities ages 3-21. It also provided information annually about all SETs and all students with disabilities. Among many other aspects of the teaching force, SASS (but not DANS) provides information about the (a) sources of supply of SETs, (b) qualifications of SETs in addition to certification status (e.g., teacher preparation, degree level, experience, etc.), and (c) teachers in general education. In other respects, both DANS and SASS provide information about the quantity demand for SETs for students with disabilities age 6-21, and the shortage of fully certified SETs for such students.

Therefore, only data from DANS can be used to assess trends in (a) the demand for SETs in relation to the numbers of students with disabilities ages 3-21, (b) the demand and shortage of SETs...
for students with disabilities ages 3-5, and (c) differences in the demand, supply, and shortage of SETs for students with disabilities ages 3-5 versus ages 6-21. Accordingly, this research capitalizes on the potential of DANS to provide unique insights into the supply, demand, and shortage of SETs. Other recent research with SASS capitalizes on its potential to provide such unique insights about SETs (e.g., Boe & Cook, in press; Cook & Boe, in press).

One of the fundamental responsibilities of policy makers and administrators in education is to assure that all teaching positions in our nation's public schools are filled by qualified teachers—the most basic dimension of which is that they be fully certified in their positions. In continuing efforts to fulfill this responsibility, policy makers and administrators in special education can benefit from basic information about the extent to which past initiatives have succeeded and/or failed—as quantified by sound data about teacher demand, supply, and shortage. The types of information about SETs that should be useful to policy makers and administrators to gain a better understanding of the problem of increasing teacher demand and shortages include (a) trends over time in the growth of demand for SETs, (b) trends over time in the supply and shortages of SETs, (c) relationships over time between growth in the number of students with disabilities and growth in the demand for SETs, (d) differences in the demand and shortage of SETs as a function of the level of students served, (e) differences in the demand and shortage of SETs as a function of specialization within special education, and (f) trends over time in the growth of demand for SETs in comparison with general education teachers (GETs).

Long term trend data about these and other important aspects of the supply, demand, and shortage of SETs are produced annually by DANS (except for teachers subdivided by specialization), and are published in OSEP’s Annual Reports to Congress (e.g., 1998). In this form, however, neither year-to-year changes nor long term trends in the teaching force in special education are readily accessible to policy makers, administrators, and researchers. Accordingly, the purposes of this research are to organize, analyze, and present data from DANS in a series of eight Figures that portray trends in the supply, demand, and shortage of SETs during 16 school years (1987-88 through 2002-03). Dissemination of information from DANS in this form should enhance their value to those responsible for assuring a qualified teaching force in special education. To accomplish this purpose, annual trend data published in OSEP’s 20th Annual Reports to Congress (1998, Section III) for nine school years (from 1987-88 through 1995-96) were extended seven more years through school year 2002-03.
**METHOD**

*Data Source*

Trends in the demand, supply, and shortage of special education teachers was based on information contained in OSEP’s *Annual Reports to Congress* from 1990 (reporting data for school year 1987-88) through 2005 (reporting data for school year 2002-03). School year 1987-88 was chosen as the base year because it was the first year for which data were reported separately for teachers serving students with disabilities ages 3-5 years and ages 6-21 years. School year 2002-03 is the last year for which data are currently available. The source of these data was OSEP’s DANS for the U.S. and Outlying Areas. This system contains national population data on special education students and teachers (counted in *full-time equivalent units*) that have been reported to OSEP by all states and outlying areas.

DANS records the total number of SETs, subdivided into those who were fully certified in their main teaching assignment and who were not fully certified. Fully certified SETs (including long-term substitutes) hold standard (or higher) certification or licensure (in the state in which they are employed) for the teaching position to which they are assigned. SETs *not* fully certified for the teaching position to which they are assigned may hold emergency, provisional, or other certification, or may be uncertified. Thus, SETs classified as not fully certified represent a range of qualifications less than full certification.

