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Alternative Service Delivery Models for Students with Learning Disabilities

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Abstract

More than 40 years of intervention research describes effective interventions for increasing the academic performance of students with learning disabilities. However, the performance and outcomes for students with learning disabilities remain discouraging, especially in light of the increasing cost to provide special education services. Between 60 – 70 percent of students with learning disabilities are unable to meet grade level performance standards in the basic academic areas of reading, writing and mathematics. The disconnect between research and practice suggests a need for rethinking special education service delivery. This paper reports the results of a program evaluation of a not-for-profit center specializing in working with students with learning disabilities, comparing the pre to post test gains and program costs to those typically seen in public education special education systems. A paired samples t-test examined pre to post test differences in reading, math and writing performance for a total of 104 students with learning disabilities between the ages of 6 – 17. Results were statistically and practically significant across all areas, and these results were obtained at costs much lower than those incurred under the current public education model. Implications for future research are discussed.

Keywords: Intervention, learning disabilities, academic achievement

Introduction

Special education instruction is a technical science (Odom, Brantlinger, Gersten, Horner, Thompson & Harris, 2005) requiring strong analytic skills as well as the ability to stay current on evidence-based instructional practices. This is especially true for students with learning disabilities (LD), who reflect a very heterogeneous and diverse population (Tyler, Yzquierdo, Lopez-Reyna, & Flippin, 2004), with varying response to intervention rates (Swanson, 2006). Even when students with LD present with similar instructional needs, they may function at vastly different performance levels (Karvonen, Wakeman, Moody, & Flowers, 2012), requiring

special education teachers to further differentiate their instruction. This diversity places significant demands on the special education teacher. To be effective, a special education teacher needs to be able to implement evidence-based practices not only with fidelity, but also with an individualized approach that is responsive to student need.

Arguably, in no other content area are the stakes as high to improve student achievement than in special education. The need for highly skilled, well-trained, special education teachers to deliver intensive, individualized instruction to support a child's academic growth cannot be overstated. However, there are substantial systemic and professional issues that complicate the implementation of an effective special education system, with recent research suggesting that both the quality and quantity of special education instruction are vulnerable to reduced levels of efficacy. For example, in their study to quantify the effectiveness of special education services as delivered in U.S. schools, Morgan, Frisco, Farkas, & Hibe (2008) note that children do not always receive special education services that can reasonably be expected to mitigate the effects of their disabilities. Other researchers have found special education classroom instruction to be routine and generic to all students in the class, rather than intensive and individualized as articulated in each student's IEP (Harry & Klingner, 2006).

Much of the decline in service delivery and performance can be attributed to special education teachers' working conditions. In recent years, special education teachers have steadily been asked to do more with less, resulting in a reduction of instructional time for students who require *more* intervention to be successful. In a year-long study of special education teachers in Texas, Vannest & Hagan-Burke (2009) found that on average only 16% of a special education teacher's school day is devoted to instruction. The rest of the time is spent on paperwork, administrative tasks, and meetings. Similarly, caseload requirements have steadily increased over the past two decades, despite empirical evidence that suggests 1) larger caseloads and instructional group sizes negatively impact math and reading achievement and 2) large caseloads are one of the major reasons for leaving the profession (Russ, Chiang, Rylance, & Bongers, 2001). As a result of the decreased access to regular, high-quality special education instruction, the academic achievement for students with disabilities has either declined or not improved, in spite of the range of evidence-based instructional practices developed over the past three decades. For example, Morgan et al. (2008) found that special education services from 2002-2004 had negative or statistically non-significant effects on young children's reading and mathematics skills. Nationally, the non-achieving trend has held steady for the past decade, with average scores on the National Assessment of Educational Progress (NAEP) reading and mathematics measures ranging from 61% to 72% below the basic level for 4th and 8th grade students with disabilities (U.S. Department of Education, 2011).

