

## Outcomes for Students With and Without Learning Disabilities in Inclusive Classrooms

Janette Kettmann Klingner, Sharon Vaughn, Marie Tejero Hughes,  
Jeanne Shay Schumm, and Batya Elbaum

*Office of School-Based Research  
University of Miami*

This study examined the academic progress of students with and without learning disabilities (LD) placed full-time in general education classes in Grades 3 to 6 at 1 elementary school. Through an intensive, yearlong professional development program, general and special education teachers were taught to implement instructional approaches identified from previous research to be effective in general education settings with students who represent a wide range of achievement levels. Results indicated that although most students with LD made considerable gains over the school year, others showed no improvement. Fewer low- and average-achieving students improved than students with LD; virtually all high-achieving students showed growth. Of greatest concern were those students who began the year as very poor readers and as a group made no progress. Full-time placement in the general education classroom (with in-class special education support) did not adequately meet the needs of these students.

Restructuring efforts, largely influenced by the education reform movement, have been gathering momentum during the 1980s and 1990s. Concurrently, special education has had its own reform movement. The full-time inclusion of students with disabilities became a topic of heightened interest following the Regular Education Initiative (Will, 1986) and has continued to be an issue as various advocacy and teachers' groups debate the most appropriate course of action for educating students with disabilities (Fuchs & Fuchs, 1994). Although a few supporters of the full-inclusion movement would like to abolish special education and eliminate the role of "special educators" (Lipsky & Gartner, 1987, 1989; Stainback & Stainback, 1992; Thousand & Villa, 1990), the predominant approach toward inclusion appears to be a less radical procedure that augments rather than replaces the continuum of services for students with disabilities (The Council for Exceptional Children, 1993; National Association of State Boards of Education, 1992).

Although discussions of the pros and cons of inclusion are likely to continue (e.g., Kauffman & Hallahan, 1995), many recognize that what is missing is empirical evidence that documents the effects of inclusion, particularly for students with learning disabilities (LD). The implicit assumption in much of the literature is that students with disabilities are better off when they are instructed in the general education classroom alongside their same-age peers. Whereas this is undoubtedly true for many students with disabilities, further information is needed concerning the characteristics of students who make gains in full-time general education placements and the conditions under which their special educational needs are met.

Available evidence suggests that students with LD do not fare well academically in general education classrooms where undifferentiated, large-group instruction is the norm (Baker & Zigmond, 1990; Fuchs, Fuchs, & Fernstrom, 1993; Larivee, 1986; McIntosh, Vaughn, Schumm, Haager, & Lee, 1993). Even when special education support is provided in the general education classroom, students may not make desired gains (Zigmond et al., 1995).

### ACADEMIC OUTCOMES FOR STUDENTS IN INCLUSIVE CLASSROOMS

Variations of in-class instruction for students with disabilities have been called mainstreaming (Klassen, 1994; Truesdell & Abramson, 1992), integrated instruction (Deno, Maruyama, Espin, & Cohen, 1990; Zigmond & Baker, 1990), consultation programs (Schulte, Osborne, & McKinney, 1990), and inclusion (Zigmond et al., 1995). Thus, when examining the literature regarding the academic outcomes for students in inclusive classrooms, it is difficult to determine exactly what kinds of programs have been compared. For example, the extent to which special education support is provided for students in the general education classroom is not always clear. Furthermore, the type and severity of disabilities under consideration vary, limiting the generalizability of findings. Despite differences in outcome depending on the category of exceptionality, some researchers continue to group all types of exceptionality together when describing the effects of inclusion (e.g., Baker, Wang, & Wahlberg, 1994-1995). In their meta-analysis, Wang and Baker (1985-1986) reported that "mainstreamed disabled students consistently outperformed nonmainstreamed students with comparable special

education classifications" (p. 503). Yet closer inspection of their sample indicates that only 3% of their participants were students with LD. In another meta-analysis that included many of the same studies, Carlberg and Kavale (1980) found an overall effect size of  $-.12$ , indicating superiority for general education class placement. However, special class placement was only inferior for students with below-average IQs and was significantly superior for students with LD and behavior disorders. In a more recent meta-analysis, Baker (1994) calculated an academic effect size of  $-.08$  (in favor of inclusive classrooms) that reportedly did not vary across type of special needs students.

Thus, the effectiveness of general education classrooms for students with disabilities may be affected by many factors including the type and severity of the disability. As noted by Klassen (1994) in a review of research on mainstreaming, "academic progress in integrated versus segregated settings has been hard to assess" (p. 34). One obstacle is that it is difficult to randomly assign students to program type. Using a quasi-experimental design, Deno et al. (1990) found that the performance of students with mild disabilities was not significantly different in integrated versus resource settings except in spelling (in which case results favored the resource program). Essentially, special education students did poorly in both settings. Marston (1996) reported that students who received services that combined pull-out and in-class special education support improved more on curriculum-based measures of reading than students in inclusion only and pull-out only settings.