During the 16 years for which data were abstracted and analyzed for this report, the definitions of teacher categories used by DANS to collect and organize information were stable except for reporting of vacant teaching positions—a component of the total demand for SETs. For data from school years 1987-88 through 1992-93, the reporting of vacant teaching positions was combined with positions filled by teachers who were not fully certified. For five years from 1993-94 through 1997-98, the number of vacant positions was reported along with the number of not fully certified teachers. Since 1997-98, however, reporting of the number of vacant positions was discontinued. Instead, just the number of positions filled with fully certified and with not fully certified teachers has been reported.

Even though DANS provides information for the population of SETs in the nation, it is subject to various errors such as the accuracy of reporting and tabulation. Therefore, no particular data point for one year should be interpreted as error free. Instead, consistent data over more than one year provide the most reliable information about a variable of interest.
Analysis Procedures

Annual data from DANS for a 16-year period were organized and presented in four types of figures:

1. **Numbers of teachers**: This procedure provides information about growth over time in the absolute number of employed SETs.

2. **Cumulative percent growth of students and teachers**: This procedure provides information about percentage increases over time in the numbers of students with disabilities and in the numbers of teachers relative to a base line year (1987-88), cumulated year-by-year. Accordingly, rates of growth in the numbers of students and teachers can be compared on a common metric (i.e., percentage of growth over a base line year).

3. **Percentages of not fully certified teachers**: This procedure provides information about changes over time in the shortage of fully certified teachers as a percentage of total teachers. Accordingly, teacher shortage percentages for two student age groups can be compared on a common metric.

4. **Ratio of students to teachers**: This procedure provides information about changes over time in the number of students per teacher. Accordingly, student-teacher ratios for two student age groups can be compared on a common metric.

RESULTS

*Trends in the Demand and Supply of Teachers for Students Ages 3-5 Years with Disabilities*

Dramatic growth in the total demand for SETs (i.e., the number of teaching positions nationally) for students ages 3-5 years is shown in Figure 1. From 1987-88 to 1999-00, demand increased by 140% from about 12,700 to about 30,500 teachers. There was an even greater percentage increase (166%) in the supply of fully certified teachers in response to this demand. These trends demonstrate that the field of special education was remarkably successful through 1999-00 in meeting the rapidly increasing demand for teachers of students ages 3-5 years.

After thirteen years (1987-88 through 1999-00) of growth in teacher demand for students ages 3-5 years, demand appears to have stabilized during the following three years on the whole. Little, or no, significance should be placed in the apparent sharp increase in teacher demand shown for 2000-01 because it is out-of-line with the percentages in the immediately preceding, and following, years (and probably entails an unusual amount of reporting error).
Using school year 1987-88 as the baseline, Figure 2 shows the cumulative percentage increase during the following 15 years in the number of students with disabilities ages 3-5 and their teachers. As seen in Figure 2, the number of teachers for students age 3-5 grew at a higher rate over the 16-year period (137%) than did the number students they taught (growth of 102%). Thus, the student-teacher ratio necessarily declined modestly from 26.5:1 in 1987-88 to 22.6:1 in 2002-03—a condition generally welcomed by teachers and thought to foster enhanced student learning.

Trends in the Demand and Supply of Teachers for Students Ages 6-21 Years with Disabilities

In contrast with the rapid growth in teacher demand for students ages 3-5 years, a gradual growth occurred in the number of total teaching positions nationally for students ages 6-21 years, as shown in Figure 3. From 1987-88 to 2002-03, demand increased by 42% from about 284,300 to about 403,100 teachers. (If an adjustment were made for an estimated 1.1% of vacant positions in 2002-03, the total demand would be 407,500.) There was a lesser, but still noteworthy, increase of 37% in the supply of fully certified teachers in response to this demand. On the positive side, these trends demonstrate that the field of special education was successful in increasing the supply of
fully-certified employed teachers for students ages 6-21 by about 95,000 during the 16-year period analyzed here. On the negative side, this level of growth in fully certified teachers was well below the demand, as 49,700 employed teachers in 2002-03 were not fully certified.

