EFFECT OF INCLUSIVE EDUCATION ON THE PERFORMANCE OF STUDENTS IN MATHEMATICS AND ENGLISH LANGUAGE: A SCHOOL STUDY

Olajide O. Agunloye
Georgia Regents University, Augusta, Georgia, USA
Betty R. Smith
Aiken County School System, Aiken, South Carolina, USA.

Abstract

Inclusion, as a model for educating students with disabilities (SWDs) is a fairly recent phenomenon that is changing the face of instructional settings and formats in schools in the United States. Inclusion is achieved through the seamless collaborative efforts of both general education and special education teachers in inclusive instructional settings. The purpose of this study is to determine the effect of inclusion, as an instructional practice, on the performance of students in a middle school in Southern, USA. The study covers a two-year period for groups of 5th grade students in mathematics and English Language Arts (ELA), in inclusive and general education instructional settings, through to the time they completed 6th grade. Data on the performance of the students in inclusion classes, in mathematics and ELA, over the two year period, were collected and analyzed. The concern that the performance needs of the special education students are not being met in the inclusion settings, and that the setting may be detrimental to the performance of regular education students, is not supported by the findings of this study in the two content areas. Implications for instructional leadership are also examined.

Keywords: Inclusive Education, Students with Disabilities, Student Performance, School Leadership

Introduction

Inclusion, as a model for educating students with disabilities (SWDs), is a fairly recent phenomenon which had its origins in several key pieces of legislation in the United States. The legistlative developments are changing the face of education, as we know it. In the 1970s, only 20% of children with

disabilities were being educated in regular school settings (US Department of Education, 2010). Beginning with the Education for All Handicapped Children Act of 1975 (EAHCA), which later became the Individuals with Disabilities Education Act of 1990 (IDEA), persons with disabilities who had once been isolated from typical educational settings were provided the opportunity to receive educational opportunities similar to those provided to other students. Steps were then taken to move students out of institutions that exclusively focused on meeting just the basic needs of SWDs in exclusive settings, to the preferred least restrictive environment within general education settings (US Department of Education, 2010).These pivotal changes were followed by the ratification of the 1997 amendments to IDEA and further supported by the reauthorization of the Elementary and Secondary Education Act (ESEA) in the form of the No Child Left Behind (NCLB) Act in 2001. As a result, schools started creating opportunities to *include* (emphasis adddd) children with disabilities in the flow of school life. As time went on, terms like *least restrictive environment* and *inclusion* (emphasis added) became part of the normal instructional language of education (Horowitz, 2013).

These programs also mandate the wide-scale use of assessments to monitor the progress and achievement of students with special needs. Especially, the NCLB Act of 2001 mandated that students in all subgroups be assessed and be accounted as part of accountability balance-sheet of school performance. Under NCLB, SWDs were expected to perform at 95% achievement level compared with regular students. This is because some members of some communities were concerned that the performance of regular education would be adversely impacted by the presence of SWDs in the same setting. In some communities and schools, clandestine efforts were made to move SWDs out of mainstream classes and place them in more restrictive environments where they could receive what they called "personalized instruction". This was designed in effort to creatively rig the system in order to meet the accountability requirements. At the same time, there were groups who were concerned that the significant strides made toward inclusion and holding school accountable for the achievement of *all* students were being undermined (Sapon-Shevin, 2011).

The debate still rages on regarding the effect of inclusion on the respective performance of SWDs and regular education students within inclusive education settings. Because teachers, schools, school-districts, and states are held accountable for student achievement, based on the NCLB Act, the focus of most elementary and middle schools is on English Language Art (ELA) and Mathematics (Cawelti, 2006). This is also the reason the why the content area of focus for this study is on inclusion instructional practices in ELA and mathematics classrooms.

