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Does Access Matter? Time in General Education and Achievement for Students With Disabilities

Meghan Cosier, PhD[1], Julie Causton-Theoharis, PhD[2] and George Theoharis, PhD[2]

Abstract

This study examined the relationship between hours in general education and achievement in reading and mathematics for students with disabilities. The study population included more than 1,300 students between the ages of 6 and 9 years old within 180 school districts. Hierarchical linear modeling (HLM) was utilized with the Pre-Elementary Education Longitudinal Study (PEELS) data set (Institute of Education Sciences). The relationship between hours in general education and achievement in reading and mathematics was explored while accounting for student- and district-level factors. Results suggest a strong positive relationship between the number of hours students spent in general education and achievement in mathematics and reading. Implications for policy and practice in special education are presented and discussed.

Keywords

access to general education contexts, special education, achievement, hierarchical linear modeling

Despite a long history of advocacy for inclusion of students with disabilities in general education classrooms (Turnbull, Stowe, & Huerta, 2007) and research suggesting the benefits of access to general education contexts (e.g., Daniel & King, 1997; Mastropieri et al., 1998; McDonnell et al., 2003; Stevens & Slavin, 1995; Waldron & McLeskey, 1998), large numbers of students with disabilities continue to learn in separate educational settings (Data Accountability Center, 2010). Recent data on the exclusion of students with disabilities indicate approximately 50% of students with disabilities spend a significant amount of time learning outside the general education classroom and these rates of exclusion have remained relatively consistent over the past 10 years (Data Accountability Center, 2010). These statistics are evidence that special education policy implementation is grounded in the assumption that educating students with disabilities in separate settings is typical practice for many children, despite the body of research suggesting students with disabilities benefit academically and socially from being educated alongside their peers without disabilities. Thus, this current landscape of special education indicates the need to further research relationships between access to general education contexts, achievement, and related economic and demographic factors.

Access to General Education Contexts and Inclusion

To many stakeholders in K-12 education, *access to general education contexts* and *inclusion* are not synonymous, and therefore, it is imperative to clarify the terms used in this article. Access to general education contexts means students with disabilities are provided with meaningful opportunities to access general education curriculum in general education classrooms with instruction provided by a general education teacher (Ryndak, Moore, Orlando, & Delano, 2008–2009). However, scholars and practitioners have defined inclusion as not simply practices, but a belief system in which all students feel as if they belong and are a meaningful part of the classroom community (Falvey & Givner, 2005). Thus, inclusive education goes beyond simply access to general education contexts. For the purpose of

[1]Chapman University, Orange, CA, USA
[2]Syracuse University, NY, USA

Corresponding Author:
Meghan Cosier, Chapman University, 1 University Drive, Orange, CA 92866, USA.
Email: cosier@chapman.edu

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this study, the authors use the term *access to general education contexts* to define the access students receive to the general education classroom each week. Although many classrooms might also be philosophically and practically inclusive, this study does not explore these beliefs and practices. We argue that although in this study we do not look at the practices and beliefs of teachers or the classroom community, access to general education contexts is a necessary and essential foundation to authentic practices of inclusive education.

Access to General Education Contexts and Achievement

Scholars have approached empirical research on the efficacy of educating students with disabilities in general education contexts from a variety of perspectives. The focus of a range of studies has been on students with disabilities (e.g., Marston, 1996; Rea, McLaughlin, & Walther-Thomas, 2002), students without disabilities (e.g., Gandhi, 2007), and students with and without disabilities (e.g., Waldron & McLeskey, 1998). Many of these studies examined aspects of student performance such as social skills (Fryxell & Kennedy, 1995; Vaughn, Moody, & Schumm, 1998) or academic achievement in reading, written language, or mathematics (e.g., Rea et al., 2002; Vaughn et al., 1998; Waldron & McLeskey, 1998). For example, Waldron and McLeskey (1998) found students with mild and severe learning disabilities made more progress in reading and math when they were included in general education classrooms. Other studies assessed student performance as perceived by teachers and parents (e.g., Fisher, Pumpian, & Sax, 1998), and found that parents and teachers consider inclusive education an important factor in student achievement. Similarly, a meta-analysis of work in this area indicated most studies suggested positive or neutral outcomes for students with and without disabilities, with only a small number of studies indicating poor outcomes for students with and without disabilities (Kalambouka, Farrell, Kaplan, & Dyson, 2005).