Using school year 1987-88 as the baseline, Figure 4 shows the cumulative percentage increase during the following 15 years in the number of students with disabilities ages 6-21 and their teachers. As seen in Figure 4, the number of students age 6-21 grew at a very steady rate over the 16-year period while the rate of growth in the number of their teachers mostly lagged behind during the last nine years examined. Thus, the field of special education has not been able over time to either (a) increase the number of teaching positions in proportion to the growth of students, or (b) maintain the percent-age of fully certified employed teachers. Considered in isolation from other possible changes in the field, neither of these circumstances bodes well for the instruction of students with disabilities ages 6-21.
In contrast with Figures 1 and 3 that presented trends in the numbers of teachers that were not fully certified combined with vacant positions (the latter through 1997-98), Figure 5 presents these shortages as percentages of total teacher demand. These percentages are a measure of the teacher quality shortage (in terms of not fully certified teachers) for students with disabilities separately for ages 3-5 and 6-21 years.

As seen in Figure 5, the percentage shortage of fully certified teachers for students ages 3-5 declined substantially by 1998-99 to a level equivalent to the shortage of full certified teachers for students ages 6-21 (the 11% level). Since that time, the shortage of fully certified teachers for students ages 3-5 increased more rapidly than the increase in teacher shortage for students ages 6-21. By 2003-04, the shortage of teachers for students ages 3-5 (15%, representing 4,500 teachers) exceeded the level seen in 1991-92 (13% shortage, representing 3,100 teachers). Nonetheless, the field of special education reduced the shortage percentage of fully certified teachers for these stu-
Students from the higher levels seen during the four-year period from 1987-88 through 1990-91. Given the recent trend toward increasing shortage percentages, it is questionable whether these gains can be sustained.

In spite of the gradual growth in teacher demand for students ages 6-21 years, the shortage of fully certified teachers decreased somewhat from 9.4% in 1987-88 to 7.4% in 1993-94 (Figure 5). Since 1993-94, however, the shortage percentage has increased steadily. In addition, 1.1% should be added to the shortage percentages since 1997-98 to account for estimated vacant positions. Including estimated vacant positions, the shortage of fully certified teachers for students age 6-21 by 2002-03 was 13.4% (about 54,200 teachers). This finding defines the quality shortage of teachers (in terms of full certification) for students ages 6-21 years, and demonstrates that the field of special education has been unable to keep up with the long-term increasing demand for fully certified teachers.

In addition to the need to upgrade or replace the 49,700 employed SETs who were not fully certified, there is an annual national demand for about 26,000 entering teacher hires in special education.
education for students ages 6-21 years (Cook & Boe, in press)—all of whom should be fully certified in their main teaching assignment. However, the annual national production in 2001 of degree graduates with a major in special education teaching was only about 20,000 at the bachelor’s and master’s degree levels combined. Of these, almost half had already been employed as teachers at the time of graduation (Cook and Boe). Thus, new graduates in special education teaching are far from sufficient in numbers to fill open positions for entering teachers or to replace employed SETs who are not fully certified. Neither is the reserve pool (the other source of supply of entering teachers) sufficient for this purpose. These shortfalls in teacher supply represent a major reason why the shortage of fully certified SETs has been chronic during the 16 years studied here.

The magnitude of the chronic shortage of fully certified teachers for students ages 6-21 years with disabilities can also be viewed by contrasting the shortage of SETs with that of GETs. Available evidence suggests that, for students in grades K-12, the shortage of fully certified GETs stood at 10.5% (based on 1999-00 SASS data), whereas the comparable shortage of SETs stood at 13.7% (also based on SASS data, adjusted upward by 1.1.% to account for vacant positions) (Boe & Cook, in press).
Trends in Student-Teacher Ratios

Teacher shortages might be explained, at least in part, by policies designed to reduce the ratio of students per teacher. Such reduction would require a greater rate of increase in the number of teachers than the rate of increase in the number of students. Though the numbers of teachers for students ages 3-5 and 6-21 increased substantially during the years following 1990-91 (as shown in Figures 1 and 3), the rate of growth in the number teachers for students ages 3-5 was much greater than for students ages 6-21, as the trends in Figure 6 demonstrate.

