Effectiveness of Special Education: Is Placement the Critical Factor?

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Abstract

Research indicates that various program models, implemented both in special education and general education, can have moderately positive academic and social impacts for students with disabilities. However, no intervention has been designed that eliminates the impact of having a disability. With few exceptions, students with disabilities have not achieved commensurately with their nondisabled peers; even students with learning disabilities as a group have not been able to achieve at the level of low-achieving nondisabled students.

In general, the most effective interventions for students with disabilities, whether in special education or general education settings, have employed intensive and reasonably individualized instruction, combined with careful, frequent monitoring of student progress.

There is no compelling evidence that placement rather than instruction is the critical factor in student academic or social success. Further, studies have indicated that typical practice in general education is substantially different from practice in the model programs that showed greatest success for students with disabilities. The interventions that were effective in improving academic outcomes for students with disabilities required a considerable investment of resources, including time and effort, as well as extensive support for teachers.

The research does not support full-time inclusion for all students with disabilities. On the contrary, it appears that there is a clear need for special education. At the same time, given adequate resources, schools should be able to assist more students to be more successful in general education settings.

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Recently, both *The Wall Street Journal* ("Special Ed's Special Costs")[1] and *U.S. News and World Report* ("Separate and Unequal: How Special Education Programs Are Cheating Our Children and Costing Taxpayers Billions Each Year")[2] accused special education of being costly, ineffective, and perhaps even immoral (for example, it promotes

"segregation"). As noted by Fuchs and Fuchs,[3] such articles in the media echo criticisms by some professionals in the field. Critics of current practices propose either a substantial decrease in or elimination of special education altogether so that students with disabilities will be taught in general education classes. This movement is called "inclusion," and it is controversial because of its emphasis on placement, that is, the classroom to which a student is assigned rather than what happens in that classroom.

The purpose of this article is to review research conducted since 1980 which is directly relevant to inclusion, including research on the effectiveness of special education in general. The majority of the research reviewed here was funded by the Office of Special Education Programs (OSEP) in the U.S. Department of Education. Selected older studies will be referenced as appropriate. Efficacy of interventions is assessed in terms of either academic progress or improved social-behavioral skills for students with disabilities.

Overall, many models in both the special education and the general education classroom show moderate academic and social improvement for some special education students, though improvements have not been uniform or dramatic. Virtually all interventions showing positive impacts involved considerable additional resources.

This article has four major sections. First, basic information about definitions, current student placements, and positions taken by various constituencies is presented. Second, data are provided regarding what typically happens in the general education classroom and in the special education classroom, emphasizing features salient to the needs of special education students.

Third, data about outcomes for special education students are summarized. Although various interventions can have some positive impact on academic and social outcomes, no intervention reliably improves special education student performance to the level of nondisabled students. The more effective interventions have employed an intensive and reasonably individualized approach to student instruction, combined with frequent monitoring of student progress.

Fourth, interventions designed to facilitate inclusion of special education students in the general classroom are considered. The research does not support inclusion for all students with disabilities. At the same time, the research indicates that, given adequate resources, schools should be able to assist more students to be more successful in general education.

Current Placement and Constituent Groups

To understand the relationship between special education and general education, one must know the definitions of key terms, be aware of where special education students currently spend the school day, and understand the positions taken by various constituencies (including teachers, school boards, parents, and advocacy groups for the disabled) on the question of how placement should be determined for students with disabilities.

Definitions: "Mainstreaming" and "Inclusion"

Both mainstreaming and inclusion are concepts and movements, rather than precisely defined programs. Within this article, main-

Box 1

Full Continuum of Educational Services and Student Placement

Level I	Attendance in general education class, without supplementary instructional supports, and with or without medical supports
Level II	Attendance in general education class with supplementary instructional services delivered in the general classroom
Level III	Part-time attendance in resource room
Level IV	Full-time attendance in special education class
Level V	Special schools
Level VI	Homebound instruction
Level VII	Instruction in hospital or domiciled settings

Source: Deno, E. Special education as developmental capital. *Exceptional Children* (1970) 37:229–37. With modifications by A. Hocutt for this publication. Originally termed the "cascade of services."

streaming and inclusion will be defined as described below.

"Mainstreaming" is the integration of children with disabilities with their peers in general education based on individual assessment. The term is associated with the least restrictive environment (LRE) mandate in the Individuals with Disabilities Act (IDEA) and with the "full continuum of services"[4] (see Box 1). That is, mainstreaming occurs when an interdisciplinary team (including parents) determines that, given all available placement options, a specific child should participate in general education for some part of the school day.

"Inclusion" goes beyond mainstreaming in that it implies that most children with disabilities will be educated in the general education classroom for most, if not all, of the school day. "Full inclusion" means that *all* children with disabilities, regardless of the nature or severity of the disability, will be educated in general education: in a full inclusion system, separate special education placements would no longer exist. Both inclusion and full inclusion imply that other placement options would be severely curtailed or abolished.

Current Placement Patterns

Data from the most recent annual report to Congress[5] of the Office of Special Education Programs (OSEP) show that a variety of placements are used (see Figure 1). The percentage of students with disabilities served in the various placements has changed very little over the past decade.[6] Approximately one-third of special education students spend 80% or more of their school day in the general education classroom. Another one-third spend 40% to 79% of their day in general education. Approximately one-quarter spend 0% to 39% of their time in general education, but their special education classrooms share a building with the general education classes. The remaining 5% to 6% of special education students are served in separate schools, residential programs, hospitals, or their own homes.

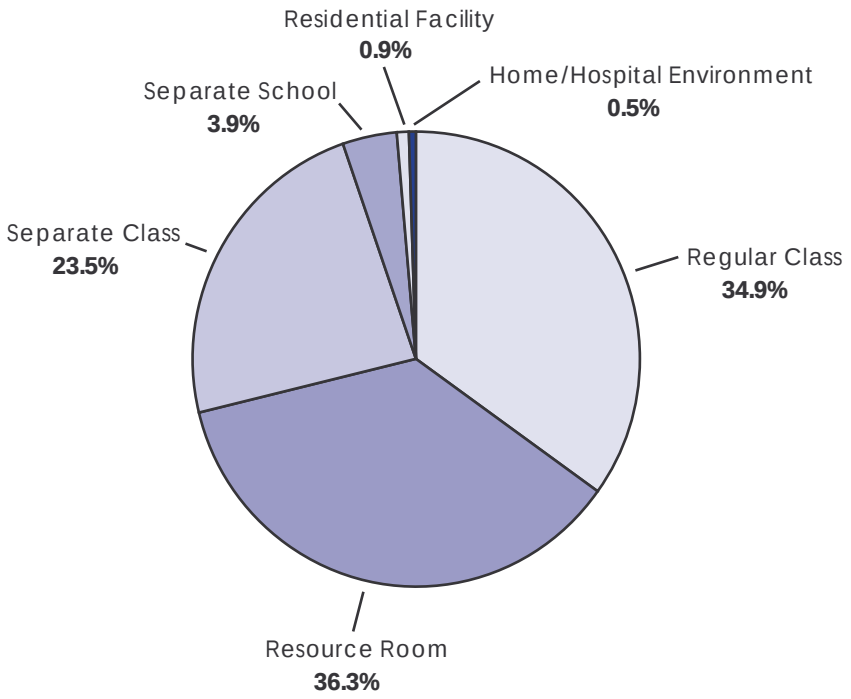
Positions on Inclusion

Many constituencies, representing people with widely differing disabilities, as well as professional organizations of teachers, school administrators, and professionals who work with students with disabilities, have issued position statements on inclusion through their professional or advocacy organizations. These positions have been categorized as follows:[7]