In a study where students with LD were randomly assigned to one of four conditions—consultative services for classroom teacher only, consultation combined with in-class instruction, one period of resource room instruction per day, and two periods of resource room instruction (Schulte et al., 1990)—an examination of academic outcomes indicated that students who received a combination of consultation and in-class direct services showed small but significant overall gains in comparison with students placed in resource programs. However, when achievement was examined separately for reading, written language, and math, there were no statistically significant differences.

Rather than comparing program types, other studies have examined the progress of students with LD in general education classes. Zigmond and Baker (1990) studied the impact of mainstreaming on the academic achievement of 13 students with LD and found that despite more time allocated for reading and math instruction, students placed full-time in general education classes made no significant progress in reading or math and earned lower grades. Truesdell and Abramson (1992) compared the academic behavior and grades of mainstreamed students with mild disabilities and regular elementary school students and reported that the mainstreamed students fared nearly as well as their peers without disabilities. More recently, Zigmond et al. (1995) compared the achievement of students with LD with that of their nondisabled peers in three separate studies (across six schools) and concluded that despite large investments of time and resources for preparation, planning, training, and support, less than half of the students with LD made meaningful gains in reading. For a substantial number of the students with LD

in these schools, the enhanced educational opportunities provided in their general education classrooms did not produce satisfactory outcomes (Baker & Zigmond, 1995; Zigmond, 1995). Zigmond et al. concluded that although the students with LD were receiving a very good general education, they were not obtaining an adequate special education. In sum, even when provided with support within their general education classrooms, students with LD have at best achieved mixed results.

Little research is available regarding the academic outcomes for students without disabilities in inclusive classrooms. Two studies that investigated the effectiveness of consultation models for a broader range of students (Cantrell & Cantrell, 1976; Knight, Meyers, Paolucci-Whitcomb, Hasazi, & Nevin, 1981) noted overall increased achievement levels. Sharpe, York, and Knight (1994) examined differences in academic performance between 35 students without disabilities educated in classrooms that included students with moderate to severe disabilities (e.g., moderate to profound mental retardation) and 108 general education students who were not in inclusive classrooms. Results indicated no statistically significant differences between the two groups on academic measures.

These studies did not specifically address the academic achievement of high-achieving students. Yet teachers and parents have expressed concern that the attention given to students with disabilities in inclusive classrooms might limit the time available for other students and lessen the quality of their instruction, inadvertently "holding back" higher achieving students in particular (Murphy, 1996; Vaughn, Schumm, Jallad, Slusher, & Saumell, 1996). Therefore, an examination of academic outcomes for students in inclusive classrooms should consider effects across achievement levels.

The purpose of this article is to describe the academic outcomes for the high-achieving students, low- to average-achieving students, and students with LD at an elementary school that provided instruction for students with LD in the general education classroom with coteaching between the general and special education teachers for part of the school day. Of particular interest were the academic characteristics of students with LD who made reading gains on par with their classmates compared to those who did not.

## METHOD

### Participants

The participants for this study were 114 students in Grades 3 through 6 at one elementary school in a large, metropolitan school district in the southeastern United States. The total school population included 937 students (94% Hispanic, 4% White non-Hispanic, 1% African American, 1% Asian; 75% on free or reduced lunch).

Participants included a total of 25 students with LD. School district guidelines for identifying students with LD include the following criteria: discrepancy of 1 to 1.5 *SD* (depending on age) between IQ and achievement and evidence that physical or sensory disabilities are not the primary

cause of learning problems. The mean full-scale IQ score was 95.9 ( $SD = 11.0$ ).

Teacher ratings were used to identify nondisabled students as either high achieving or low to average achieving. Teachers' ratings were based on grades, test scores, and classroom performance in language arts relative to that of peers. Table 1 provides the number and sex of students in each category, by grade.

### Inclusion Model

Two different special educators were each assigned to three general education classes (six classes total). Classes each included 31 to 37 students, with 3 to 8 of the students identified as LD. The special education teacher worked in each classroom 45 to 90 min each day (depending on the number of students with LD in the class). During that time the role of the special educator was to coteach, instruct small groups of students as needed, and work one-on-one with students with LD. In addition, the special education teacher coplanned with each teacher for at least 30 min per week.

Only students with LD who were identified as likely to benefit from inclusion were placed in a general education classroom at the age-appropriate level. A third special education teacher at the school provided pull-out services in a resource room for students for whom an inclusion classroom was not considered the most appropriate placement (these students were not included in these classrooms or this study).

The model implemented at this school represented what we consider to be "responsible" inclusion (Vaughn & Schumm, 1995). For example, teachers chose to participate in the program, adequate resources were provided for inclusion classrooms (e.g., additional computers and paraprofessionals), the model was developed at the school-based level, a continuum of services was maintained, and students' individualized education programs were continuously monitored (and modified).