The relationship between growth in the number of teachers and growth in the number of students is shown in Figure 7 in terms of trends in the student-teacher ratio for each of two student age groups. Specifically, the number of students per teaching position for the 3-5 age group declined from a ratio of 27.2:1 in 1989-90 to a ratio of 17.5:1 in 2000-01 (before increasing to 22.6:1 two years later). In contrast, the comparable ratio for the 6-21 age group held remarkably steady at close to 15:1 throughout the nine-year period studied. Thus, the shortage of teachers for students age 3-5 might be explained, in part, by efforts to reduce rapidly the student-teacher ratio, thereby putting
extraordinary pressure on sources of supply. But the same explanation does not apply to the shortage of teachers of students ages 6-21 since the student-teacher ratio was very stable at approximately the 15:1 ratio during the 16-year period examined.

The trends in Figures 6 and 7 clearly suggest a long term policy from 1989-90 to 2000-01 to accelerate the growth of teaching positions for students ages 3-5 in order to bring the ratio of students per teaching position for this age group more in line with that for students ages 6-21 years. Why this trend would seem to reverse in the two years following 2000-01 is not clear from these data, but it may be due (at least in part) to a particularly rapid increase in students age 3-5 from 2000-01 to 2002-03 (a two-year increase of about 80,000 students, as shown in Figure 2, representing an increase of over 13%). Whereas a substantial increase in the supply of teachers was needed to maintain or improve the ratio of students to teachers, the number of teachers seemed to level out during the years 1999-00 to 2002-03 (as discussed above with respect to Figure 1).
Trends in the Demand for Teachers in Special and General Education

The chronic and increasing shortage of fully certified teachers for students ages 6-21 with disabilities (as seen in Figure 5) might be explained, at least in part, by a rate of growth in teaching positions in special education that was much higher than in general education. If so, extraordinary increases in teacher demand in special education could more rapidly drain multiple sources of supply (such as the reserve pool) of qualified teachers. Evidence of the relative rates of expansion of teaching positions in special education (for students ages 6-21 years) versus general education (for students in grades K-12) is presented in Figure 8 for the 16-year period of this study.5 It appears that teaching positions in both special and general education expanded by similar percentages during the first 14 years of this period (27.7% for general education; 26.53% for special education). As happened in the first half of the 1990s, however, the expansion of teaching positions in special education increased at a higher rate during the two years following 1999-00. This expansion of teaching positions was most likely necessary to catch up partially with earlier increases in the numbers of students ages 6-21 (as seen in Figure 4). During the 10-year period from 1993-94 to 2002-03, the
number of students ages 6-21 increased by 26% while the number of their teachers increased by only 20%.

Since the teaching positions in special and general education expanded by comparable percent-ages through 1999-00, the shortage of teachers in special education cannot be attributed to extraor-dinarily rapid expansion of teaching positions (i.e., demand) in contrast with general education. In-stead, other evidence suggests that various sources of teacher supply were inadequate to satisfy the demand of fully certified SETs (e.g., Cook & Boe, in press).

**DISCUSSION**

Steady increases over time in the number of students with disabilities (both ages 3-5 and 6-21) have been associated with increases in the numbers of teaching positions, mostly filled with fully certified teachers. This represents a remarkable achievement by teacher preparation and professional development programs in special education to increase the supply of fully certified SETs. Nonetheless, the unmet demand for fully certified teachers also grew substantially. This represents a failure to satisfy the quality demand for a fully and appropriately certified teacher in every special education classroom.

During the two most recent years (2001-02 and 2002-03), three indicators demonstrate serious reversals in the teaching force for students ages 3-5: (a) the number of teaching positions may have started to decline in spite of continued growth in the number of students, (b) the percentage of not fully certified teachers (i.e., the shortage) increased sharply, and (c) the ratio of students to teachers began to increase. These reversals occurred in spite of gradual and considerable improvement in these indicators during prior years. Further research is needed to explain why these indicators of the teaching force for students ages 3-5 have deteriorated recently.