- unqualified enthusiasm for full inclusion and elimination of the continuum of special education services;[8]
- enthusiasm for the philosophy of inclusion but support for the continuum of ser-

Figure 1

Percentage of All Students Ages 6 through 21 with Disabilities Served in Six Educational Environments During the 1991–92 School Year



- **Regular Class** includes students who receive the majority of their education program in a regular classroom and receive special education and related services outside the regular classroom for less than 21% of the school day.
- **Resource Room** includes students who receive special education and related services outside the regular classroom for at least 21% but no more than 60% of the school day.
- **Separate Class** includes students who receive special education and related services outside the regular classroom for more than 60% of the school day.
- **Separate School** includes students who receive special education and related services in separate day schools for students with disabilities.
- **Residential Facility** includes students who receive education in a public or private residential facility at public expense.
- **Home/Hospital Environment** includes students placed in and receiving special education in hospital or homebound programs.

Source: Office of Special Education Programs. *Implementation of the Individuals with Disabilities Education Act: Sixteenth annual report to Congress.* Washington, DC: U.S. Department of Education, 1994, p. 12.

vices and individual decision making;[9,10]
- reduction of the special education system in size;[11]
- support for "appropriate" (individually determined) inclusion, including a full continuum of placement options and services;[12]
- concern that inclusion does not provide appropriate services for students with learning disabilities, vision impairment/blindness, or hard-of-hearing/deafness;[13–18] and
- concern about responsibilities of general education teachers and effects of inclusion on all students,[19] with recognition that diversity of placement options and teaching approaches is a strength of the current system.[20]

Experiences of Children in General and Special Education

To answer the question "What's 'special' about special education,"[3] it is necessary to compare special education with general education (see Box 2). This section summarizes OSEP-funded research, including: (1) descriptive studies of general education; (2) descriptive studies and data about special education; and (3) student outcomes.

Common Practices in General Education

Recent studies have described typical practice in general education, emphasizing those factors that are critical for students with disabilities, such as classroom instruction, teacher attitudes and referral decisions, and schoolwide issues. The results of these studies apply to all grades unless otherwise noted.

Classroom Instruction

Numerous practices in the typical general education classroom conflict with known effective interventions for students with special learning needs. Undifferentiated large-group instruction appears to be the norm in general education.[21] Individual assignments, small-group work, and student pairing occur, but much less frequently than whole-class instruction.[21,22] Teachers typically follow the sequence of lessons outlined in teachers' manuals[21] and focus on content coverage.[22] Students with disabilities in these classes may be expected to cover the same content at the same pace as nondisabled students.[22]

Middle and high school teachers monitor the work of nondisabled students at higher rates than they do the work of students with disabilities.[22] Research suggests that teachers are more concerned about whether students demonstrate interest in a lesson and do not create discipline problems than they are about whether a particular student experiences difficulty learning.[22]

Research also indicates that general educators do not usually adapt lesson plans in response to individual student confusion or low achievement.[21,23] When surveyed, teachers do not perceive themselves as having the skill for adapting instruction in ways that facilitate individual or small-group instruction.[24] When teachers modify instruction, they may be more likely to make adaptations (for example, providing reinforcement and encouragement, establishing appropriate routines, and adapting classroom management activities and/or test situations) that do not require preplanning.[22,25] They may be less likely to develop individual objectives, adapt curricular materials, use alternative materials, and/or adjust scoring and grading criteria for individual students.[22]

From 3% to 5% of the school-age population is referred in any given year, 92% of those referred are tested, and 74% of those tested are placed in special education.

Teacher Attitudes and Referral Decisions

The decision by the general education teacher to refer a given student for possible placement in special education is critical. In general, from 3% to 5% of the school-age population is referred in any given year, 92% of those referred are tested, and 74% of those tested are placed in special education.[26,27] There may be biases in teacher referrals: males and African-American students are referred more often than other students.[28] However, referred students have considerably lower reading achievement than those who are not referred.[28]

In deciding which children to refer for possible placement in special education, research shows that teachers consider their

Box 2

How Special Education Differs from General Education

The following are broad conclusions drawn from descriptive studies of classroom conditions and from surveys of teacher attitudes and practices. However, many classrooms and teachers may differ because of local conditions and practices.

General Education

- ***Class size:*** Average class size is larger (24 elementary, 21 high school) than in special education (15).
- ***Teacher training:*** Teachers' preservice training is likely to focus either on content (for example, history or math) or on a developmental stage (for example, kindergarten). General educators may have received an introductory course describing children with special needs, resulting in limited information about and limited opportunity to practice teaching techniques effective in meeting special needs. Such courses have been called "inherently superficial" by the National Association of State Boards of Education Study Group on Special Education.[a]
- ***Accountability:*** Teachers are working in a climate of higher standards and raised expectations. They are expected to cover a set curriculum over the course of the year, raise student test scores, and maintain order in the classroom.
- ***Classroom practices:*** Common practices are those which support average learners. Large-group instruction is the norm, although individual and small-group assignments also occur.
- Monitoring of students involves brief informal checking on what students are doing (as opposed to extended observations and data collection), with limited direct feedback to students (as opposed to extended, frequent one-on-one feedback about student progress).
- When surveyed, teachers report lack of training to adapt the curriculum to individual students' special needs. They may be reluctant to adjust scoring and grading criteria for individual students.
- Disruptive student behavior is a major concern of teachers (many would prefer to have disruptive students removed from the class). Further, when observed, teachers demonstrate a limited range of techniques to modify disruptive behavior.
- Students do not generally receive instruction to help them acquire appropriate behaviors or social skills.
- Teachers who have the greatest success at raising the academic achievement of the whole class may also have the least tolerance for students with impaired skills or with maladaptive behavior.

Special Education

- ***Class size:*** Average class size (15) is smaller than in general education.
- ***Teacher training:*** Teachers are somewhat more likely to have advanced degrees. However, because of personnel shortages nationwide, about 10% of special education personnel are not certified for the position they hold.[b]
- ***Accountability:*** Each student in special education has an individualized education program (IEP), and teachers are expected to help each student advance toward his or her individual goals.
- ***Classroom practices:*** A minority of studies have found few differences between general and special education in terms of instructional practices. However, the majority of studies have found differences, summarized below.
- Special education teachers are likely to use a wider variety of teaching strategies.
- Special education teachers are also more likely to monitor student behavior frequently, praise students, and provide answers to their own questions if student response is inadequate.
- Special education teachers collect more data to monitor student progress and are more knowledgeable about individual students.
- Materials are covered at a slower pace.
- Teachers have a wider repertoire of responses to manage students' disruptive behavior or inattention.

[a] National Association of State Boards of Education. *Winners all: A call for inclusive schools.* The report of the NASBE Study Group on Special Education. Alexandria, VA: NASBE, October 1992, p. 25.

[b] Office of Special Education Programs. *Implementation of the Individuals with Disabilities Education Act: Sixteenth annual report to Congress.* Washington, DC: U.S. Department of Education, 1994, p. 20.

perception of the child's "teachability," the overall diversity of the classroom, and the philosophy and policies of the school district. Research also suggests that some teachers who are most effective at raising overall academic standards may have a *lower* tolerance for students with special needs.