These trends have led leading special education researchers to question the current model of special education service delivery (Gersten & Dimino, 2006) and to call for a return to a more individualized, intensive focus on instructional delivery to students with learning disabilities. Policy makers however, argue that the financial cost of such a model is prohibitive. Under the current model of special education service delivery, in which a special education teacher can have caseloads of up to 75 students, the annual cost to educate a student receiving special

education services is estimated as 1.6 times that of a general education student. To provide an approximate dollar amount of this cost, consider the following example. The Ann E. Casey foundation estimated the cost per general education student in one Northwest state at \$8,633. This means that for a student with LD, the cost is approximately \$13,812 per year. Because most students with disabilities never exit the special education system, over 10 years of the student's school career, the additional cost of providing special education services totals approximately \$50,000 per student. The high cost of special education is a growing problem for public schools. However, the overall cost to societies is exacerbated when one considers the typically poor results achieved. When schools are unable to implement effective interventions, the results are devastating - especially for students with LD from low-income and minority backgrounds.

The current system of special education is failing students with learning disabilities. This is especially troubling given the significant research base examining effective interventions for students with learning disabilities. The problem can be summarized this way: we know what to do for students with learning disabilities, however, our current system of practice prevents us from being able to implement it well. Therefore, the focus of this paper is on examining the effect of an alternate service delivery model on the academic achievement of students with learning disabilities. In this article, we provide a program evaluation of intensive, individualized special education services delivered at a not-for-profit center specializing in learning disabilities. The purpose of the program evaluation is to determine the effectiveness of this model and to compare the financial cost of delivery compared to that of the public school system.

Methods

Setting and Participants

This program evaluation was conducted at a not-for-profit center in the Northwest that specializes in working with children with learning disabilities. The center conducts psycho-educational evaluations and provides 1:1 academic intervention services to meet the learning needs of people with learning disabilities. This evaluation examined the results of a total of 104 children (60 male; 44 female) ranging in ages from 6 to 17 who received academic intervention services at the center between 2009 – 2011. The average age of the sample was 11 years, 7 months, with the majority of students ($n = 81$) between the ages of 8 and 13. Approximately 90% of participants were White, with 8% Hispanic and 2% Black. Each of the participants had a documented specific learning disability, characterized by performance on an academic evaluation indicating academic performances below the 25th percentile on a standardized academic assessment and a processing deficit characterized by performances below the 25th percentile on a relevant cognitive processing assessment, with an otherwise 'normal' profile. Services are provided at a reduced rate to all clients, and 37% of participants received additional financial support to receive services.

Intervention

The center provides direct, systematic, multi-sensory instructional techniques tailored to meet each student's individual learning needs. Similar to the Individualized Education Plan (IEP) process in place within the public education system, a child undergoes a psycho-educational evaluation conducted by a clinical psychologist who assesses the child's academic performance and determines a cognitive profile in a variety of processing areas to include language, working memory, short-term memory, phonological processing, executive function, and other areas depending on the child's needs and presenting concerns. Then, a customized plan is designed for each child receiving intervention at the center. Goals, methods and strategies to be used to meet the student's needs are outlined, and services are provided by intervention specialists who are trained in evidence-based reading, writing and math instructional strategies designed for students with learning disabilities. All students are pre-tested in the academic area of concern, and post-tested after approximately 50 hours of intervention. For the sample included in this study, the mean program hours received was 52.41. Students work individually with a specialist, and typically attend the center twice weekly for one hour sessions.

Measures

For this program evaluation, we reviewed the effectiveness of reading, writing and math interventions, as these present the primary academic areas in which students with learning disabilities experience the most difficulty. The measures used to assess each academic area are described below.

Phonological Awareness. Phonological awareness is measured by the Comprehensive Test of Phonological Processing (CTOPP), using the Phonological Awareness Composite Score (PACS). The PACS measures an individual's awareness and access to the phonological structure of oral language. It is comprised of two subtests, one that measures segmentation skills (Elision) and one that measures sound-blending skills (Blending Words). The internal consistency reliability coefficients exceed .80 and the test/retest coefficients range from .70 to .92.

Reading Measures. Measures of reading are obtained using the Woodcock-Johnson Tests of Achievement, Third Edition (WJ-III). The Letter-Word Identification subtest requires examinees to identify printed letters and words. The Word Attack subtest requires examinees to identify letter sounds and to read phonically regular pseudowords. Internal consistency coefficients for these WJ-III subtests range from .87 to .94. Together, these subtests provide a Basic Reading Skill Composite. Test-retest reliability coefficients for the Basic Reading Skills cluster on the WJ-III Normative Update are reported between .82-.92. Measures of reading comprehension are obtained with the WJ-III Passage Comprehension subtest. The Passage Comprehension subtest requires examinees to provide a missing key word that makes sense in the context of a written passage. The three subtests, Letter Word Identification, Word Attack and Passage Comprehension provide a Broad Reading Composite score. Internal consistency coefficients for

these WJ-III subtests range from .88-.90. The WJ-III has parallel forms, which correlate between .80 and .96 across age groups.