The trends in teachers for students ages 6-21 differed in important ways from those for students ages 3-5. The rate of growth in teaching positions has approximated the rate of growth in the number of students served. Since 1993-94, however, the shortage percentage of fully certified teachers for students age 6-21 increased substantially during the following ten-year period to 13.4% (54,200 teaching positions, including estimated vacant positions). This phenomenon has been described as the chronic and increasing shortage of SETs (Boe & Cook, in press), and represents a major chal-lenge to the field in generating an adequate supply of fully certified teachers in response to the de-mand. This shortage percentage (13.4%) compares unfavorably with that in general education
(10.5%), especially since special education has not been disadvantaged in having a higher rate of growth in teaching positions to be filled than in general education.

The increasing shortage of fully certified SETs represents a major challenge for policy and practice in special education relevant to developing and sustaining a qualified teaching force—the clear implication of which is that the field of special education should devote even more attention and resources to solve its teacher shortage problem. Although the trends in teacher demand, supply, and shortage examined in this study do not provide information specifically about which of many policies and practices should be used to address these shortages, the trends represent hard evidence that the problem is serious and has gradually increased during recent years.

Two broad approaches are relevant to addressing the shortage of over 54,000 fully certified teachers for students ages 6-21 with disabilities. One approach is to reduce teacher demand; the other is to increase supply. Four possible strategies to reduce demand are considered below: (a) improve retention of qualified SETs through reduced exit attrition and transfer to general education, (b) redesign the education process, such as by using technology or teacher aids more extensively, so that fewer SETs are needed, (c) reduce the number of students classified with disabilities, and (d) increase the proportion of instruction provided by GETs for students with disabilities.

In spite of advocacy for improved retention of teachers (e.g., National Commission on Teaching and America’s Future, 2003), annual attrition rates of teachers are no higher (and may well be lower) than such rates in other vocations (Boe, Cook, & Sunderland, 2005). Thus, leaving employment in a vocation is a common phenomenon, and the teaching profession is not disadvantaged in this respect. Of SETs who do leave teaching, only 37% do so to escape (i.e., actively want to leave for better jobs, etc.). Most leavers do so for personal reasons or to retire (Boe, et al.). Thus, well under half (about 7,000) of the approximately 20,000 SET leavers per year may potentially be impacted by policy initiatives intended to improve retention. If effective actions could be taken to make special education teaching sufficiently attractive to reduce escape leaving by half, then 3,500 of these would remain, thereby reducing the demand for about 54,200 fully certified SETs in 2002-03 by 6%. While this would not be trivial if all those retained were fully certified, other strong actions would also be needed to upgrade or replace the remaining 50,700 SETs who are not fully certified.

With respect to SETs who transfer to general education each year, there is an equivalent gain from GETs who transfer to special education. In addition, there is neither gain, nor loss, in the qualifications of teachers who transfer out of, and into, special education (Boe, et al., 2005). Furthermore, many SETs probably wish to transfer to general education because it is the field of their preparation.
Approximately one in five first-time SETs earned a major in an area of general education teacher preparation (Cook & Boe, in press). With 33,000 SETs transferring to general education following the 1999-00 school year, it is important to understand better the reasons why so many choose to transfer or are reassigned by administrative action.

Perhaps there is considerable potential for increased retention of SETs (i.e., both reduced numbers of SETs who leave to escape teaching and who switch to general education) through improved induction, professional development, and working conditions (Billingsley, 2005), but the effectiveness of interventions should be tested in the field. In addition, more needs to be known about the qualifications of SETs who escape from teaching and who transfer to general education. Preliminary evidence indicates that many are not highly qualified (Boe, et al., 2005) and therefore should not be retained in their positions unless their qualifications are upgraded.

Turning to other possible interventions for reducing the demand for fully certified SETs, little reduction may be expected through redesign of educational processes or reduction in the number of students classified with disabilities. Radical change in one or both of these interventions would be needed to reduce teacher demand substantially, but it is as unlikely in the near future, as it has been in the past. Incremental steps along these lines would reduce teacher demand only marginally. However, the Response to Intervention (RTI) initiative is a newly-identified process described in IDEA for identifying students with learning disabilities (National Association of State Directors of Special Education, 2005). This initiative holds promise for substantially reducing the number of students eligible of special education services (and therefore also reducing the demand for SETs) if it proves to be effective and can be scaled up nationally.