■ *Student Teachability.* "Teachability" refers to the extent to which a student is alert, sustains attention in the classroom, and begins and completes work on time. A teacher's perception of a student's teachability plays a major role in the decision to refer.[28,29] Other child characteristics that are related to this decision include language difficulties[26,30] and behavioral problems, particularly aggression, opposition, and hostility.[26,29] General education teachers will not tolerate disruptive and/or dangerous behavior.[25,31]

■ *Classroom Diversity.* General education instruction appears to be aimed at a relatively homogeneous group of students as teachers try to reduce "the sheer cognitive complexity of planning and instruction associated with broad ranges of student characteristics and abilities."[29] Thus, teachers refer difficult-to-teach children who have serious academic and behavioral problems[28] and who are markedly different from other students in the class.[32] Not surprisingly, many teachers are skeptical of proposals to return all children with disabilities to general education classrooms because coping with the difficulties these children present may take time the teacher now uses for instruction.[33]

■ *School District Factors.* Teachers refer at different rates depending partly upon contextual factors such as sources of available assistance,[29] the way in which the teacher is evaluated by administrators, the restrictiveness of special education eligibility criteria used in the school district, and district requirements regarding prereferral intervention.[26]

■ *Classroom Environment.* A child's school failure and likelihood of being referred to special education are influenced not only by the child's own characteristics, but also by the manner in which the classroom operates. Research suggests that the classroom environment most conducive to school failure is one in which a student in academic trouble does individual seatwork while the teacher engages other children in the class in small-group work. Students engaged in individual seatwork receive minimal assistance or corrective feedback while working, increasing the likelihood of failure and consequent referral.[30]

■ *Effective Teachers and Special Education Referrals.* Researchers[34] have found effective teaching behaviors to include: reviewing and checking the previous day's work, and reteaching if necessary; promoting initial student practice of new content and skills, and checking for understanding; providing corrective feedback; giving students an opportunity for independent practice; and conducting weekly and monthly reviews of progress. In theory, such close monitoring and feedback-intensive practice should be well suited to the needs of special education students, as well as to the needs of the general student body. Unfortunately, research on teacher attitudes suggests that some effective teachers may not be willing to accept students with disabilities.[35,36]

Teachers who are most effective at raising overall academic standards are likely to have a* lower *tolerance for students with special needs.

For instance, data from one study[34] showed that elementary general education teachers who were considered most effective were also the least likely to accept students with maladaptive behavior or disabilities into their classroom, and those teachers had a lower sense of responsibility for dealing with students' problem behaviors. Data from two other studies indicated that teachers with the most effective instructional and classroom management techniques had the lowest tolerance for maladaptive behavior and the highest expectations for behavior and achievement, and would be most likely to resist placement of a disabled student in their classroom,[35] especially if the student were deficient in self-help skills, required adapted materials, or had impaired language ability.[36]

Schools and School Systems

The description of general education to this point has focused on classroom instruction

and on reasons teachers refer students for special education. However, research also describes the context in which schools and school systems operate.

■ *Schools' Capacity for Teaching Behavior Management Skills.* Many students with disabilities have very poor social skills, and some have behavioral and/or emotional disorders. Public schools often do not address social skills, and teachers have not been trained to use positive behavior management strategies rather than punishment. Mental health and other services are usually not available or, if available, are not integrated into the regular program.[37]

■ *Higher Standards for Academic Performance.* Further, schools and school systems are operating in a climate of increased accountability.[38] Many reports and studies have accused the U.S. educational system of being mediocre.[38] These reports have resulted in a national drive for excellence in education, generally interpreted as higher standards, more courses, and more homework. The focus is now on student outcomes, for example, higher scores on tests and increased high school graduation rates. Some states are using enrollments in advanced courses, the amount of homework given or completed, and SAT scores as measures of school performance. These raised expectations occur in a climate of large classes and large teacher loads (for example, 150 students per day per teacher in secondary education).[38] Consequently, it is not surprising that many special educators doubt that general education will be able to successfully educate more students with disabilities for more hours during the school day.[39]

Approximately 95% of special education students are educated in the public schools; these students spend an average of 70% of their time in general education settings.

Common Practices in Special Education

Current data from the U.S. Department of Education show that class size in special education averages 15 students per teacher,[5] smaller than typical general education ratios. Small classes facilitate more individual attention and small-group instruction. Also, more special education teachers have advanced degrees, with nearly 55% having a master's degree and 11% having an educational specialist or doctoral degree in comparison with 40% and 6%, respectively, for general education teachers.[3] The special education curriculum is more oriented toward the development of functional skills, and the pace at which students cover materials is slower.[40]

As noted earlier, approximately 95% of special education students are educated in the public schools; these students spend an average of 70% of their time in general education settings[5] (see Figure 1). Younger students are more likely than older students to be placed in integrated settings (that is, settings which have both general and special education students).[5]

Comparison of Instruction in General and Special Education

Although a majority of studies comparing instruction in general and special education have found numerous differences, a minority of studies have found few differences. For instance, one study comparing special education, resource-room instruction with typical classroom instruction in reading and math found no significant differences in a variety of instructional practices, including teacher modeling, opportunity for student responses, amount of guided and independent practice, and pacing of lessons.[41] Other studies have indicated that general and special education teachers perform similar instructional tasks.[42,43]

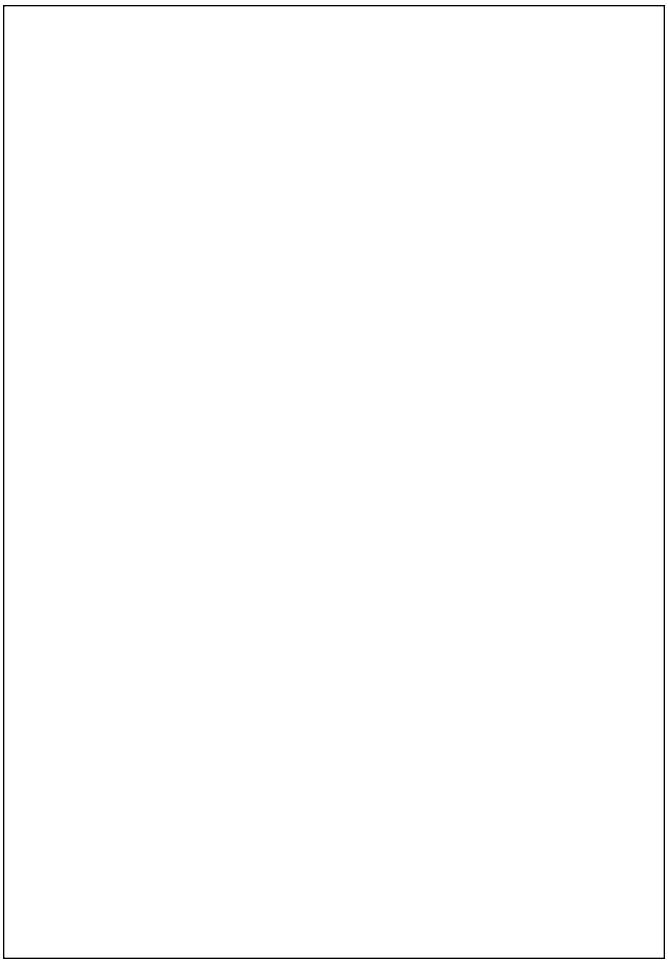
Teaching Strategies and Interventions

For the most part, research shows differences between general and special education instruction, though findings have not been consistent across studies. Some comparison studies have focused on the differences in the teaching strategies and interventions used by general and special education teachers, and this literature consistently shows differences. One study, which compared teacher planning and adaptation for students with learning disabilities, found that general educators preferred to use manipulative and audiovisual activities, while the special educators preferred detailed intervention programs designed for

special education students, for example, direct instruction and cognitive strategy instructions.[44] (Direct instruction and cognitive strategy instructions are described later in this article, in the section on inclusion efforts.) Another study of instruction for children with educable mental retardation (EMR) in general and special settings found that special educators showed more flexibility in selecting strategies with which to manage and monitor the classroom.[42]