TABLE 1  
Distribution of Students by Grade, Sex, and Achievement Category

	LD	LAA	HA	Total
Grade				
3	4	15	7	26
4	6	11	7	24
5	8	13	13	34
6	7	15	8	30
Sex				
Boys	19	25	15	59
Girls	6	29	20	55
Total	25	54	35	114

Note. LD = students with learning disabilities; LAA = low-achieving students; HA = high-achieving students.

### Procedures

All participating general ( $n = 4$ ) and special ( $n = 2$ ) education teachers were the recipients of an intensive, yearlong professional development program that focused on improving student outcomes in literacy.

*Description of the professional development program.* Teachers participated in four all-day workshops. The contents of the professional development workshops were identified by teachers through a series of interviews conducted during the previous year to identify the areas with which they felt they most needed assistance. The topics teachers identified were reading and writing. Thus, four instructional practices that targeted reading and writing were identified: the Writing Process Approach (e.g., Calkins, 1986; Graves, 1983), Collaborative Strategic Reading (Klingner, Vaughn, & Schumm, in press), Classwide Peer Tutoring (e.g., Delquadri, Greenwood, Whorton, Carta, & Hall, 1986; Mathes & Fuchs, 1993), and Making Words (e.g., Cunningham & Cunningham, 1992). Practices were selected based on the following criteria: (a) They had demonstrated effectiveness in general education classrooms with students with LD, (b) they promote learning in a particular area of literacy, (c) they were multilevel and could be used in classrooms with a wide range of achievement levels, and (d) they did not require extraordinary expenditures of materials and equipment.

Because these four instructional practices have been described elsewhere (Vaughn, Hughes, Schumm, & Klingner, 1998; Vaughn, Schumm, & Forgan, 1995), a brief overview is provided. The first instructional practice, the Writing Process Approach (e.g., Graves, 1983), is well suited for heterogeneous classrooms because students work at their own levels as they draft, share, edit, and publish while receiving feedback appropriate to their needs (Zaragoza & Vaughn, 1992). The second practice, Collaborative Strategic Reading (Klingner & Vaughn, 1996; Klingner et al., in press), teaches reading comprehension strategies (e.g., prediction, main idea, vocabulary) for content area reading materials through heterogeneous cooperative learning groups. The third practice, Classwide Peer Tutoring (e.g., Mathes & Fuchs, 1993), improves students' decoding, fluency, and comprehension skills through partner reading. The fourth practice, Making Words (e.g., Cunningham & Cunningham, 1992), teaches phonemic awareness, decoding skills, and spelling patterns while children manipulate individual letter tiles to form increasingly difficult words.

One instructional practice was taught during a full-day professional development workshop at the beginning of each of four 9-week periods during the school year. These 9-week segments corresponded with the school's grading periods. Both general and special education teachers who participated in this study attended all four workshops. Subsequent to each professional development day, teachers and researchers met after school once a month for 2 hr to problem-solve and share ideas about the implementation of that particular instructional practice. Instructional practices were taught in the order they were described previously: Writing Process, Collaborative Strategic Reading, Classwide Peer Tutoring, and Making Words.

## Measures

All students in these general and special education teachers' classrooms with permission to participate took group-administered reading and math tests. Because our professional development program focused on literacy, we were primarily interested in assessing students' growth in reading. However, we also included a math test to add to our understanding of students' academic performance and to control partially for teacher effects. In addition, all students with LD took two individually administered reading tests designed to further assess their progress.

*Basic Academic Skills Samples-Reading (BASS; Espin, Deno, Maruyama, & Cohen, 1989).* The BASS is a group-administered measure for students in Grades 1 through 6 that was derived from research on curriculum-based measurement procedures designed to monitor student growth in reading (Deno, 1985; Deno & Fuchs, 1987). The BASS reading subtest consists of three passages. Starting with the 14th word, every 7th word in each passage is replaced by a multiple-choice item containing the correct word and two distracters. Students are allowed 1 min to read each passage and select the words that best fit in the sentences. Passages are scored according to the number of correct answers (24 possible for Passage 1, 31 for Passage 2, and 26 for Passage 3). To prohibit the inflation of scores due to guessing, scoring is discontinued after three consecutive incorrect answers. Developers of the BASS reading subtest report a correlation of .85 between the number of correct items and the number of correct words read aloud (Espin et al., 1989).

For our total sample, the correlation coefficient for the pretest administrations of the BASS reading subtest and the school-administered Stanford Achievement Test (SAT) reading tests was .75. For the posttest administrations of the same two tests, the correlation coefficient was .68.

*Kaufman Test of Educational Achievement (KTEA; Kaufman & Kaufman, 1985).* The KTEA is an individually administered measure of school achievement for students in Grades 1 through 12. For the purpose of our study, we administered the reading decoding and reading comprehension subtests of the KTEA. These subtests have been shown to have both high internal consistency and stability. The subtest split-half reliability coefficients for Grades 3 through 6 were between .94 and .95 for reading decoding and between .88 and .93 for reading comprehension. Correlations between scores on these subtests and scores on other reading tests were in the range of .75 to .89, indicating high concurrent validity of measurement (Kaufman & Kaufman, 1985).