In 1998, OSEP hypothesized that the downturn in demand for teachers of students ages 6-21 observed during 1994-95 and 1995-96 “could be explained by increasing inclusion of students with disabilities into general education classrooms” (1998, p. III-8). However, this downturn in demand reversed the following year and the demand for teachers has since increased at a pace equivalent to that of increases in the number of students with disabilities.

Nonetheless, there has been a substantial increase in the inclusion of students with disabilities in general education classrooms during the period of 16 years examined in this study. As of 1987-88, 28.9% of students ages 6-21 were served outside the regular class less than 21% of the school day. By 2002-03, this percentage had increased substantially to 48.2% (OSEP, 2001, Table III-1; OSEP, 2005). The change in these percentages represent a 67% increase in this index of inclusion during the 16-year period—a number well in excess of the 42% increase in demand for teachers during the
same period of time. Nevertheless, the substantial gains made in inclusion were not associated with reduced demand for SETs, a demand that grew in proportion to increases in the numbers of students with disabilities. In the absence of a control condition, it is not possible to determine whether the demand for SETs may have grown even more had it not been for gains in inclusion. However, it is surprising that increasing inclusion was not associated with declining demand for SETs. The impact of inclusion on the demand for SETs is a prime topic for research.

Even if some reduction in demand for fully certified SETs is achieved, there is little reason to expect that the need for a much larger supply will be offset substantially in the foreseeable future. Therefore, enlarged teacher supply is needed to address the chronic and increasing shortage of over 50,000 fully certified teachers for students ages 6-21. Four possible strategies to increase supply are considered below: (a) increased transfer of qualified GETs to teaching positions in special education, (b) improved recruitment of qualified teachers entering from the reserve pool, (c) expansion of initiatives to upgrade the qualifications of unqualified employed SETs, and (d) expansion of teacher preparation programs in special education to increase the production of novice teachers.

Little is known about the potential for enhanced recruitment of GETs who are qualified for teaching in special education. There may be little potential for enhanced recruitment because an already large number of GETs transfer to special education. During the 1990s, approximately 25,000 GETs were recruited on an annual average basis into special education teaching positions, 22,000 of whom were fully certified in the positions into which they transferred (Boe, et al., 2005). This was not a net gain for special education, however, because it merely offset an equivalent loss of fully certified SETs to general education. More research is needed to examine the potential of cross-field teacher transfers for enhancing the supply of qualified SETs, and the effectiveness of actions that might be taken to make teaching in special education more attractive to GETs who are qualified to teach in special education.

With respect to reentering experienced teachers (the major component of the reserve pool), OSEP (1998) concluded that this source of entering teacher supply was rapidly becoming depleted (p. III-17). Fortunately, this did not occur as 42% of all entering SETs in 1999-00 had prior teaching experience (up from 33% in 1993-94) (Cook & Boe, in press). This percentage was virtually the same as the recruitment of reentering experienced teachers to general education. Overall, special education was as successful as general education in recruiting entering teachers from various sources of supply (Cook & Boe). Accordingly, enhancing the supply of SETs by even a higher level of recruitment from the reserve pool will probably be quite difficult without the creation of greater incen-
tives to enter special education teaching instead of general education. As is well known, the teaching profession has been very resistant to creating strong incentives (such as a different pay scale) to attract teachers to high shortage areas (either by subject matter, or school location).

In contrast, upgrading the qualifications of employed SETS represents a more promising approach to increasing supply of qualified teachers. Over 50,000 employed SETs nationally have not earned full certification in their main teaching assignment. However, they have demonstrated that they are able and willing to be employed in special education. Therefore, these teachers can be viewed, for the most part, as an asset worthy of further investment in upgrading their qualifications. This can be implemented by local education agencies through encouraging, supporting, and providing incentives for such teachers to complete alternative routes to certification (ARC) or to enroll part-time in traditional teacher preparation programs at local colleges and universities. Certainly many SETs improve their qualifications from year-to-year through these means, but nothing is known from national research about the extent to which teacher preparation programs are used for this purpose. Consequently, research is needed on the extent to which such programs upgrade the qualifications of employed SETs annually, and the potential benefits of their expansion.