Teacher Monitoring of Student Progress

The research comparing teacher monitoring of student progress is also consistent in showing that general and special education teachers approach this task differently. General education teachers prefer to determine progress or success through informal observations in the classrooms; when tests are involved, they prefer tests directly based on material taught (as opposed to standardized tests such as the California Achievement Test).[44] On the other hand, special educators are generally more data-based.[42,45] Further, with smaller classes, special education teachers can be more knowledgeable about their students and can tailor educational programs for specific students.[42]



Student-Teacher Interaction

With regard to student-teacher interaction in the two settings, results are somewhat inconsistent. One study, which compared the interactions of students with learning disabilities with a group of nondisabled students in general education classes, found that the students with learning disabilities had more interaction with the teachers, but that the teachers asked academic questions and provided feedback more to the students without disabilities.[46] Other researchers have found that the proportion of exchanges focused on academic content is greater in special than in general education.[44,47]

A study of beginning general and special education teachers also found that special educators monitored and praised their students with learning disabilities more than did general educators. During teacher-initiated interactions, the special educators were more likely to provide more answers to their own questions and less likely to ignore students' inattention or disruptive behaviors.[48] A follow-up study[49] with different general and special education teachers produced similar findings.

Effective Teaching Literature

Some studies comparing instruction in general and special education come from the effective teaching literature. Advocates for inclusion have often cited this literature because they assume that students with mild handicaps are essentially the same as low achievers and will respond well to the same interventions that have been effective with low-achieving students.[50] This is a controversial assumption because recent research indicates that there are differences in brain structure and functioning between children with dyslexia (a common learning disability) and other children and that there is a biological and possibly genetic factor in some reading disabilities. (See the article by Lyon in this journal issue.)

One study compared instructional behaviors of general and special education

teachers from the perspective of the effective teaching literature to identify behaviors that differentiated teachers whose students had high and low proportions of on-task behavior. Overall, special education teachers were more likely than general educators to monitor student behavior, praise, show positive regard, give the answer, and reject students' verbalizations. More effective general and special education teachers had materials ready, began lessons promptly, oriented learners to the lesson, made assignments more often, exhibited more teacher-directed than student-directed learning, praised student responses more, and had to manage student inattention/disruption less often.[49]

Schools routinely exclude special education students from schoolwide standardized testing.

It appears that differences in instruction between general and special education teachers are common. Some of these differences may be a function of smaller class sizes; others may be related to teachers' professional training. Given the existence of these differences, it is reasonable to ask whether outcomes for students with disabilities are determined more by the setting in which they are educated or by what happens in that setting.

Outcomes in Special Education

Outcomes for students in special education are highly variable, reflecting the great diversity in the nature, degree, and co-occurrence of disabilities experienced by individual students. Three points are made in the following discussion: (1) much of the research on the effectiveness of special education is characterized by methodological problems; (2) the studies that have most strongly criticized special education, and are commonly cited by inclusion advocates, are somewhat outdated; and (3) studies of the effectiveness of special education can best be interpreted by grouping students with different types of disabilities, as summarized in Box 3.

Caveats Concerning Research

Studies of outcomes for special education students under various conditions are often characterized by methodological problems. Sample sizes are frequently small. Random assignment is rare because it would violate the student's IDEA guarantee of individually determined appropriate interventions. (See the article by Martin and Martin in this journal issue.) Further, comparison groups are unlikely to be truly comparable because students who are educated in more restrictive settings are likely to differ from other students in important but unmeasured ways, such as exhibiting more disruptive behavior.

The appropriateness of the measuring instruments used in many older studies of the efficacy of special education has been criticized. Because the progress of some students with disabilities is slow, the effects of an intervention in a small sample might be too small to be picked up by a standardized test.[51] Further, studies reported in grade-equivalent scores can seriously exaggerate a student's progress or lack of progress.[52]

In addition, most school systems and state departments of education do not accumulate information on the academic achievement of students in special education. With few exceptions, schools routinely exclude special education students from schoolwide standardized testing.

Finally, outcome research in special education is commonly conducted by university-based researchers (including this author) who also design and supervise the implementation of the intervention in question, frequently providing substantial support to the classroom teacher. This degree of support is unlikely to exist in typical practice.

With these caveats, studies of outcomes for special education students under various conditions are reviewed in this section.

Older Studies Cited by Advocates

Proponents of inclusion frequently cite some older studies of the efficacy of special education as proof that special education does not work;[53] however, this conclusion oversimplifies the results of these studies. In fact, this body of research should be viewed with caution.

Box 3

Factors Affecting Outcomes for Special Education Students

- ***Student academic and social success*** is affected more by the instructional models employed and the classroom environment than by placement in general or special education.
- ***Students with learning disabilities (LD)*** perform slightly better and think of themselves as more competent academically when placed in special education.
- ***Students with severe emotional disturbance (SED)*** are more likely to succeed in general education if they take part in vocational education and are integrated into the school, for example, through sports participation. However, students with SED who have a history of course failure may be more likely to drop out of school if placed in general education.
- ***Students with hearing impairments*** appear to gain some academic advantage but suffer some loss of self-concept when placed in general education. The strength of the child's auditory and oral skills is a critical determinant of success in general education. On average, hard-of-hearing students do not perform as well academically as normally hearing students in any setting, and the gap in performance increases with age.
- ***Students with educable mental retardation (EMR),*** usually defined as having an IQ between 70 and 50 combined with deficits in adaptive behavior, appear to be particularly sensitive to classroom environment. A supportive teacher, instruction style, and classmates have a greater impact on outcomes for these students than for students without disabilities.
- ***Students with severe mental disabilities,*** usually with IQs below 50, typically have greater social integration as a primary goal. Programs providing supportive transitional services have been successful at avoiding placements in residential settings.
- ***Nondisabled students*** do not appear to be impacted by the inclusion in general education of students with learning disabilities, mild behavior disorders, or severe mental disabilities, as long as supportive services are provided. When the inclusion program brings a lower overall teacher-student ratio to the classroom, the nondisabled students are likely to benefit academically.
- ***Effective schools*** appear to be more likely to benefit nondisabled low achievers than to benefit special education students. Outcome data for students with disabilities in identified effective schools are inconclusive.