Math Calculation. Measures of math calculation reported in this program evaluation were obtained with the WJIII Math Calculation Skills composite score. Calculation requires examinees to perform various mathematical calculations and Math Fluency requires rapid adding, subtracting and multiplying. Internal consistency coefficient for the WJ-III Calculation subtest is reported as .86, with test-retest reliabilities of Math Fluency reported at .90.

Writing. The WIAT-III Written Expression assesses the writing process through three tasks, writing letters and words as quickly as possible, writing sentences, and writing a paragraph or essay. Together, performance on these three subtests provide a Written Expression score. Internal consistency coefficients for these WIAT-III subtests range from .85-.98.

Data Collection and Analysis

All academic achievement measures were administered by trained specialists (not the student's teacher) at the center. All testing is administered according to the publishers' standardized directions. Data for this study was collected at different time periods across the two year timeframe. All assessment data are entered into a comprehensive database, which includes demographic information of the student, the hours of intervention received, and performance on all pre and post test measures. Descriptive statistics and frequency measures were run to ensure accurate data entry. To determine growth from pre to post test, a paired-samples t-test was conducted, and effect sizes analyzed. Effect sizes were computed using Cohen's d, where $d = (x_1 - x_2)/s$ as recommended by Dunlop, Cortina, Vaslow and Burke (1996).

Results

Academic Performance

The results by academic area and measure are included in Table 1. All t-tests were significant, and effect sizes ranged from .21 to 1.41 across measures. Measures of phonological awareness witnessed the largest effect size (range from 1.10 to 1.41), suggesting the highest impact of intervention in these areas. In addition to the growth on phonological awareness measures being statistically significant, the change in levels of performance have practical significance as well. Pretest levels on phonological awareness place mean performance at or near the 25th percentile, which is typically considered as at-risk, or below average, whereas post-test mean performance is at the 51st percentile, which is typically considered as grade level performance.

The growth in reading measures ranged in effect size from .21 to .54, with all t-tests indicating statistically significant changes from pre to post test performance. The effect sizes for word reading measures were small. This is likely attributable to pretest mean scores indicating levels of performance that are already within the average range, suggesting that this was not an area of intense focus during intervention. Gains in reading comprehension and overall reading skill

were significant. Moderate effect sizes were obtained in passage comprehension (.54) and on the broad reading composite (.43). The differences in levels of performance in practical terms are important as well; students began below the 25th percentile on passage comprehension and had mean post-test performance in the 35th percentile. While these gains are not as strong as those realized in phonological awareness, the post-test level performance places student achievement within the average range.

Effect sizes in math calculation were also moderate (.65). As with other areas, students' pre-test mean performance was in the below average range (13th percentile) whereas post-test mean performance indicated a standard score of 90, or 25th percentile, which while still low, places student performance at the cut point between low and average performance. Finally, effect sizes in writing were moderate - high (.72), and also of practical significance, with pre-test performances below the 25th percentile and post-test mean scores near the 35th percentile.

Cost-Benefit Analysis

To determine the costs of these services, we combined the costs in USD of conducting the psycho-educational evaluation with the cost of providing intensive services for 50 hours. The cost of a psycho-educational evaluation is \$2,000. The cost to provide intensive 1:1 services at the center is \$100 per hour (this is more than what clients actually pay, fund-raising is used to offset the cost of this model to clients, and qualifying clients are eligible for financial aid). This means that the total cost of services for each student is \$7,000. Because most students (between 50-55%) are able to realize academic gains that allow them to exit intervention services after just 50 hours, the \$7,000 is for many students the final cost of services. Nearly all students (between 90 – 95%) are able to exit after no more than 100 hours of intervention, the maximum cost for the majority of students is \$12,000. When this is compared to the \$50,000 cost of special education, in which a student with LD is typically identified in 3rd grade, but remains in the system until he drops out or graduates, the dollar cost savings are potentially substantial. These estimates include the dollar cost of providing services only however. Because sufficient data indicates that students with LD receiving services in the public system experience dropout rates as high as 60% (Cortiella, 2011), the \$50,000 grossly underestimates the overall cost to society for the increased cost for social services for students who drop out of school or who do not graduate with basic literacy skills.