The fourth approach to enlarging the supply of qualified SETs is to expand the production of novice teachers for special education (both by traditional and alternative routes to teacher preparation and certification). Although alternative routes to certification (ARC) for special education have been proliferating nationally in recent years, little is known in the aggregate about the number of completers produced annually or about their effectiveness as teachers (Rosenberg & Sindelar, 2005). Nonetheless, it is likely that ARC programs will produce increasing numbers of completers because it is the policy of USDE to encourage and support their development in order “to move candidates into the classroom on a fast-track basis” (USDE, 2002, p. 15).

Even though the former Secretary of Education recognized that traditional teacher preparation programs “will always produce a large percentage of our teachers” (Paige, 2004, p. v), federal encouragement and support has not been devoted to expansion of traditional university-based preparation leading both to degrees and teacher certification. The need for increased production of graduates by teacher preparation programs in special education has continued since OSEP’s (1998, Section III) review of options because the demand for SETs has steadily increased. This increased demand has occurred even though the production of graduates by traditional teacher preparation programs in special education has increased from 1991 through 1998 while the production of programs in general education has remained stable (Cook & Boe, in press). Nonetheless, the production of teacher
preparation programs in special education was still not enough to satisfy the demand for fully certified SETs. Regrettably, the production of new graduates (at both the bachelor’s and master’s degree levels) has gradually declined since 1998 (Cook & Boe). In the absence of federal initiatives, the responsibility for reversing this trend, and for expanding further the production of degree graduates in special education teaching, will continue to reside with the states in their support of teacher education programs in colleges and universities. Unless the decline in the production of graduates from teacher preparation programs in special education is not only reversed, but increased substantially, it is likely that the shortage of qualified SETs will continue to increase, not only in numbers but as a percentage of the teaching force in special education.

None of the strategies for reducing the demand for, or increasing the supply of, qualified SETs will be easy, or surely such actions would already have been taken. The shortage of sufficient numbers of qualified SETs to serve children with disabilities has been an intractable problem for decades that will require concerted effort and substantial resources to ameliorate. The field of special education has responded most dramatically in recent years by ramping up the production of teachers by alternative means. At the same time, however, the field has allowed the production of teachers by traditional means to decline. A similar ramping up of the production of teachers by traditional means would reduce the shortage substantially. Given what is known about difficulties in reducing the demand for qualified SETs, strategies to increase their supply would seem to hold more promise for enhancing the qualifications of teachers in special education.
ENDNOTES

1 Demand thus defined is also be referred to as the "total demand" for teachers to distinguish it from the "annual demand" for individuals to be hired as newly employed teachers each year to fill open positions. This distinction will be used later in this paper.

2 Teacher certification is the most basic qualification established for teachers. While there are other important dimensions of teacher quality (Kennedy, 1992; Carlson, Lee, Schroll, Klein, & Willing, 2002), the most readily available national information on the qualifications of SETs is their certification status for the positions to which they are assigned. For these reasons, only the certification dimension of teacher quality is considered here.

3 See Figure 7 for trends in student-teacher ratios during 16 years.

4 The annual demand for "entering teacher hires" refers to open teaching positions that are not filled by employed teachers who continue from one year to the next, even though many switch positions between school years. For example, thousands of general education teachers switch to special education each year to fill open positions. The remaining open positions in special education need to be filled by individuals entering the employed teaching force each year, thereby filling the annual demand for "entering teacher hires."

5 To obtain the number of full-time equivalent teaching positions in general education, the number of full-time equivalent teaching positions in special education (as recorded by DANS) were subtracted from the number of full-time equivalent teaching positions in all teaching fields in grades K-12 as recorded by the Common Core of Data of NCES (Snyder & Hoffman, 2003)
REFERENCES