*Qualitative Reading Inventory (QRI; Leslie & Caldwell, 1994).* The QRI is an individually administered informal reading inventory. The word identification tests (the only subtest we administered) are composed of 20 words each

for primer through junior high reading levels. Students read the words orally at each level until they reached their frustration reading level. The words on the subtest are derived from the graded reading passages of the QRI. Word frequency was estimated by the authors using the Standard Frequency Index and ranged from 40.28 to 70.01 (Carroll, Davies, & Richman, 1971). Words correct on the word identification tests were highly correlated with students' performance on word recognition and reading rate in context (Leslie & Caldwell, 1994).

*Mathematics Concepts and Applications Test (MCA; Stecker, Fuchs, & Hamlett, 1992).* The MCA is a group-administered measure designed for students in Grades 1 through 6. The MCA systematically samples problems from the concepts and application portions of the elementary math curriculum (i.e., addition, subtraction, geometry, measurement, and word problems). Students are given 10 min to complete 50 calculation problems and 15 min to complete 50 application problems. Performance is scored as the number of correct problems on each section of the MCA. The authors of the MCA reported a Cronbach alpha of .90 and a criterion validity of .80 with respect to the applications subtests of the SAT (Stecker et al., 1992).

## Data Collection Procedures

For all measures, data collection occurred at the beginning and end of the school year. Both individual and group-administered measures were administered by trained research assistants. During group administration, at least two researchers were present in the classroom to assure that all students had the assistance they needed to complete measures according to directions.

## RESULTS

We present our results in two sections, progressing from the more global academic outcomes for achievement groups to more specific findings for students with LD. Because the teacher intervention focused on instructional practices aimed at improving literacy skills, reading tests were examined more extensively than math tests.

### Academic Outcomes for Achievement Groups

*Gains by achievement group.* To assess the extent to which the students with LD, low- to-average achieving students, and high-achieving students progressed in their inclusion classrooms, we examined the gains of each achievement group separately. To determine if pre- to posttest gains were statistically significant, we conducted *t* tests for paired samples for each measure, setting *p* at .006 to maintain a family-wise alpha of .05 (Keppel, 1982). Table 2 presents the means, standard deviations, *t*-test results, and effect sizes for each measure, by achievement group.

TABLE 2  
Means and Standard Deviations by Achievement Level, With *t*-Test Results and Effect Sizes

	Fall		Spring		<i>df</i>	<i>t</i>	<i>ES</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
BASS reading							
LD	3.34	2.01	4.91	3.52	24	3.20*	.78** ( <i>p</i> = .004)
LAA	5.22	2.95	6.78	3.03	53	4.98*	.58 ( <i>p</i> = .000)
HA	7.58	2.85	10.82	3.70	33	7.60*	1.08 ( <i>p</i> = .000)
Math computation							
LD	17.52	7.76	21.16	9.23	24	2.62	.47 ( <i>p</i> = .015)
LAA	20.67	8.92	27.28	8.39	51	6.59*	.73 ( <i>p</i> = .000)
HA	27.91	7.73	34.29	39.29	4	4.76*	.82 ( <i>p</i> = .000)
Math application							
LD	16.96	7.65	18.96	7.66	24	2.71	.26 ( <i>p</i> = .012)
LAA	20.09	8.43	26.39	9.58	52	10.23*	.76 ( <i>p</i> = .000)
HA	28.80	7.20	34.46	6.78	34	6.87*	.79 ( <i>p</i> = .000)

Note. BASS = Basic Academic Skills Samples; LAA = low- to average-achieving students; HA = high-achieving students.

\*Statistically significant with an alpha set at *p* .006. \*\*It is possible that this effect size is inflated somewhat due to spuriously low pretest scores. However, an examination of pretest raw scores indicated that numbers were distributed normally—a statistical test of skewness was not significant.

The low- to average-achieving and high-achieving students improved at statistically significant levels on all reading and math measures. The students with LD improved at statistically significant levels in reading, the area targeted in our intervention, but not math (although gains approached significance).

**Patterns of improvement.** To further examine the performances of students within each achievement group, we analyzed the magnitude of the fall to spring gains on the BASS reading subtest and calculated the percentage of students within each group who showed actual improvement. Gains were considered to indicate real growth (Zigmond et al., 1995) if they surpassed the standard error of measurement (.19) for the pretest administration of the subtest to a local sample that included students in this study as well as students from other schools in the same district (*n* = 242).

Eighty-two percent of these third- through sixth-grade students showed gains. The greatest percentage of students to improve in reading were high-achieving students (97%). Considerably fewer low- to average-achieving students made real growth (74%). Notably, a higher percentage of students with LD than low- to average-achieving students showed growth (80%).