Although there has been much debate regarding the effectiveness of inclusion, little evidence has been provided in support of inclusion regarding high-stakes testing. Because more research is necessary to better understand the full effects of inclusion beyond the positive social interactions of students in these classes, this study is designed for the purpose of measuring the effect of the inclusion program on high-stakes test scores in one middle school in South Carolina. The study focuses on the performance of students enrolled in inclusion classes in general education English Language Arts (ELA) and mathematics. The research question to be answered in this study is; what is the effect of inclusion education delivery model on the performance of SWDs and regular education students?

Conceptual Framework

The education of all students in inclusive settings, and the subsequent assessment of student learning in such environment, is the conceptual framework on which this study is based. Katz and Mirenda (2002) expressed that inclusion is the preferred method of delivery for special education curriculum in order to meet both the academic and social needs of SWDs and support inclusion as a way to promote the development of skills in academic areas as well as in non-academic areas such as communication and other "functional life skills" (p. 14). Guralnick (1990) found a positive correlation between the effect of inclusive education and the development of social and academic competences in SWDs.

Hypothesis

The authors hypothesized that SWDs who are enrolled in inclusive ELA and mathematics classes will perform at an achievement level consistent with the general student population of the school.

Review of Relevant Literature

The delivery of instruction with SWDs can take many forms. Two most common instructional delivery methods are: mainstreaming, and inclusion (Stout, 2001). Mainstreaming, also called the "consulting teacher model" (Idol, 2006, p.78), places SWDs in the a general education classroom where the special education (SPED) teacher works directly with SWDs in a general education setting. Another method of mainstreaming is to have SWDs attend general education classes while also separate receiving instruction through a resource pull-out program. In this scenario the general education and SPED teachers collaboratively design a plan for assisting the student in transferring learning from the resource program to the general education setting (Idol, 2006, p. 78).

In inclusion classrooms, both the general and the SPED teachers co-

plan and the curriculum and instruction and co-teach seamlessly in the same class to both SWDs and general education students at the same time. They work collaboratively as partners who are fully vested in the education of the all the students in the classroom regarding delivery of instruction, assessment, and accountability (Friend, 2008, p. 9). The inclusion of SWDs in a general education classroom setting is intended to improve educational outcomes for all students in the inclusive setting (Harr-Robins, Song, Hurlburt, Pruce, Danielson, Garet, & Taylor, 2012, p. ix).

Providing all students with the least restrictive environment while assessing student achievement are both legislatively mandated in most states. This study seeks to shed some light on the effect of inclusion instructional practice, on the performance of both SWDs and regular education students who are co-taught in inclusive instructional settings, on high-stakes test at a middle school.

I.
Method

The study is a quantitative non-experimental post-facto design with high-stakes test scores, as the dependent variable drawn from previous Palmetto Assessment of State Standards (PASS) tests administered in May of each school year. The data is limited to mathematics and ELA scores. These are the two content areas that are tested yearly in South Carolina for middle school students and for which inclusion instructional approach is the practice. Scores are taken from existing data from a two-year period beginning with the 2011-2012 school year to 2012-2013 school year. These scores are accessible from a database maintained by the school district and state department of education, and were obtained accordingly. Students who have received instruction in inclusive classrooms, in ELA and Mathematics, over a two academic-year period covering 2011-2013 were the sample for this study.

The scores of SWDs students were compared to scores of regular education students in the two subject areas (mathematics and ELA) thought in the inclusion settings to determine if the achievement level of the SWDs differs significantly from that of regualr education students. Tests of differences between the mean scores of SWDS and regular education students were performed at 95% CI and $p = 0.05$ using SPSS-PAWS Statistic Version 18.0.

Study Limitations

The small number of subjects within each sample group were less than 30. This presents a limitation to the nature of the statistical analysis approach used and the generalizability of the results. This was why Leven's Test for Homogeneity of Variance (LTHV) was performed to test for

equality of variances despite the slighly small sample size. The test confirmend homogenity and that smaple size does not signisficalty alter the inferences form the analysis. Hence, the study is generalizable to the student population in inclusion education program at the study school.

Assumption

The degree of collaboration between special education and general education teachers and the nature of the interaction of the teachers with the sample students, were assumed to be consistent throughout the two years covered by this study.