It should be noted that these older studies were done so long ago that their relevance to today's classroom practices and student characteristics is questionable.[54] There have been historical changes in such classifications as educable mental retardation (EMR), so that results of older efficacy studies of students with EMR may not be generalizable to the current population of students with EMR.[55]

Both Carlberg and Kavale[56] and Wang and Baker[57] conducted meta-analyses of a number of efficacy studies comparing general versus special class placement. Carlberg and Kavale,[56] who examined the results of 50 studies, found that placement in general rather than special education classes resulted in better outcomes for students with mild retardation but poorer outcomes for students with learning disabilities or behavioral/emotional problems. Similarly, Wang and Baker,[57] who meta-analyzed 11 studies, concluded that placement in special education worked best for students with hearing impairments and worked well for students with mild retardation; however, it was not successful for students with learning disabilities. (It should be noted that Wang and Baker analyzed outcomes for students with hearing impairments only in terms of attitudes toward school and toward other students. They analyzed outcomes for students with mild retardation primarily in terms of attitudes, but measured outcomes for learning disabled students in terms of academic performance.)

Other researchers reviewed studies of outcomes associated with various types of placements. One review of the research literature[58] reached the same conclusion as Carlberg and Kavale, that is, that students with learning disabilities or emotional/behavioral problems were better off in special education resource rooms than in

general education classrooms. A second review[59] found "weak evidence" of improved educational and emotional outcomes in less restrictive environments, although these reviewers, as well as the authors of a third review,[52] stated that the intervention itself, rather than the setting in which it is implemented, is related to student academic progress.

Although these older meta-analyses and literature reviews are still presented as evidence that special education is ineffective, in fact the authors of the meta-analyses concluded that special education was preferable for students with learning disabilities or emotional disorders. It is also important to remember that the research on which these studies are based cannot be assumed to reflect current teaching practices and current student populations.

Generalized efforts to improve instruction for all students may do little to meet the special academic needs of students with disabilities.

Recent Studies of Outcomes in Special Education and in Effective Schools

First, this section examines outcomes for students with specific disabilities (summarized in Box 3). Then, this section considers studies of students without disabilities when students with disabilities are included in the classroom, concluding that no negative impacts have been indicated, though the research base is small. Finally, a discussion of generalized efforts to improve instruction for all students (the "school effectiveness" movement) concludes that improving the effectiveness of schools may do little to meet the special academic needs of students with disabilities.

Effectiveness of Special Education for Students with Disabilities

It is not possible to reach broad conclusions about all students with disabilities, and even within groupings, caution should be exercised. Distinctions between categories of disability are not absolute. Within categories, there is a wide range of severity, with and without co-occurring conditions.

Though caution is appropriate, it is necessary to consider some broad groupings of students with somewhat similar conditions to understand their needs and the services they require.

■ *Students with Learning Disabilities.* Students with learning disabilities (LD) constitute the largest single category of children with disabilities. (See the Child Indicators article by Lewit and Baker in this journal issue.) In general, studies conducted since 1980 indicate slightly better academic outcomes for students with learning disabilities who are served in special education settings. When these same students are served in general education settings, they have poorer self-concepts. The latter finding may be related to data showing that students with learning disabilities have one of the highest dropout rates of any group of students with disabilities. (See the article by Wagner and Blackorby in this journal issue.)

Special education settings appear to be superior in two recent studies,[60,61] which compared academic outcomes for students with learning disabilities who were placed at different times in general and special education settings. A time-series analysis allowed researchers to compare the performance of the same students in each of the settings. One study[60] of 11 poor readers who subsequently were diagnosed as having learning disabilities showed that these students gained nearly twice as many new reading words per week in special education as they had in general education. A separate study[61] of 21 students with learning disabilities who had been in special education classes and returned to general education showed that the students made small but steady gains while in special education, but made no gains in general education.

While most research on the performance of students with learning disabilities has taken place in elementary schools, some has been done at the high school level. A study[62] comparing the performance of secondary students with learning disabilities and their low-achieving nondisabled peers found that ninth-grade students with learning disabilities who were taught in general

education had an average grade point average (GPA) of 0.99, significantly lower than the already low 1.38 GPA of the nondisabled students who were classified as low achieving. Additionally, 20% of the students with learning disabilities failed the ninth grade; during their ninth-grade year, 79% earned a D or less in social studies, 69% earned a D or less in science, and 63% earned a D or less in health. These results corroborate earlier studies[23,63] showing that most secondary students with learning disabilities pass their classwork, although one study[23] indicated that general educators give students with learning disabilities a grade of D simply for attending class. Thus, it is not known how much actual learning was taking place, but it is clear the students with learning disabilities placed in general education were not achieving even at the level of nondisabled, low-achieving students.

Research suggests that the self-concept of students with learning disabilities improves the most in the most segregated settings, despite the assertion by some proponents of inclusion that children with mild handicaps will improve in their self-perceptions when placed full time in general education.[64] Various studies have found that (1) children with learning disabilities in general education classes had significantly poorer self-perceptions of academic competence and behavior than their nondisabled classmates,[65] (2) students with learning disabilities who spent part of the day in resource room programs thought of themselves as more competent academically than did similar students who spent all day in general classes,[66] and (3) the self-concept of students with learning disabilities who spent all day in special education classes was higher than that of similar students who spent one or two hours per day in special education resource classes.[67]

■ *Students with Emotional/Behavioral Disorders and/or Serious Emotional Disturbance.* As noted earlier, research consistently finds that general education teachers will not tolerate disruptive, aggressive, oppositional, defiant, or dangerous behaviors.[68] Both elementary and secondary teachers are concerned that students follow classroom rules, listen to and comply with teacher directives, and carry out decisions—in short, behave in an orderly fashion. By definition, students with emotional/behavioral disorders (EBD) or serious emotional disturbance (SED) have significant difficulty in these areas.

An article describing the characteristics and outcomes of children with serious emotional disturbance appeared in the summer/fall 1995 issue of this journal.[69] The author concluded that improved long-term outcomes (employment, postschool education, and residential independence) for students with serious emotional disturbance were associated with parental involvement, vocational education, and social integration into the school through participation in sports or other groups. Another critical factor was appropriate placement: higher-functioning students with serious emotional disturbance benefitted socially and held constant in academic achievement when returned to general education. However, lower-functioning students (those with more course failures) were more likely to drop out of school altogether when placed in general education.

Lower functioning students (those with more course failures) were more likely to drop out of school altogether when placed in general education.

Students with serious emotional disturbance who have the most severe problems may be taught in a separate school or residential treatment program. Logically, these students are more likely to be accepted in a less restrictive environment if teachers in both the special and general schools are able to devote time and resources to planning and carrying out the transition.

That, indeed, was the finding of one recent study involving the resource-intensive reintegration of 10 students with emotional/behavioral disorders from a self-contained day school into neighborhood schools.[70] The intervention consisted of 18 weeks of planning and intervention. Research staff spent an average of 20 hours per week for 18 weeks working with school personnel, while special and general education teachers spent 10 and 8 hours, respectively, on transition activities. This

intensive use of resources appeared to be effective. One of the 10 students entered a mainstream class, while the other 9 were placed in special education classes in the public school. Only 5 students in a comparison group of 10 EBD students were reintegrated into public school settings. The students who received the intervention were considerably more positive about their adjustment in the public school, and the behavior of the comparison students was more disruptive in the public school than that of the students who received supportive interventions.

■ *Students with Attention-Deficit Hyperactivity Disorder.* Children identified as having attention-deficit hyperactivity disorder (ADHD) have behavioral problems involving poor impulse control, attention deficits, and sometimes hyperactivity. A diagnosis of ADHD does not by itself make a student eligible for special education, though some of these children qualify under one or more of the disability categories spelled out in the IDEA. While children with ADHD may or may not be considered disabled under the IDEA, they often show improved behavior in school if they receive medication as prescribed by a physician. A review[71] of research on the use of stimulants (for example, Ritalin) on children identified as having ADHD, suggests that stimulants are successful in the temporary management of hyperactivity, inattention, impulsivity, aggression, social interactions, and academic productivity. However, there is no evidence to indicate that significant improvement of reading skills, social skills, learning, or of achievement results from medication.