More students with LD showed growth in reading than low- to average-achieving students, suggesting that students with LD were making some progress toward catching up with their classmates. As in the Zigmond et al. (1995) study, our next analysis focused on the extent to which the education in inclusion classrooms helps prevent further widening of the achievement gap between students with LD and their peers. To address this issue, we looked more closely at the magni-

tude of students' reading gains. We calculated the mean gain score for each grade and then compared the gain of every student with the average gain of their relevant peer group (see Table 3).

As with the previous analysis, the high-achieving group demonstrated the greatest percentage of students to achieve growth in excess of the classroom mean (about two-thirds). Similar percentages of students with LD and low- to average-achieving students surpassed their classroom norm (about one third of each). It could be considered encouraging that almost as great a percentage of students with LD as low- to average-achieving students surpassed their class average. However, although some students with LD showed adequate improvement in comparison with their peers, many others did not. Our next analyses focus on further understanding the reading improvement of students with LD.

TABLE 3  
Percentage of Students With Gains on the BASS That Exceeded the Mean for Their Grade Level by Achievement Group

	<i>n</i>	%
Students with LD	25	32
LAA students	54	37
HA students	35	63
Total	114	44

Note. BASS = Basic Academic Skills Samples; LAA = low- to average-achieving; HA = high-achieving.

### Further Analyses of the Reading Performance of the Students With LD

To add to our understanding of the academic outcomes for the students with LD, we examined students' pre- and posttest performances on the QRI graded word lists and the reading decoding and reading comprehension subtests of the KTEA. Table 4 presents the percentages of students with LD who placed at each grade level on the word lists of the QRI, and Table 5 lists the means and standard deviations from the KTEA.

The students who began at a first-grade reading level or lower on the QRI stayed at a low level (36% on the pretest and 36% on the posttest). It was the students who started out at a higher grade level who appear to have improved the most, with 24% of the students with LD finishing at a fifth- or sixth-grade level. On the KTEA, it appears that the poorest readers kept the overall mean difference score low.

### DISCUSSION

This study addressed issues regarding the academic progress of students representing a range of achievement groups in an inclusion setting. The placement of students with disabilities has been the subject of extensive discussion over the past few years (e.g., Fuchs & Fuchs, 1994; Kauffman & Hallahan, 1995). Although a commonly held belief contends that many students with LD fare equally well whether educated in re-

source rooms or full-time general education settings (Baker et al., 1994-1995), accumulating evidence suggests that many students with LD do not perform well academically in full-time general education placements (Baker & Zigmond, 1990; Zigmond et al., 1995), even when significant efforts have been implemented to ensure their success (Jenkins et al., 1994; Zigmond et al., 1995). Further information is needed about the students who do and do not make gains in full-time inclusion classrooms and the conditions under which their special educational needs are met.

Over the past 4 years we have worked cooperatively with the faculty of an elementary school to facilitate the full-time integration of students with LD in general education classrooms. The inclusion program at this school is characterized by the clustering of students with LD in general education classes, in-class support from special education teachers, and the use of supplementary instructional practices designed to enhance reading outcomes for students with LD (Hughes, Vaughn, & Schumm, 1996; Schumm & Vaughn, 1995; Vaughn et al., 1998). Considerable efforts by the school's administrators, teachers, parents, and our research staff have been exerted to successfully restructure the special education service delivery model from a more traditional resource room program to an alternative in-class model. The purpose of this study was to document the effects of this inclusion program on students' academic growth. Of particular interest was the reading progress of students with LD.

Although some students with LD made considerable gains over the school year in reading, many made very modest gains and some made few or no gains. Twenty percent of the students with LD did not improve their scores on the BASS reading subtest over the school year. The lack of improvement of some of the students with LD must be considered in light of the poor progress of a subset of their low- to average-achieving classmates. Twenty-six percent of the low- to average-achieving students did not improve. And although the overall reading gains made by the students with LD were statistically significant, their math gains were not, indicating little progress in this academic area.

Three issues should be considered when interpreting the findings from this study. First, the external supports provided to this school and participating teachers were considerable and unlikely to be available to other schools that attempt to implement similar inclusion models (for further description, see Hughes et al., 1996; Schumm & Vaughn, 1995; Vaughn et al., 1998). The teachers perceived that these supports facilitated their implementation of inclusion (Vaughn et al., 1998).

Second, substantial numbers of low readers not identified as having learning disabilities were present in these inclusion classrooms (as reflected in their low pretest scores and their lack of progress). We would not expect this high number of poor readers to be representative of all classrooms where students with LD are placed full-time; however, other programs have reflected a similar student composition (Baker & Zigmond, 1995).

Third, those students with LD who were considered unlikely to benefit from inclusion had already been placed in a resource program. The students in these classes were not the lowest readers in the school.