Important research on access to general education contexts has also been conducted using large, nationally representative data sets. Large data sets can serve as an important data source for educational researchers because they allow for strong external validity and statistical power (Thomas & Heck, 2001). Studies using large data sets, including the Special Education Elementary Longitudinal Study (SEELS) and the National Transitional Longitudinal Study 2 (NLTS2), have indicated mostly positive outcomes for students with disabilities included in general education classrooms, with some notable areas that suggested neutral or poor outcomes when students with disabilities were educated alongside their peers without disabilities. For example, Blackorby, Schiller, Knokey, and Wagner (2007) examined the relationship between achievement and access to general education classrooms for students with disabilities represented in the SEELS data set and found that students with greater access to general education classes typically scored higher on academic measures than students with less access. However, multivariate analyses indicated no differences in long-term academic outcomes for students who spent more time in general education classes. Similarly, Wagner, Newman, Cameto, Levine, and Garza (2006) found that although high school students represented in the NLTS2 data set experienced increased academic outcomes from accessing general education classrooms, this access was also a predictor of student dropout. Results from these studies illustrate the complexity of teasing out factors related to access to general education contexts and achievement of students with disabilities.

Intersectionality

Economic and demographic factors are among the complex factors associated with access to general education contexts for students with disabilities (De Valenzuela, Copeland, Qi, & Park, 2006; Donovan & Cross, 2002; Hosp & Reschly, 2004). Researchers are recognizing and representing the complex relationships between special education and factors such as race/ethnicity, language, and gender (e.g., De Valenzuela et al., 2006; Donovan & Cross, 2002; O'Connor & Deluca Fernandez, 2006). Students with and without disabilities are positioned within complex social situations and this should be acknowledged by researchers (Artiles, Kozleski, Waitoller, & Lukinbeal, 2011). References to these complex social systems are evident in the work of Donovan and Cross (2002), who acknowledged the existence of strong relationships between race, socioeconomic status (SES), and special education practices, and are further examined by scholars such as Ferri and Connor (2005), who highlighted the intersectionality of race and segregated special education practices. This complexity came into play in the quantitative research of Hosp and Reschly (2004) as they recognized connections between race and placement in special education. Without a doubt, we must acknowledge the role that language and race play in special education (Donovan & Cross, 2002).

In addition to language, race, and gender, researchers must take into account SES when evaluating student learning (Nieto, 2009). Poverty affects the educational achievement of all children in the United States (Berliner, 2009). This is especially true for students with disabilities, as studies have suggested a relationship between SES and achievement (Coutinho & Oswald, 1998), as well as referral and assessment procedures (Coutinho, Oswald, & Best, 2002). To properly interrogate the relationship between practice

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and policy and achievement of students with disabilities, it is imperative to account for all of these key variables.

Conceptual Framework

Although many studies related to access to general education contexts and achievement contain valid and reliable results, there are areas where the complex nature of the relationship between access to general contexts and achievement needs to be studied in greater detail. A majority of studies in this area tend to have relatively small sample sizes ranging from 4 (McDonnell, Johnson, Polychronis, & Risen, 2002) to 240 (Marston, 1996) when dealing with analyses at the student level (as opposed to data aggregated to the district level). More research is needed using larger samples of students. In addition, prior research in this area often did not account for the multiple levels of social systems at play such as school- or district-level factors. Moreover, inquiry accounting for race, language, gender, and disability could contribute to the current body of research in meaningful ways.

The current study adds to the research base by examining the relationship between achievement and access to general education contexts while accounting for economic and demographic factors. Although this relationship has been studied in a variety of ways, the full complexity is still not entirely understood. Schools and districts continue to educate students with disabilities in segregated settings at high rates, reflecting a clear need for further inquiry. We sought to examine the relationship between access to general education contexts and achievement while addressing limitations in previous research and adding a fresh perspective of how variables are constructed. This study was based on the hypotheses that more access to general education contexts would be positively related to achievement in mathematics and reading, and that socioeconomic and demographic variables would account for variance in achievement. Based on these hypotheses, we established the following research questions:

Research Question 1: What is the relationship between hours per week included in the general education classroom and the reading achievement of students with disabilities when also accounting for student- (e.g., age, race, gender, SES, language, prior achievement, and disability) and district-level factors (e.g., racial composition of district and district SES)?