The use of cooperative learning approaches promoted students' frequent interaction with nonhandicapped peers.

■ *Students with Hearing Impairments.* One literature review[72] concluded that, on average, hard-of-hearing students do not perform as well as normal-hearing children in any setting and that the difference in performance increases with age. The same researchers also concluded tentatively that hearing-impaired students gain some academic advantage but suffer regarding self-concept in mainstreamed classes.

The development of auditory/oral skills appears critical to the success of hard-of-hearing students in mainstream settings. A study involving such students, 90% of whom received support services from speech/hearing teachers or from teachers of deaf students, found that the three factors most related to their academic performance were oral communication, personality (for example, motivation, self-concept), and linguistic competence.[73] The students in this study were not so impaired as to need an interpreter in the classroom. Students with more profound hearing loss who use manual sign language might have great difficulty in general education classrooms: manual sign language has its own rules of grammar, and teachers who use standard English may not be effective at communicating complex concepts to these students within the constraints of a general education classroom.[74]

■ *Students with Educable Mental Retardation.* While definitions vary, students with educable mental retardation (EMR) generally have intelligence quotients (IQs) between 50 and 70, combined with deficits in adaptive behavior. Research suggests that such aspects of the educational environment as teacher characteristics, instruction, and classroom climate may be even more important to the success of students with EMR than they are to other students.

In one of the most extensive studies involving students with educable mental retardation and nondisabled students,[42] the academic achievement of students with educable mental retardation was predicted by a variety of classroom environment factors (teaching style, classroom climate), while that of nonhandicapped students was predicted by their family background (parents' education, economic status). Variations in the classroom environment accounted for nearly a quarter of the variance in the social acceptance or rejection of the students with mental retardation by their peers. The classroom factors associated with better outcomes for students with educable mental retardation were active involvement of the students in teacher-directed and supervised instruction (as opposed to passive individual seatwork) and the use of cooperative learn-

ing approaches, which promoted students' frequent interaction with nonhandicapped peers.

■ *Students with Severe Mental Disabilities.* Of all disability groupings, the students with severe/profound mental disabilities (generally with an IQ below 50) and those with emotional disturbance are the most likely to spend their school time in restricted, isolated settings. Lessening this social isolation is a major goal expressed by severely mentally disabled students and their parents, and research on this group has examined social outcomes rather than academic performance. Social interaction between severely disabled students and nondisabled students has increased in more integrated settings.[75]

Students with severe disabilities have been successfully reintegrated into neighborhood schools, and others have successfully avoided placement in restricted, residential settings. In one study,[76] researchers developed, field tested, and evaluated an intervention to return students with severe mental limitations from residential placements to their neighborhood schools and/or to avoid placing other students in residential programs. Considerable external support was provided by university researchers in the form of technical assistance and access to specialists such as "integration facilitators," speech/language pathologists, occupational therapists, and paraprofessionals. Of 77 students in this study, 58 successfully made the transition to their home school and avoided re-referral to an out-of-school residential placement; the remaining students continued to be maintained in general education classes in their home schools.

The Effects of Inclusion on Students Without Disabilities

Parents and teachers often have expressed concerns about the likely impact on students without disabilities when children with special needs are moved to the general classroom. Although the body of literature examining this issue is small, in general these studies have indicated that students without disabilities do not suffer from being in classes also serving students with mild disabilities (learning disabilities or mild behavior disorders) or severe mental disabilities.

Nondisabled elementary students have shown no difference on California Achievement Test scores, whether they were assigned to typical classes or to an Integrated Classroom Model (ICM), a highly structured class composed of one-third students with and two-thirds students without disabilities.[77]

Similarly, nondisabled students have benefitted academically from a program[78] that created an integrated classroom composed of one-third mildly disabled students and two-thirds nondisabled students. These classes also had two teachers, giving a low teacher-to-student ratio of about 1 to 14. The nondisabled students in the integrated classes benefitted most in a comprehensive test of reading, math, and language skills, showing greater gains than both nondisabled students in general classes and students with disabilities in integrated classes.

In an analysis of behavior and time management, one study[79] examined the behavior of 89 nondisabled students in grades 1 through 5 in five classrooms where 11 students with learning disabilities had been placed for an eight-month period. When the students with learning disabilities were added to the class, the nonhandicapped students spent the same amount of time (35% to 40%) in academic instruction; nonacademic behavior decreased significantly during math instruction. Further, the time devoted to waiting and classroom management activities decreased significantly in reading.

In general, studies have indicated that students without disabilities do not suffer from being in classes also serving students with mild disabilities or severe mental disabilities.

Research on the integration of students with severe mental disabilities has emphasized the social and emotional benefits to nondisabled children and teachers, showing increased awareness of the needs of persons with disabilities, increased levels of social development in nondisabled children, increased willingness to work with students with disabilities, and increased skills for teachers.[80]

Box 4

Interventions Designed to Promote Inclusion

- ***Prereferral interventions*** are individualized accommodations and adaptations made in the general classroom, with the goal of avoiding referral to special education. Although prereferral interventions are widely recommended and are required in many states, there are few data demonstrating that they lead to long-term academic improvement for struggling students. However, prereferral interventions do appear to reduce the number of students referred to special education.
- ***Teacher consultation*** typically involves assistance (for example, suggestions for teaching strategies) provided by a special educator to a general educator. The student toward whom the problem-solving process is targeted may be a general education student experiencing problems (possibly needing referral to special education) or a special education student in a general education class. Research on the impact of teacher consultation for students with disabilities is scant and inconclusive.
- Many types of ***modified instructional methods*** in the general classroom have been tried. Practices in this category are classwide changes, not modifications for individual students. Types of modified practices include, but are not limited to,
  - *direct instruction* (which, among other things, breaks academic skills down into small, sequenced steps);
  - *cooperative learning* (which groups students heterogeneously and makes the group responsible for the performance of all students);
  - *peer tutoring*; and
  - *cognitive strategy instruction* (in which students are taught specific learning strategies).

  Several instructional methods appear to result in modest improvements in academic outcomes for students with mild disabilities. The more promising programs involve lengthy (often multiyear) teacher training, teacher planning time, administrative support, and sometimes additional instructional staff. When additional resources are provided, outcomes for nondisabled students may be improved.
- In ***transenvironmental programming (TP),*** special educators and general educators coordinate their efforts to support individual students as they leave special education settings and reintegrate into general education. Transenvironmental programming appears to improve student academic progress initially, but there is some question as to whether faithful adherence to TP is feasible in general education.
- ***Whole school models*** have been developed to enhance the capacity of schools to address the needs of students with disabilities. These models have involved an intensive use of resources. Results show that 51% of the students with learning disabilities moved up in standing relative to their nondisabled classmates, while the remaining 49% lost ground. The best outcomes were attained by the project that used case-by-case reintegration of students into mainstream settings (as opposed to reintegration of all students), ongoing assessment and intensive instruction in special education, and transenvironmental programming.