TABLE 4  
Percentage of Students With Learning Disabilities at Each Grade Level on Qualitative Reading Inventory Graded Word Lists

Grade Level	Fall	Spring
Nonreader	12.0	8.0
Primer	4.0	8.0
First	20.0	20.0
Second	36.0	24.0
Third	8.0	16.0
Fourth	8.0	0
Fifth	0	8.0
Sixth	12.0	16.0

TABLE 5  
Mean Standard Scores and Standard Deviations on the Kaufman Tests of Individual Achievement for Students With Learning Disabilities

	Fall		Spring	
	M	SD	M	SD
Decoding	81.36	13.52	85.24	17.13
Comprehension	80.12	10.26	82.12	12.67

## Students With LD Who Made No Progress

Of greatest concern to us were the students who made very little or no revealed progress over the school year. Those students who were nonreaders or reading at the primer level were unable to acquire reading skills in a whole-class, full-time inclusion setting.

A possible explanation for the extremely low levels of progress made by this subset of students with LD is that the literature-based general reading programs in these inclusion classrooms and the four supplementary instructional practices we taught to teachers were designed to enhance reading outcomes in multilevel classrooms. They were not developed specifically for students who have severe reading disabilities. As has been demonstrated before, students with severe reading problems seem to require specific, intensive reading instruction individually or in small groups if they are likely to make significant progress (Torgesen, Wagner, & Rashotte, 1994; Vellutino, 1991).

Considerable research has accumulated supporting the finding that a small subgroup of students have severe difficulties learning to read (see for review, Lyon & Chhabra, 1996). These students, often referred to as dyslexic, are treatment-resistant, making it extremely difficult for them to learn appropriate reading skills during small-group or whole-class instruction within the general education classroom. The reading progress of this subgroup of students is of considerable concern in full-time inclusion settings where undifferentiated instruction is the norm. They require intensive individualized instruction that they are not presently receiving in either resource or inclusion settings. Torgesen et al. (1994; Torgesen et al., in press) described an intensive reading intervention delivered one-on-one by skilled and well-trained personnel that has yielded impressive gains with many students who previously had failed to learn in small-group or whole-class settings.

## Low- to Average-Achieving Students

A subset of low- to average-achieving students did not improve significantly over the school year. This finding reinforces the belief that average students are sometimes "lost in the middle" and may not progress sufficiently in general education classrooms that include students with disabilities (Murphy, 1996). Further research is needed that examines more closely the progress of low-achieving and average-achieving students in heterogeneous, inclusive classrooms.

## High-Achieving Students

Parents of high-achieving students as well as their teachers and administrators have indicated serious concerns about the progress of high-achieving students when students with LD are placed in their classrooms (Vaughn et al., 1996). This concern is even greater when the students with LD are placed full-time and not pulled out for reading or math instruction. The findings from this study suggest little basis for these

concerns. Virtually all of the high-achieving students realized reading gains that exceeded the standard error of measurement for their school. Although it is not possible to determine how these same high-achieving students would have performed if the students with LD had not been in their classrooms, their overall academic performance was quite high. Having spent a full year in this school interviewing teachers, administrators, and students (e.g., Hughes et al., 1996; Klingner, Vaughn, Schumm, Cohen, & Forgan, 1998; Vaughn et al., 1998), we have considerable data confirming that the high-achieving students liked their class arrangement and their role of helping others, and found having a special teacher for part of the day beneficial to everyone.

## CONCLUSION

The students of greatest concern to us were those who were very poor readers at the start of the school year and as a group made no progress, despite being part of a responsible inclusion program that received substantial support. We must conclude that full-time placement in the general education classroom with in-class support from special education teachers is not sufficient to meet the needs of these students. They require combined services that include in-class support and daily intensive, one-on-one instruction from highly trained personnel. This is an expensive proposition but appears to be the only solution that will yield growth in reading for students with severe reading disabilities.

## ACKNOWLEDGMENTS

This study was conducted with support from the United States Department of Education, Office of Special Education and Rehabilitation Grant No. H023R20005.

Special thanks are due to the principal (Kathy Astley), teachers, and students at Flamingo Elementary School who so generously allowed us into their classrooms. We also appreciate the assistance of Yaro Sojka and the United Teachers of Dade, Ellie Levine and the Florida Diagnostic and Learning Resources System, and Terry Reynolds and the teachers and students of Dade County Public Schools.

## REFERENCES

- Baker, E. T. (1994). *Meta-analytic evidence for non-inclusive educational practices: Does education research support current practice for special education students?* Unpublished doctoral dissertation, Temple University, Philadelphia.
- Baker, E. T., Wang, M. C., & Wahlberg, H. J. (1994-1995). The effects of inclusion on learning. *Educational Leadership*, 52(4), 33-35.
- Baker, J. M., & Zigmond, N. (1990). Are regular education classes equipped to accommodate students with learning disabilities? *Exceptional Children*, 56, 515-526.
- Baker, J. M., & Zigmond, N. (1995). The meaning and practice of inclusion for students with learning disabilities: Themes and implications from the five cases. *The Journal of Special Education*, 29, 163-180.
- Calkins, L. M. (1986). *The art of teaching writing*. Portsmouth, NH: Heinemann.