Research Question 2: What is the relationship between hours per week included in the general education classroom and the mathematics achievement of students with disabilities when also accounting for student- (e.g., age, race, gender, SES, language, prior achievement, and disability) and district-level factors (e.g., racial composition of district and district SES).

Method

Participants

Participants in this study were derived from a sample of approximately 3,100 children, labeled with disabilities, between the ages of 3 and 9 years old and nested within 270 school districts. This study includes a cross section of 1,300 students who were between the ages of 6 and 9 years old ("elementary school age") during the fourth wave of data collection nested within 180 school districts. The data on these participants were collected through the Pre-Elementary Longitudinal Study (PEELS) funded by the U.S. Department of Education Office of Special Education Programs (OSEP), now funded through the National Center for Special Education Research in the Institute of Education Sciences. Westat is the contractor hired to collect and maintain the data. Westat began collecting data on children with disabilities between the ages of 3 and 5 in 2003 and then repeated data collection in 2005, 2006, and 2007 (subsequent data were gathered in 2009 and were not included in this study). Individuals from the data set were included in this analysis based on having complete demographic and achievement data. Therefore, this cross section included 1,300 individuals without missing data (approximately 1,200 for item nonresponse, 500 for unit nonresponse, and 100 for nonparticipation in the academic assessments).

All participants in the analysis for this article were age 6 or older during the 2007 academic school year and labeled as having one of the federal categories of disability covered under Individuals With Disabilities Education Act (IDEA), or additional categories including (a) suspected of having a disability, (b) being at risk for a disability, (c) "other," and (d) "child does not have an Individualized Education Program (IEP)." The latter category indicates either the child was (a) declassified as having a disability or (b) was determined ineligible to receive special education services and was being served via Section 504 of the Rehabilitation Act (1973). Children 6 years and older were chosen to represent elementary school–age children as opposed to children in early childhood settings.

Dependent Variables

The dependent variables in this study were chosen to represent reading and mathematics achievement. Although participants were given multiple measures of achievement, the Applied Problems and Letter-Word Identification subtests of the *Woodcock–Johnson III Tests of Academic Achievement* (*WJ-III*; Woodcock, McGrew, & Mather, 2001) were the only tests given consistently to all participants each year. Therefore, they are able to serve as an accurate measure of progress from Wave 2 (2005) to Wave 4 (2007) in math and reading, respectively. The Wave 2 standard scores (at or above 131 = very superior,

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Table 1. Means and Standard Deviations of Variables.

Variable	*M*	*SD*	Minimum	Maximum
Reading achievement	92.12	27.34	0	143
Math achievement	90.03	29.44	0	157
Hours in GE	24.37	11.60	0	40
Age (Wave 2)	67.65	9.51	48	87
Gender	0.29	0.46	0	1
Language	0.20	0.40	0	1
Hispanic	0.21	0.41	0	1
Black	0.12	0.32	0	1
Student SES	8.48	3.56	1	12
At risk/disability	0.28	0.45	0	1
Prior achievement: Reading	92.86	31.11	0	192
Prior achievement: Math	85.48	30.82	0	152
District race (% minority)	32.29	27.41	0	100
District SES	2.13	0.91	1	4

Note. GE = general education; SES = socioeconomic status.

121–130 = superior, 111–120 = high average, 90–110 = average, 80–89 = low average, 70–79 = low, 69 or below = very low; Mather & Woodcock, 2001) are used as an independent variable and can accurately take into account a student's prior achievement.[1] The Wave 4 standard scores are used as the outcome variable. The means and standard deviations of the dependent variables (and the independent variables) can be found in Table 1.