Data analysis Method

Analysis were done using SPSS-PASW Statistics, Version 18.0 statistical software. Independent t-tests were performed for the mathematics data, and a Univariate Analysis of Variance (UANOVA) was performed for the English Language Arts (ELA) scores.

Results

Mathematics

The results of the analysis of mathematics scores, over the two-year period, are shown in Tables 1 and 2. The mean of mathematics scores for the inclusion class was slightly higher in 2012-2013 (600.79) than in 2011-2012 (589.38). This is an indication of improved performance overall. However, the difference was not statistically significant at $\alpha = 0.05$, $t_{(52)} = -1.140$, $p > 0.05$ (see Table 1).

Table 1: Descriptive Group and Inferential Statistics for Mathematics across the Two Years of Study

Descriptive Group Statistics by Year Dependent Variable: Score				
Year	**Sample Size N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
2011-2012	26	590.38	37.08	7.27
2012-2013	28	600.79	29.83	5.64

Inferential: Independent Samples Test by Year								p> 0.05	
	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	1.482	.229	-1.14	52	.260	-10.40	9.12	-28.72	7.91
Equal variances not assumed			-1.13	48.02	.264	-10.40	9.20	-29.90	8.10

As shown in Table 2 below, the mean score of students in the regular education mathematics class (623.88) was higher than that of the inclusion class (610.21). The difference was not statistically significant at $\alpha = 0.05$, $t_{(47)} = 1.582$, $p > 0.05$.

Table 2: Score Comparison of Students in Regular Mathematics Classroom with those in Inclusive Classroom

Descriptive Group Statistics by Instruction Grouping in Mathematics				
MATH Study Group	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Regular Ed Class	25	623.88	25.69	5.14
Inclusion Class	24	610.21	34.36	7.01

Independent Samples t-Test								p> 0.05	
	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	2.628	.112	-1.582	47	.120	-13.68	8.64	-3.72	31.06
Equal variances not assumed			-1.572	42.57	.123	-13.67	8.69	-3.87	31.21

English Language Arts (ELA):

The analysis of the scores from inclusive ELA classrooms were done by combining across-year and across-student-instructional-grouping simultaneously using a Univariate Analysis of Variance (UNOVA) approach. See table 3 below.

The mean score of SWDs in ELA in 2012-2013 (597.17) was slightly higher than the mean score of SWDs in ELA in 2011-2012 (591.10). This indicates an improvement. The performance of regular education students was very similar across the two year period (2011-2012 mean = 622.47; 2012-2013 mean = 624.12). These results were not statistically significant at $\alpha = 0.05$, $F_{(50)} = 3.06$, $p > 0.05$. However, the comparison of mean scores between the special ed (594.13) and regular ed (623.29) students in the inclusive ELA setting was statistically significant at $\alpha = 0.05$, $F_{(50)} = 174.42$, $p < 0.05$.

Table 3: Descriptive and Inferential Statistics of the Mean Differences of Student Performance in ELA

Descriptive Group Statistics by Year and Instruction Grouping in ELA
Dependent Variable: Score

Year	Class-group	Mean	Std. Error	95% Confidence Interval	
				Lower	Upper
2011-2012	Regular Ed Class	622.47	8.93	604.53	640.40
	Inclusion Class	591.10	10.94	569.14	613.07
2012-2013	Regular Ed Class	624.12	8.39	607.27	640.96
	Inclusion Class	597.17	9.98	577.12	617.22

UANOVA: Tests of Means Between Subjects Effects
Dependent Variable: Score

Source		Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Year	Hypothesis	192.868	1	192.868	3.055	.331	.753	3.055	.111
	Error	63.137	1	63.137					
Class-group	Hypothesis	11012.593	1	11012.593	174.423	.048	.994	174.423	.700
	Error	63.137	1	63.137					
Year vs. Class-group	Hypothesis	63.137	1	63.137	.053	.819	.001	.053	.056
	Error	59794.065	50	1195.881					

a. Computer using alpha = .05

Discussion

The purpose of the study is to determine the effect of inclusion, as a special education instructional delivery model, on the performance of SWDs and regular education students in Mathematics and ELA in a middle school. The results support the hypothesis that special education students enrolled in inclusive general ELA and mathematics classes perform at an achievement level consistent with the regular education students.