Discussion

The current reported outcomes for students with learning disabilities served within the public special education system are discouraging. A recent review indicated that only 30% of students with learning disabilities are able to achieve grade level performance standards (Cortiella, 2011), and longitudinal studies of post-school outcomes for students with learning disabilities indicate that a significantly higher percentage drop out of school, or do not attain basic levels of literacy that will enable them to become successful in work or post-secondary school. These discouraging results are especially troubling given the high cost of providing special education services. The results are also troubling given the amount of research on effective intervention

practices for students with learning disabilities. The disconnect between research and practice suggests that what is needed to address the issues is not necessarily new interventions but rather, new models of service delivery that would allow special education teachers to work within an instructional environment that is more conducive to providing very intensive, individualized intervention to students. To explore this hypothesis we conducted an evaluation of intervention services provided at a not-for-profit center that specializes in working with students with learning disabilities. In this environment, students work with a trained specialist in a 1:1 setting. Program results from one year of services indicate that the results obtained in an average of 50 hours of intervention are both statistically and practically significant. A very basic cost analysis indicates that these more positive results are obtained at a much lower cost than the cost of special education services, which students typically require throughout their school career (Cortiella, 2011).

While these initial evaluations suggest promise for considering special education delivery models that are more intensive and individualized than is the case in the public school system, it is important to note that the evaluation presented here represents a first look at the issue, with several limitations in this study that restrict generalizability and require further investigation. First, although the center is a not-for-profit that does provide financial assistance for students from lower socio-economic status, many of the families who attend the center for services are from upper-middle class families. Second, students who attend the center tend to have academic and cognitive profiles that suggest a *pattern* of strengths and weaknesses. Fewer clients have general learning disabilities that impact performance across all academic areas, which can make remediation more challenging. Additionally, it is only in the last two years that the center has focused on providing math intervention, which resulted in a small sample and limited measures in that area. Program evaluations of future year math intervention will be important to validate the findings reported here. Finally, our cost benefit analysis is based on general comparisons between the results reported in this evaluation with general outcomes for the public school system. More carefully designed comparisons will be required to more fully investigate the idea that a highly intensive, highly individualized intervention can be more cost effective than the current approach to special education.

Conclusion

This paper explored the academic achievement results for students with learning disabilities obtained through an intensive, individualized intervention system and compared them to those typically obtained through more traditional models in terms of both effectiveness and cost. The results are encouraging and warrant further investigation of alternate service delivery models that allow for the intensive, individualized, intervention system originally conceived for special education service delivery.

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Table 1. Pretest and posttest means, t-tests and effect sizes by academic area

Test (n)	Pre-test Mean (SD)	Post-test Mean	Post-test SD	t	Effect size
Phonological Awareness Measures					
CTOPP 7-24: Phonological Awareness (40)	90.23 (8.25)	102.48 (9.08)		8.24**	1.41
CTOPP 7-24: Blending Words (39)	93.97 (8.29)	105.00 (11.70)		6.12 **	1.10
Reading Measures					
WJ-III Passage Comprehension (72)	89.65 (7.45)	94.13 (9.02)		5.68**	0.54
WJ-III: Broad Reading Composite (44)	85.86 (9.46)	89.75 (8.43)		4.62**	0.43
WJ-III Letter Word ID (74)	90.59 (9.17)	92.91 (8.96)		2.92**	0.26
WJ-III: Word Attack (74)	94.58 (6.66)	96.00 (6.40)		1.93*	0.22
WJ-III: Basic Reading Skills Composite (61)	92.38 (7.23)	93.92 (7.11)		1.98*	0.21
Math Calculation					
WJ-III: Calculation (11)	83.64 (8.24)	89.91 (11.15)		1.80*	0.65
Writing					
WIAT-III: Written Expression (37)	89.08 (7.52)	94.55 (7.72)		4.60**	0.72