Independent Variables

Student-level (Level 1) independent variables. The independent variables chosen for this study were hours in general education, prior achievement (described above), age, gender, language, race, SES, and disability label (see Table 1). They were selected on the basis of empirical research documenting relationships with special education services and achievement of students with disabilities. Access to general education contexts was the target independent variable in this study. Access to general education contexts was measured by the average number of hours per week each student spent in general education during Waves 2, 3, and 4. This time spent ranged from 0 to 40 hr per week in the general education classroom. Age was calculated in months at the time of Wave 4 assessment. Gender was a dichotomous variable, which indicated whether the student was male or female (female = 1, male = 0). Language indicated whether the participant spoke a language other than English. The race variables were dummy variables that included Black and Hispanic students (compared with all other races, with a majority of the other participants identifying as Caucasian). We chose these variables based on previous research suggesting high levels of exclusion for Black and Hispanic students (Donovan & Cross, 2002). Student SES was represented by parent income, which included 12 income levels (1 = US$0–US$5,000; 2 = US$5,001–US$10,000; 3 = US$10,001–US$15,000; 4 = US$15,001–US$20,000; 5 = US$20,001–US$25,000; 6 = US$25,001–US$30,000; 7 = US$30,001–US$35,000; 8 = US$35,001–US$40,000; 9 = US$40,001–US$45,000; 10 = US$45,001–US$60,000; 11 = US$60,000–US$75,000; 12 = US$75,000+). In addition, interaction terms of race and hours in general education were also used. To take into account prior reading and math achievement, the Wave 2 scores on the same assessments are included as an independent variable.

In addition to factors such as race and SES, it is important to take disability label into consideration when discussing opportunities to access general education contexts. Current statistics on the placement of students with disabilities indicate certain groups of students with disabilities are more often placed in separate settings (Data Accountability Center, 2010). These groups included students with labels of multiple disabilities, deaf-blindness, mental retardation, emotional disturbance, visual impairment, hearing impairment, and autism. Therefore an "at risk for segregation" variable was how disability was defined in this research. This variable was referred to as *at risk for segregation/disability* (at risk for segregation/disability = 1, not at risk for segregation/disability = 0) where the students with disability labels mentioned above who were more likely to be educated in separated educational settings were coded as 1 and students who do not have those labels were coded as 0. This decision was made because "Disability" is not static or fixed and there are many social influences at work in terms of labeling and placing individuals with disabilities along the continuum of services. This variable was intended to more accurately represent the social influences of "disability" not modeled by a traditional disability label variable.

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Table 2. Bivariate Correlation of Level 1 Independent Variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1	.051*	.022	.041*	−.005	−.010	.002	.013	.024	.040*	−.005	.041
2. Hours in GE		1	−.054**	−.072**	−.09**	.100**	.087*	−.434**	.606**	.519**	.658**	.593**
3. Hispanic			1	.620**	−.087**	−.174**	.033	.000	−.107**	−.066**	−.076**	−.041**
4. Language				1	−.054**	.464**	−.012	.027	−.126**	−.069**	−.089**	−.044*
5. Black					1	−.236**	.021	.060**	−.126**	−.054**	−.114**	−.075**
6. SES						1	−.046*	−.107**	.164**	.155*	.187**	.184**
7. Age							1	.024	.046*	−.046*	.073**	−.206**
8. Disability								1	−.424**	−.369**	−.475**	−.459**
9. Prior achievement: Math									1	.854**	.854**	.735**
10. Prior achievement: Reading										1	.762**	.764**
11. Math achievement											1	.849**
12. Reading achievement												1

Note. GE = general education; SES = socioeconomic status.
*Correlation is significant at the .05 level (two-tailed).
**Correlation is significant at the .01 level (two-tailed).

Establishing the *at risk for segregation/disability* variable as a dichotomous dummy variable allowed the researcher to assess the differences in relationships of the outcome variable and the two groups.

District-level (Level 2) independent variables. The influence of district-level variables of race/ethnicity and percentage of students receiving free or reduced-price lunch (hereafter referred to as district SES) of the district has been indicated in multiple research studies on special education–related processes (Donovan & Cross, 2002; Hosp & Reschly, 2002). Race/ethnicity was a scale variable ranging from 0% to 100% and district SES was a nominal variable ranging from 1 to 4 (1 = 0%–25%; 2 = 25%–50%; 3 = 51%–75%; 4 = 76%–100%). These variables were included in this study to assess their contribution or interaction with student-level variables and the dependent variables. Furthermore, the PEELS data contain limited information on district information regarding policy or capacity to include students with various disabilities in elementary school. Therefore, we used available demographic data represented in Table 1.