- Cantrell, R. P., & Cantrell, M. L. (1976). Preventive mainstreaming: Impact of a support services program on pupils. *Exceptional Children*, 42, 381-385.
- Carlberg, C., & Kavale, K. (1980). The efficacy of special versus regular class placement for exceptional children: A meta-analysis. *The Journal of Special Education*, 14, 295-309.
- Carroll, J. B., Davies, P., & Richman, B. (1971). *The word frequency book*. New York: American Heritage Publishing.
- The Council for Exceptional Children. (1991, April). *Statement on inclusive schools and communities*. Reston, VA: Author.
- Cunningham, P. M., & Cunningham, J. W. (1992). Making words: Enhancing the invented spelling-decoding connection. *The Reading Teacher*, 46, 106-115.
- Delquadri, J., Greenwood, C. R., Whorton, E., Carta, J. J., & Hall, R. U. (1986). Classwide peer tutoring. *Exceptional Children*, 52, 535-542.
- Deno, S. L. (1985). Curriculum-based measurement: The emerging alternative. *Exceptional Children*, 52, 219-232.
- Deno, S. L., & Fuchs, L. S. (1987). Developing curriculum-based measurement systems for data-based special education problem-solving. *Focus on Exceptional Children*, 19(8), 36-43.
- Deno, S., Maruyama, G., Espin, C., & Colton, C. (1990). Educating students with mild disabilities in general education classrooms: Minnesota alternatives. *Exceptional Children*, 57, 150-161.
- Espin, C., Deno, S., Maruyama, G., & Colton, C. (1989, April). *The Basic Academic Skills Samples (BASS): An instrument for the screening and identification of children at-risk for failure in regular education classrooms*. Paper presented at the annual American Educational Research Association Conference, San Francisco.
- Fuchs, D., & Fuchs, L. S. (1994). Inclusive schools movement and the radicalization of special education reform. *Exceptional Children*, 60, 294-309.
- Fuchs, D., Fuchs, L. S., & Fernstrom, P. (1993). A conservative approach to special education reform: Mainstreaming through transenvironmental programming and curriculum-based measurement. *American Educational Research Journal*, 30, 149-177.
- Graves, D. H. (1983). *Writing: Teachers and children at work*. Portsmouth, NH: Heinemann.
- Hughes, M. T., Vaughn, S., & Schumm, J. S. (1996). Schools restructure their special education programs for high incidence disabilities: Issues and outcomes. *Special Education Leadership Review*, 2, 1-15.
- Jenkins, J. R., Ronk, J., Schrag, J. A., Rudo, G. G., & Stowitschek, C. (1994). Effects of using school-based participatory decision making to improve services for low-performing students. *The Elementary School Journal*, 94, 357-372.
- Kauffman, J. M., & Hallahan, D. P. (1995). *The illusion of full inclusion: A comprehensive critique of a special education bandwagon*. Austin, TX: PRO-ED.
- Kaufman, A. S., & Kaufman, N. L. (1981). *Kaufman Test of Educational Achievement*. Circle Pines, MN: American Guidance Service.
- Keppel, G. (1982). *Design and analysis: A researcher's handbook*. Englewood Cliffs, NJ: Prentice Hall.
- Klassen, R. (1994, Summer). Research: What does it say about mainstreaming? *Education Canada*, 27-35.
- Klinger, J. K., & Vaughn, S. (1996). Reciprocal teaching of reading comprehension strategies for students with learning disabilities who use English as a second language. *The Elementary School Journal*, 96, 275-293.
- Klingner, J. K., Vaughn, S., & Schumm, J. S. (in press). Collaborative strategic reading in heterogeneous fourth-grade classrooms. *The Elementary School Journal*.
- Klinger, J. K., Vaughn, S., Schumm, J. S., Cohen, P., & Forgan, J. W. (1998). Inclusion or pull-out: Which do students prefer? *Journal of Learning Disabilities*, 31, 148-158.
- Knight, M. F., Meyers, H. W., Paolucci Whitcomb, P., Hasazi, S. E., & Nevin, A. (1981). A four-year evaluation of consulting teacher service. *Behavioral Disorders*, 6, 92-100.
- Larrivee, B. (1986). Effective teaching for mainstreamed students is effective teaching for all students. *Teacher Education and Special Education*, 9, 173-179.
- Lestic, J., & Caldwell, J. (1994). *The Quantitative Reading Inventory*. New York: HarperCollins.
- Lipsky, D. L., & Gartner, A. (1987). Cause of achievement and worthy of respect: Education for handicapped students as if they were full-fledged human beings. *Exceptional Children*, 54, 69-74.
- Lipsky, D. L., & Gartner, A. (Eds.). (1989). *Beyond separate education: Quality education for all*. Baltimore: Brookes.
- Lyon, G. R., & Chhabra, V. (1996). The current state of science and the future of specific reading disability. *Mental Retardation and Developmental Disabilities Research Reviews*, 2, 2-9.