Studies Based on School Effectiveness Literature

Theoretically, "effective schools" should be well matched to the classroom needs of special education students. Characteristics of effective schools include improved academic achievement, strong educational leadership, an orderly school climate, high achievement expectations, systematic monitoring of student performance, and an emphasis on basic skills. While the literature on effective schools is large, few studies examine the outcomes of special education students. However, research suggests that making schools more "effective" will not eliminate the need for special education. Two studies discussed below have demonstrated only modest gains for special education students in effective schools, while another has shown a negative impact.

One project,[45] studying 2,604 students in grades 1 through 6 at 32 schools, indicated that effective schools facilitate inclusion of special education students. Researchers found that students with mild disabilities in integrated programs in effective schools had better academic achievement and better social behavior than did similar students in special education classes in similar effective

schools. However, these students consistently did more poorly than their low-achieving but nondisabled classmates. Another study of 758 students (255 in special education, the remainder low achieving) showed some positive academic impact for students with mild disabilities attending effective schools but not enough to bring the special education students to the level of the low-achieving nondisabled students.[45]

On the other hand, a study of 58 effective schools[81] showed a negative relationship between general education students' reading performance (on the California Achievement Test) and that of special education students (on the Basic Academic Skills Sample).

Interventions Designed to Facilitate Increased Placement in General Education

A variety of interventions have been developed to facilitate increased placement of students with disabilities in general education. The goal of each of these interventions is to provide an appropriate education for the special education student in the general education setting. All of the promising interventions require significant resources for implementation, such as smaller class sizes, extensive consultation with specialists, added planning time for teachers, teacher's aides, and ongoing, intensive training.

Most of these interventions show some promise, though none show dramatic or consistent success for all or even most students. However, some of the caveats discussed earlier also apply to this body of research, especially the lack of random assignment. Therefore, the research must be interpreted with care.

These models are briefly described and conclusions summarized in Box 4.

Prereferral Interventions

Efforts to avoid referring students to special education by making instructional accommodations and adaptations for them in general classrooms are reasonably widespread. As of 1989, some 23 states required and 11 states recommended some form of prereferral intervention.[82]

However, there is limited evidence of the effectiveness of prereferral interventions. Research has generally looked only at whether the intervention succeeded in avoiding referral, not at student outcomes in general education. One review of research between 1961 and 1989 found that only 32 of 119 studies used student academic achievement to determine the success of the intervention.[83] Further, much of the research discussed below may have shown positive outcomes because of extra, sometimes intensive, assistance from the investigators. Results from these studies may be difficult or expensive to duplicate.

Most of these interventions show some promise, though none show dramatic or consistent success for all or even most students.

Several models of prereferral interventions have been tried that involve consultation between two or more teachers (and sometimes specialists), followed by classroom changes targeted toward the problems of the identified student. Interventions range widely and are not described in the research literature. However, in this author's experience, prereferral interventions may include individualized behavior-modification programs, changed seating arrangements, teaching in small steps, or increased monitoring of student progress.

In the Teacher Assistance Team (TAT) model, a team of general education teachers plan classroom modifications for students with special needs; a recent review found that only 21% of students focused on by TATs were referred for special education.[84] In another study, referrals were low (7% of targeted students), and teachers had an increased tolerance for a range of student abilities, though not for a wider range of student behaviors.[85]

Studies of Mainstream Assistance Teams, in which general education teachers consulted with special education teachers to design interventions, showed that teachers initially complained that extensive consultations leading to individualized pro-

grams for selected students were too complex and demanded too much time;[86] a shorter, less complex form of consultation was equally effective in achieving positive outcomes.[87] Students on average achieved between 66% and 72% of daily goals set by teachers.

Postreferral Teacher Consultation

The goal of postreferral consultation is to enable the general educator to deliver special education services in the general education classroom rather than sending special education students to a "resource room" for part of the day. A special educator consults with the general educator regarding the special needs of some students and suggests modified teaching techniques such as behavior management strategies or modified reading instruction.

There are relatively few data-based studies of these consultation programs that examine outcomes for special education students.[83] These studies are not conclusive: reported outcomes may be more related to initial differences among students than to the intervention itself. Two studies[88,89] comparing consultative services in general classrooms against pull-out services in resource rooms showed no differences in outcomes. A third study[90] in which the special educator provided *both* consultation *and* direct services in the general class showed slight improvement over outcomes achieved in resource rooms.

Data support the effectiveness of direct instruction for students with disabilities and also for low-achieving students who might be referred for special education.

Other studies suggest that the consulting model may hold promise for all students (including nondisabled students) if the model involves additional teaching resources. One study[91] of consultation at the first-grade level, where schools added 27% more staff, showed increased achievement across all levels of IQ. Another study found that students in schools using the consulting teacher approach scored higher than comparison schools on measures of achievement.[92]

Alternative Instructional Methods

Alternative instructional methods in the general classroom involve classwide changes, not individualized modification. As a group, they require lengthy (often multiyear) teacher training, teacher planning time, administrative support, and sometimes additional instructional staff. However, research indicates that these models of instruction are promising for improving outcomes for students with disabilities.

Direct Instruction

Direct instruction (DI) is a comprehensive curriculum, classroom management, and teaching system that includes teaching skills in small sequenced steps, providing immediate feedback, and offering frequent student-teacher interaction. It is designed to be a complete curriculum, rather than a supplement to an existing curriculum, and it requires the use of trained supervisors who work in the classroom.

A meta-analysis of 25 experimental studies of direct instruction involving students with mild, moderate, and severe disabilities found that 53% of the academic and social outcomes favored direct instruction, while no outcome measures favored the comparison treatment.[93] Outcomes were assessed in reading, math, language, spelling, writing, health, and social skills. Research suggests that learning under direct instruction appears optimal for students with disabilities when they respond to many questions during the course of a lesson and the teacher provides step-by-step instruction.[94] Data support the effectiveness of direct instruction for students with disabilities and also for low-achieving students who might be referred for special education.

Cooperative Learning

In cooperative learning approaches, teachers assign students to heterogeneous teams of four or five to achieve common academic goals.[95] Cooperative learning appears to have potential for assisting students with mild disabilities; they progress academically and are perhaps better accepted by their nondisabled peers.

Two models have shown positive academic results for students with disabilities but researchers have not been able to replicate those results consistently. A study of one model, Team Assisted Instruction (TAI), found increased learning in math computations (52% of a grade equivalent more than control students) for "academically handicapped" students,[96] though another study with a shorter intervention time (8 weeks versus 24 weeks) had disappointing results.[96]

Similarly, the Cooperative Integrated Reading and Composition (CIRC) model showed better achievement for mainstreamed special education students in reading comprehension (gained 1.9 grade equivalents more than controls) and vocabulary (gained 1.4 grade equivalents more than controls) in one study,[97] while another study of this program with a shorter intervention period (12 weeks versus one year) found no significant differences.[97]

Positive social outcomes for students with disabilities have been more reliable. Research comparing teams of students working under cooperative and competitive conditions consistently shows significantly more friendship choices of academically and emotionally handicapped students by nondisabled peers in cooperative conditions.[98] Another model helped decrease rejection for mainstreamed students but did not increase friendships.[99]

Studies of whole schools using cooperative learning have shown positive academic and social outcomes. An evaluation after one year of implementation found that students with disabilities in cooperative schools had significantly higher achievement (a 10% to 100% grade equivalent higher than their matched peers in control schools) with regard to reading vocabulary and reading comprehension.[95] Students with disabilities in the cooperative schools were also 30% more likely to be selected as friends by classmates.