Procedures and Implementation

This study utilized data from the direct one-to-one assessments, demographic data collected from parent interviews, information regarding hours spent in general education gathered from parent interviews and teacher surveys, and district demographic information from local education agency (LEA) surveys from the PEELS data set. Longitudinal child assessments weights were applied to generate results that account for sampling (Carlson, Posner, & Lee, 2008). In the analyses section, moderately and highly significant bivariate correlations are highlighted and discussed. Then, the results of the hierarchical linear modeling (HLM) analyses are reported.

Analyses

Bivariate Analyses

Bivariate analyses were conducted to assess the correlations among the variables. Exploring these correlations assisted us in the decision-making process of including and excluding appropriate variables. This included a correlation analysis of Level 1 and Level 2 variables (see Tables 2 and 3, respectively). This analysis indicates that some variables used in the study correlate with each other. Hours in general education correlated negatively ($p < .01$) with *at risk for segregation/disability*, and positively with prior reading and prior mathematics achievement, reading achievement, and math achievement. Being Hispanic was correlated positively ($p < .01$) with language other than English. Language other than English correlated positively ($p < .01$) with student SES. However, because not all individuals who spoke a language other than English were Hispanic, we chose not to exclude either variable. *At risk for segregation/disability* correlated negatively ($p < .01$) with prior reading and mathematics achievement, and current reading and mathematics achievement. As these individuals typically have more significant disabilities, this correlation was not surprising. Prior mathematics and reading achievement correlated positively ($p < .01$) with current mathematics and reading achievement, respectively. Thus, our assumptions of the relationship between prior achievement and current achievement were verified. The Level 2 variables of district race and SES correlated positively ($p < .01$) with each other. However, because previous research indicates that these variables might have differential influences on student achievement and disability placement (Donovan & Cross, 2002; Hosp & Reschly, 2002), we chose not to exclude either variable due to correlation.

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Table 3. Bivariate Correlation of Level 2 Independent Variables.

	1	2
1. District percentage of minority students	1	.625**
2. District SES	.625**	1

Note. SES = socioeconomic status.
**Correlation is significant at the .01 level (two-tailed).

HLM

The final step in this process was conducting the analysis using HLM6 software (Raudenbush & Bryk, 2002; Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004). Prior to running the analysis with Level 1 predictors, an analysis with a null model (a model without any predictors), was run to assess variability between districts. This analysis was then used to calculate the intraclass correlation coefficient (ICC). The ICC allowed us to assess the variability among school districts. When using HLM software, the null model was run by creating an equation where achievement was identified as the outcome variable and no Level 1 or Level 2 predictors were added to the equation. Next, two HLM analyses were run for reading achievement. The first was run with only Level 1 predictors and the second was run with Level 1 predictors, Level 2 predictors, and interaction terms. The same method was used for mathematics achievement.

Results

First, a null model for each outcome variable was run to assess variability among school districts. This ICC was calculated for the reading and math performance outcome variables. This model contained only the dependent variable and a random intercept. The ICC for reading achievement of .066 means that 6.6% of the variability of reading achievement was accounted for by districts. Likewise, the ICC of .079 meant that 7.9% of the variability of math achievement was accounted for by districts. This indicated a modest amount of variability within districts does exist. Therefore, we felt this justified the use of HLM as the method of analysis.

Reading Achievement

Results of the analysis for reading achievement including Level 1 predictor variables are presented in Table 4. Hours in general education were significant ($p < .001$) with a coefficient .49, suggesting that for each hour spent in general education, students scored half a point higher on the reading assessment. For example, a student who spent 0 hr in general education might achieve a standard score of 95 on the reading assessment. When all other Level 1 factors are accounted for, if the same student spent 30 hr per week in general education, the student's score on the reading assessment section would be approximately 111.2. Age was significant ($p < .001$) with a coefficient of −.40. Student socioeconomic status was significant ($p < .05$) with a coefficient of .47. Prior reading achievement was also significant ($p < .001$) with a coefficient of .56.