- Marston, D. (1996). A comparison of inclusion only, pull-out only, and combined service models for students with mild disabilities. *The Journal of Special Education*, 30, 121-132.
- Mathes, P. G., & Fuchs, L. S. (1993). Peer-mediated reading instruction in special education resource rooms. *Learning Disabilities Research & Practice*, 8, 233-243.
- McIntosh, R., Vaughn, S., Schumm, J. S., Haager, D., & Lee, O. (1993). Observations of students with learning disabilities in general education classrooms. *Exceptional Children*, 60, 249-261.
- Murphy, D. M. (1996). Implication of inclusion for general and special education. *The Elementary School Journal*, 96, 469-493.
- National Association of State Boards of Education. (1992). *Winners all: From mainstreaming to inclusion*. (Available from National Association of State Boards of Education, 1012 Cameron Street, Alexandria, VA 22314)
- Schulte, A. C., Osborne, S. S., & McKinney, J. D. (1990). Academic outcomes for students with learning disabilities in consultation and resource programs. *Exceptional Children*, 57, 162-172.
- Schumm, J. S., & Vaughn, S. (1995). Getting ready for inclusion: Is the stage set? *Learning Disabilities Research & Practice*, 10, 169-179.
- Sharpe, M. N., York, J. L., & Knight, J. (1994). Effects of inclusion on the academic performance of classmates without disabilities. *Remedial and Special Education*, 15, 281-287.
- Stainback, S., & Stainback, W. (1992). *Curriculum considerations in inclusive classrooms: Facilitating learning for all students*. Baltimore: Brookes.
- Stecker, P. M., Fuchs, L. S., & Hamlett, C. L. (1992). *Technical features of mathematics operations and applications measures*. Unpublished manuscript. (Available from P. M. Stecker, St. Xavier University, 3700 West 103rd Street, Box 238, Chicago, IL 60655)
- Thousand, J. S., & Villa, R. A. (1990). Strategies for educating learners with severe disabilities within their local home schools and communities. *Focus on Exceptional Children*, 23(3), 1-24.
- Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1994). Longitudinal studies of phonological processing and reading. *Journal of Learning Disabilities*, 27, 276-286.
- Torgesen, J. K., Wagner, R. K., Rashotte, C. A., Alexander, A. W., & Conway, T. (1997). Preventive and remedial interventions for children with severe reading disabilities. *Learning Disabilities: A Multidisciplinary Journal*, 8(1), 51-61.
- Truesdell, L. A., & Abramson, T. (1992). Academic behavior and grades of mainstreamed students with mild disabilities. *Exceptional Children*, 58, 392-398.
- Vaughn, S., Hughes, M. T., Schumm, J. S., & Klingner, J. (1998). A collaborative effort to enhance reading and writing instruction in inclusion classrooms. *Learning Disability Quarterly*, 21, 57-74.
- Vaughn, S., & Schumm, J. S. (1995). Responsible inclusion for students with learning disabilities. *Journal of Learning Disabilities*, 28, 264-270.
- Vaughn, S., Schumm, J. S., & Forgan, J. (1995). Instructing students with high-incidence disabilities in the general education classroom. In J. A. Walter (Ed.), *Communicating student learning* (pp. 12.269-12.307). Alexandria, VA: Association for Supervision and Curriculum Development.
- Vaughn, S., Schumm, J. S., Jallad, B., Slusher, J., & Saumell, L. (1996). Teachers' views of inclusion. *Learning Disabilities Research & Practice*, 11, 96-106.
- Vellutino, F. R. (1991). Introduction to three studies on reading acquisition: Convergent findings on theoretical foundations of code-oriented versus whole-language approaches to reading instruction. *Journal of Educational Psychology*, 83, 437-443.
- Wang, M. C., & Baker, E. T. (1985-1986). Mainstreaming programs: Design features and effects. *The Journal of Special Education*, 19, 503-521.
- Will, M. C. (1986). Educating children with learning problems: A shared responsibility. *Exceptional Children*, 52, 411-415.
- Zaragoza, N., & Vaughn, S. (1992). The effects of process writing instruction on three 2nd-grade students with different achievement profiles. *Learning Disabilities Research & Practice*, 7, 184-193.



- Zigmond, N. (1995). An exploration of the meaning and practice of special education in the context of full inclusion of students with learning disabilities. *The Journal of Special Education, 29*, 109-115.
- Zigmond, N., & Baker, J. (1990). Mainstreaming experiences for learning disabled students (Project MELD): Preliminary report. *Exceptional Children, 57*, 176-185.

- Zigmond, N., Jenkins, J., Fuchs, L. S., Deno, S., Fuchs, D., Baker, J. N., Jenkins, L., & Couthino, M. (1995, March). Special education in re-structured schools. *Phi Delta Kappan, 76*, 531-540.