The results of this study indicate that there is no significant difference in performance of SWDs and regular education students overall, except for English language where the perforamnec of regular education students are signifcantly higher that those of SWDs in inclusive setting. Students are enrolled in these classes in order to receive special education services within an environment that is as much like the educational experience of regular education students while still meeting the individual needs of all the students. Inclusion did not have any significant negative effect on the performance of regular education students in an inclusive setting. However, the significant difference between the performance of regular education and SWDs in the ELA inclusion class is revealing. SWDs may be more likely to experience difficulty in ELA than in mathematics classes; since mathematics is a more process-driven subjact than ELA.

Conclusion

The findings of this study tend to support utilizing inclusion as an appropriate and beneficial instructional delivery model for meeting the unique needs of SWDs as well as regular education students. The concern that this model is detrimental to the performance of the regular education students in the inclusion class, is not supported by the findings of this study. This is evident in the lack of a significant difference in performance between the SDWS in the inclusion class and students in regular education class taught by the same set of inlusive instruction co-teachers.

Implications for Practice

The findings of this study support the need for continuation of the current inclusive model of special education instrutional delivery at the study school. The concern that the needs of the SWDs are not being met in the inclusion setting and that the setting may be detrimental to the performance of regular education students is not supported by the findings of this study.

The finsings als have implications for school leadership in terms of planning and scheduling of instructional delivery and services. In schools with SDWs, inclusion classrooms may be the performance-effective option for instructional scheduling format. Similar studies at other schools and studies of the effect of other instructional delivery models, such as comparing students in self-contained programs with other instructional formats is also called for from the finding of this study.

Although, the purpose of the study is to determine the effect of inclusion, as a special education instructional delivery model, the results of the study may be used to plan for subsequent special education instructional delivery programs at the study school or to plan for similar studies at other schools.

References:

Cawelti, G. The side effects of NCLB. *Educational Leadership, 64*(3), 64-68, 2006.

Friend, M. Co-teaching: A simple solution that isn't simple after all. *Journal of Curriculum and Instruction*. *2*(2), 9-19, 2008.

Guralnick, M. J. Social competence and early intervention.. *Journal of Early Intervention, 14*(1), 3-14. 1990

Harr-Robins, J., Song, M., Hurlburt, S., Pruce, C., Danielson, L., Garet, M., and Taylor, J.

The Inclusion of Students With Disabilities in School Accountability Systems (NCEE 2012-4056). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. 2012.

Horowitz, S. Success in the general education curriculum. *NCLD*. 2013. Retrieved December 2, from http://www.ncld.org/students-disabilities/ld-education-teachers/success-general-education-curriculum

Idol, L. Toward inclusion of special education students in general education: A program

evaluation of eight schools. *Remedial and Special Education, 27,* 77-94. 2006.

Katz, J., & Mirenda, P.. Including students with developmental disabilities in general

education classrooms: Educational benefits. *International Journal of Special Education, 17*(2), 14-24. 2002

Sapon-Shevin, M. Inclusive education, high stakes testing and capitalist schooling. *Monthly Review*. 2011. Retrieved January 9, 2014, from http://monthlyreview.org/2011/07/01/inclusive-education-high-stakes-testing-and-capitalist-schooling..

Stout, K. S. Special education inclusion. 2001. *Wisconsin Education Association Council*.

Retrieved from http://www.weac.org/Issues_Advocacy/Resource_Pages_On_Issues_one/Special_Education/special_education_inclusion.aspx. December 2, 2013.

U.S. Department of Education *Thirty-five years of progress in educating children with disabilities through IDEA*. Office of Special Education and Rehabilitative Services Report (pp. 1-120. Washington, DC. 2010.