Results from the analysis with Level 1 predictors, Level 2 predictors, and interaction terms are shown in Table 4, and indicated that hours spent in general education classrooms was significant ($p < .001$) with a slope coefficient of .50. Generally, for every 1 hr spent in general education, the average student in the population increased approximately half a point on the reading achievement test. Age (in months) accounted for a significant amount of variance ($p < .001$) with a slope coefficient of −.39. Student SES was significant ($p < .05$) with a coefficient of .37. The mean student SES was 8.5 out of 12. An 8.5 represents an income in the range of US$30,001 to US$35,000 per year. This suggests that for each unit above US$30,000 to US$35,000 (e.g., US$35,001–US$40,000), the participant's score increased about a quarter of a point. Prior achievement was significant at the $p < .001$ level with a coefficient of .56.

District SES was significant ($p < .01$) with a coefficient of −1.97. This can be interpreted as the influence of SES across districts on the participants' mean reading achievement. These results indicated students in districts above the mean of 2.18 (a 3 or a 4 on the scale) or districts with 50% to 75% of the students receiving free or reduced-price lunch scored 1.93 points lower than students in districts with less than 50% of students receiving free or reduced-price lunch, and students in districts with more than 75% of the students receiving free or reduced-price lunch scored about 3.3 points lower than students with the mean of 25% to 50% students in the district receiving free or reduced-price lunch.

Mathematics Achievement

Results of the analysis with mathematics achievement incorporating only Level 1 predictors are displayed in Table 4. Hours in general education were significant ($p < .001$) with a coefficient of .37 indicating that each hour participants spent in general education was associated with a

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Table 4. Results of MLM Analyses for All Models.

Variable	Reading L1 predictors coefficient	Reading L1, L2, and interaction coefficient	Math L1 predictors coefficient	Math L1, L2, and interaction coefficient
Intercept	53.66	33.43	28.08	24.83
District SES		−1.97**		−1.37*
% minority in district		0.033		0.008
Hours in GE	0.492**	0.503**	0.370**	0.374**
Hispanic	0.983	1.00	−0.57	−0.20
Black	−3.84	−2.89	−1.05	−0.09
Language other than English	0.703	0.713	0.034	0.569
Age	−0.40**	−0.39**	0.006	0.007
Gender	0.009	−0.03	−0.3	−1.33
Disability	−5.06**	−3.85	−3.3	−1.14
Student SES	0.471**	0.37**	0.45**	0.368**
Prior achievement	0.056**	0.56**	0.70**	0.718**
Black × Hours in GE		−0.26		−0.22
Hispanic × Hours in GE		0.05		−0.08
Disability × Hours in GE		0.153		0.255

Note. MLM = multilevel modeling; L1 = Level 1 predictor variable; L2 = Level 2 predictor variables; interaction = interaction terms; SES = socioeconomic status; GE = general education.
*$p < .05$. **$p < .01$. ***$p < .001$.

.37 increase in standard scores on the mathematics achievement test. Student SES was significant ($\beta = .37$, $p < .001$). In addition, prior achievement was also significant ($p < .001$) with a coefficient of .69.

Results of the analysis with mathematics achievement and all predictors are displayed in Table 2. Hours in general education was significant at the $p < .001$ level with a slope coefficient of .374. Student SES was significant ($p < .01$) with a slope coefficient of .37. In addition, prior achievement was significant ($\beta = .718$, $p < .001$).

Discussion

The results of this study provide a unique contribution to the body of research on the complex issue of access to general education contexts and achievement of students with disabilities. Our hypotheses that a significant relationship exists between time spent in general education contexts and achievement in reading and mathematics was confirmed by the findings. Notably, slight increases in standard scores were related to increased time spent in general education classrooms. In addition, control variables including student SES, age, and district SES were related to the outcome variables of reading and mathematics achievement.

A positive relationship between reading and mathematics achievement and increased access to general education contexts supports previous research suggesting students with disabilities often achieve more when they are afforded the opportunity to learn in general education classrooms. Although the coefficients for reading and mathematics (.50 and .37, respectively) suggest a slight increase in standard scores with each hour spent in general education, these results should be considered within the context of a 35-hr school week. For example, "Student A" and "Student B" are both students with disabilities being supported under IDEA. Student A is included in a general education setting for only 2 hr each day (10 hr per week) for science and social studies instruction. The rest of Student A's day is spent in a self-contained classroom. Student B spends 6 hr each day (30 hr per week) learning in a general education classroom. When all other factors are controlled (e.g., race, gender, age, disability), we can conclude that on average, Student B may increase his or her score in reading and math approximately 8 to 10 points more than Student A. These differences in achievement scores might equate to significant differences in reading and math skills of students.