Implementation of cooperative learning requires special curricular materials, extensive training, substantial time for planning and problem solving among teachers,[100] and considerable administrative support. Additional staff members are not required but may be desirable.

Peer Tutoring

Under peer tutoring, students work in pairs or in teams where one member serves as a tutor. While the primary goal of peer tutoring is to improve academic achievement, other goals include development of cooperative work habits and increased positive social interaction. A meta-analysis[101] of 19 studies found the performance level of the tutor and tutee were increased more than one-half a standard deviation above the performance level of control groups.

Peer tutoring may facilitate academic growth; however, among students with disabilities, it appears to promote fluency rather than initial acquisition of information. Consequently, it may be that peer tutoring is best used as a supplement to another intervention.

Cognitive Strategy Instruction

The research on children with learning disabilities indicates that these children are inactive learners who lack strategies for attacking problems;[102] that is, these students do not understand what strategies can be used to solve problems, and they have difficulty in spontaneously producing appropriate learning strategies.

Students with disabilities in cooperative schools had significantly higher achievement with regard to reading vocabulary and reading comprehension.

The Strategies Intervention Model (SIM)[103] trains students with learning disabilities to use specific strategies to solve problems and complete tasks independently. Research suggests that the SIM can assist students with learning disabilities to remain in general education classrooms.[104] However, the general educator must use specific routines to cue the students with learning disabilities to use these strategies. Without this support, the students do not use the strategies in the general classroom to the same extent they did in the special education resource room, where they originally learned the strategies. The developers of the SIM believe that three to five years are needed to fully train teachers in its use.

Transenvironmental Programming

Transenvironmental programming[105] is a process to assist students in special education classrooms to reintegrate into the general education classroom. In the transenvironmental programming model, the special education teacher determines what academic and behavioral skills the student needs to succeed in general education and teaches these skills to students in special education. Once the student has moved to the general classroom, the special educator monitors whether the skills are used by the student in the general classroom.[106] Student progress is monitored through frequent testing.

Transenvironmental programming appears to improve student academic progress initially but has not been shown to be sustainable in the general classroom. In one study, a group of students with learning disabilities who were being reintegrated into general education had greater achievement than did members of the control group.[105] However, a time-series analysis showed that the improvement occurred only in the special education class. A separate study showed that reading improvement also occurred only in the special education class.[107]

The best outcomes were attained by the project that used frequent, structured meetings between general and special education teachers.

There is some question as to whether faithful adherence to transenvironmental programming is feasible in general education. Implementation of transenvironmental programming requires considerable specialized teacher training, expertise, and time for evaluation, planning, and consultation between the special educator and the general educator.

Schoolwide Models

Is it possible to enhance the capacity of a school as a whole to meet the needs of all children? One of the priorities of research programs in the Office of Special Education Programs (OSEP) was to develop and evaluate schoolwide models for educating students with disabilities in general education. Three OSEP-funded projects used multiple schoolwide interventions—including teacher consultation, peer tutoring, intensive prereferral services, cognitive strategy instruction, and cooperative learning—toward this end. These three projects created a common base of student outcome data.[108] Two projects required inclusion for all students and eliminated resource pull-out programs, while the third project used case-by-case reintegration and retained the continuum of services. Most of the students with disabilities were identified as having learning disabilities.

Outcome data showed that 54% of the students with learning disabilities achieved gains on reading achievement in excess of the standard error of measurement. Fifty-one percent of the students with learning disabilities moved up in standing relative to the nondisabled students in these schools, while the remaining 49% lost ground. Forty percent of the students with disabilities had academic gains of less than half the size of the gain made by the average student without disabilities.

The best outcomes were attained by the project that used

- case-by-case reintegration of students into mainstream settings (as opposed to reintegration of all students);
- maintenance, rather than elimination, of the pull-out special education program;
- ongoing assessment and intensive instruction in special education;
- transenvironmental programming to increase the similarity of the instruction, curriculum materials, and behavioral expectations between the general and special education classrooms; and
- frequent, structured meetings between general and special education teachers.

Conclusions

What Works in Educating Students with Disabilities?

The intervention studies cited above suggest that these various intervention models can, in some instances, have a positive impact in (1) improving academic outcomes for students with disabilities, (2) improving relationships between students with and without

disabilities, or (3) reducing referrals for special education.

However, these studies also indicate that, even when academic outcomes for students with disabilities are positive, no intervention eliminates the impact of having a disability on a student's level of achievement. In no study did the students with disabilities achieve commensurately with their nondisabled peers. Even when relationships between students with and without disabilities are the focus, the research suggests that acceptance rather than friendship is the more likely outcome.

Further, the interventions that were effective in improving academic outcomes for students with disabilities required a considerable investment of resources. As a group, these interventions involved intensive retraining of teachers; ongoing support, supervision, and technical assistance from university faculty and other outside staff; supplementary curricular materials and training manuals; and administrative support from school or district personnel, particularly in providing time for training, planning, and various types of meetings. Also, both the intervention and descriptive research included in this article indicate that other supports—for example, smaller class sizes—may be required. Some researchers argue that, given the effort required by these interventions, teachers should volunteer for this work, not be forced to participate. However, this could affect the proportion of children with disabilities who would be in each volunteer teacher's classroom.

This research suggests that the most effective interventions for students with disabilities have the following characteristics: a case-by-case approach to decision making about student instruction and placement; intensive and reasonably individualized instruction combined with very close cooperation between general and special education teachers; and careful, frequent monitoring of student progress. All of these elements require significant teacher time and supportive resources.

Is Placement the Critical Factor?

There is no compelling evidence that placement is the critical factor in student academic or social success; the classroom environment and quality of instruction have more impact than placement per se on the success of students with disabilities. Unfortunately, descriptive research on the condition of general education indicates that typical practice is different from the model programs that showed greatest success for students with disabilities. There is little evidence of the capacity of general educators as a group to make the extensive changes that are needed to facilitate more, and more successful, mainstreaming or inclusion, particularly if adequate resources are lacking.

The research does not support inclusion for all students with disabilities. On the contrary, it appears that there is a clear need for special education to continue, through preservation of the continuum of services.

Inclusion is not likely to lead to savings in the costs of education. The interventions described in this article required considerable investment of expensive resources.

At the same time, the research indicates that, given adequate resources, more students could be assisted to become more successful in general education settings.

What Are the Cost Implications?

Inclusion is not likely to lead to savings in the costs of education. Referring fewer students for special education and reducing the current expensive requirement of individual assessments should lead to some savings. It is unclear whether or to what extent current special education staffs would be reduced or retained. Depending on circumstances, special educators might be needed to operate pull-out resource rooms, consult with general educators, or work on a regular basis in the general classroom.

The interventions described in this article required considerable investment of expensive resources. Possible savings mentioned above might be offset because school districts might need to (1) hire more teachers or more paraprofessionals to handle increased membership in general education classes and (2) provide considerable amounts of ongoing professional development activities to general educators and

paraprofessionals. Increased time probably would be required for planning instruction and for problem solving about individual students, which in turn would demand innovative scheduling and release time.

In summary, research does not support assertions such as those in *The Wall Street Journal* or *U.S. News and World Report* that special education is cheating students academically or socially or that it costs more than adequately educating students with disabilities in general education settings. Instead, research supports the continuation of efforts to improve academic and social outcomes for students with disabilities in both special and general education settings and indicates that instruction, not setting, is the key to achievement of success as measured by student outcomes.

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