In addition to the significant relationship between access to general education contexts and achievement, the significance of control variables was also noteworthy. The significance of these variables at the student and district levels is a perfect illustration of the importance of using theoretical and statistical models that represent complex social systems at work. The significance of student SES as an indicator of increased reading achievement supports previous literature indicating that SES has some bearing on student achievement (Caldas & Bankston, 1997). Likewise, the negative relationship between reading and mathematics achievement and district SES is supported by previous research indicating a significant relationship between district SES and student achievement (Coutinho & Oswald, 1998).

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With regard to disability labels and significance of disability, it must be noted that school districts and schools across the country have widely different rates of exclusion and inclusion of students based on severity of disability (Data Accountability Center, 2010). For example, some districts might have policies of attempting to include all students with autism into general education classrooms, whereas other districts might have established a practice or program of educating students with autism in self-contained classrooms. Therefore, although not significant in this study, disability label may moderate the relationship between hours in general education and achievement in different ways depending on the policies at the district and school level regarding students with various disabilities. In addition, because some students with more significant disabilities did not participate in the academic assessments and were not included in the analysis, we must be careful not to generalize these results to that population.

Implications for Practice

The finding that students with disabilities achieve higher scores in reading and mathematics with more time spent in general education certainly justifies teachers and administrators taking a look at current classroom, school, and district practices related to access to general education contexts for students with disabilities. Researchers have found that evaluating policies and practices that create social and academic inequities, and subsequently changing those policies and practices to consider equity for all students, leads to increases in achievement for students with and without disabilities (Frattura & Capper, 2007). Implementing policies that support access to general education contexts such as moving from a continuum of placements model to a continuum of services model, where services are provided to students with disabilities in general education contexts as much as possible before considering a separate placement, represents a critical step in increasing opportunities for students with disabilities to learn with peers without disabilities (Frattura & Capper, 2007). In addition, addressing mechanisms that drive differences related to access to general education contexts may support students with disabilities in successfully accessing the general education curriculum. Ultimately, evaluating how policies and practices promote or hinder the academic success of students with disabilities is of utmost importance.

Equally important is considering policies and practices in classrooms. Although the findings from this study point to higher achievement for students with disabilities when they can access general education contexts, the daily classroom practices that support this achievement require an in-depth evaluation. We hypothesize a significant amount of disparity existed between classrooms in regard to the use of practices related to successful inclusion for students with disabilities such as differentiating instruction (Tomlinson, 2003). Consequently, it is possible instructional strategies affected the achievement of students with disabilities. Similarly, we suspect practices such as peer modeling and use of instructional approaches such as universal design for learning affected students' academic achievement. For example, researchers have noted students with disabilities can more easily access the curriculum in inclusive classrooms when these practices and strategies are implemented (Rose & Meyer, 2006). This may be especially true for students with more significant learning difficulties (Wehmeyer, Lance, & Bashinski, 2002).

Limitations

Limitations in this study include measures of achievement, access to general education contexts, missing data, and district-level variables. Student achievement can and should be measured in many different ways. In this study, achievement is defined by reading and mathematics scores. Follow-up studies should include various measures of achievement, including social/behavioral achievement. Access to general education contexts is a broad term and can carry a variety of meanings (Ryndak et al., 2008–2009). A limitation of the construct of the independent variable of access to general education in this study is that it did not account for the many school and classroom factors associated with the quality of inclusion. The PEELS data set contained data for more than 3,000 participants. Due to missing data, including demographic data and availability of test scores from multiple years, only about half of participants were used in this study.

Conclusion and Future Research

Special education policy and practice are complex and interrelated with other entities, and findings from this study represent only a portion of the research needed in the area of access to general education contexts and achievement. As such, research examining these relationships using various measures of achievement and control variables is needed. Moreover, future research should focus on classroom, school, and district policies and practices that influence the access to general education. Most importantly, this study calls researchers and practitioners to consider the need for promoting quality general education contexts for all students.

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Note

1. Wave 2 test scores were used instead of Wave 1 test scores due to more participants with complete test score data in Wave 2.

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